



**TŘINECKÉ ŽELEZÁRNY**

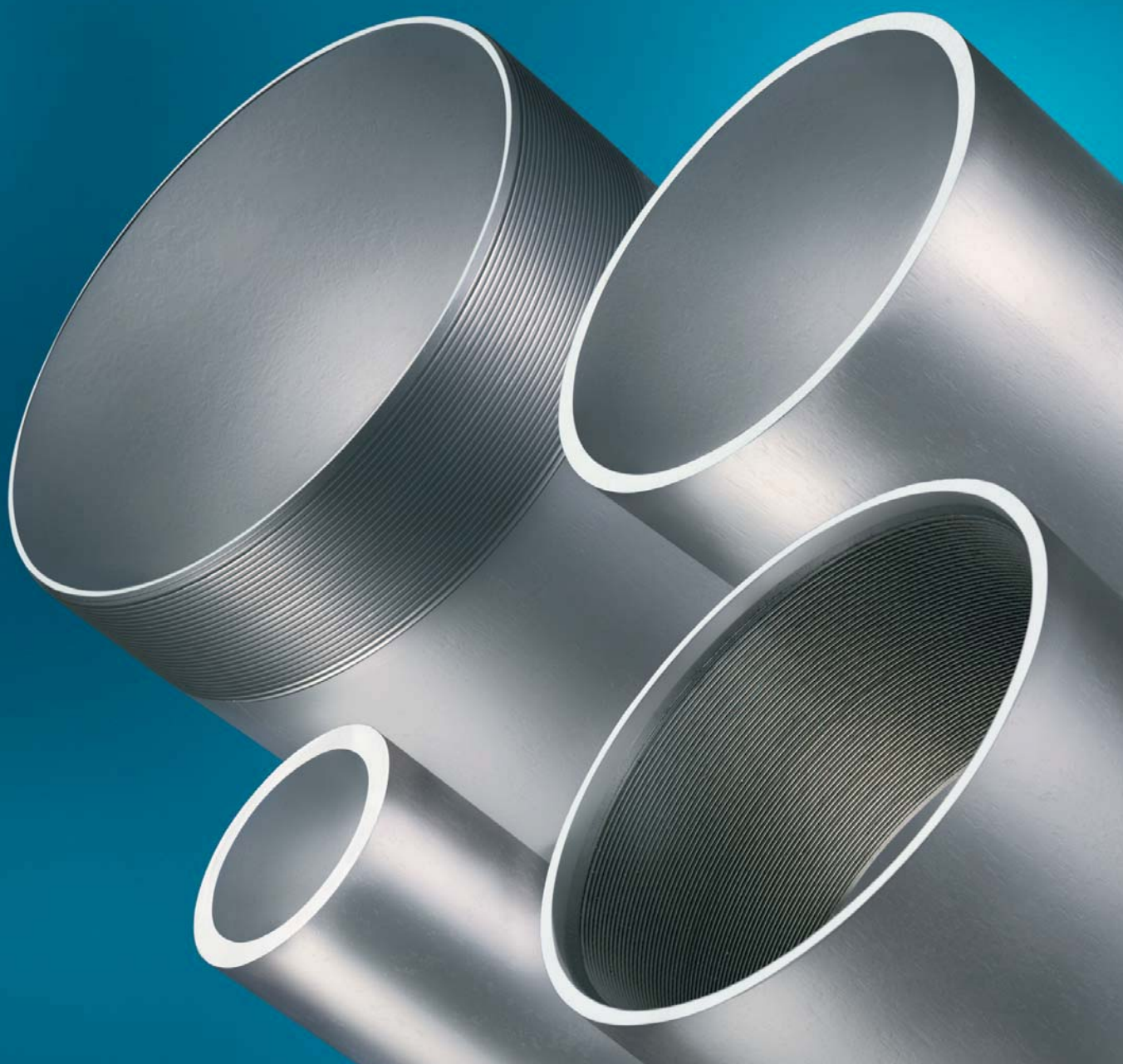


**MORAVIA STEEL**

**OCELOVÉ BEZEŠVÉ TRUBKY, VÝROBNÍ PROGRAM**

**SEAMLESS STEEL TUBES, PRODUCTION PROGRAM**

**NAHTLOSE STAHLROHRE, PRODUKTIONSPROGRAMM**



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## PROFIL SPOLEČNOSTI

První trubka v železářských podnicích bývalé Rakousko-Uherské monarchie byla vyrobena v roce 1883 v naší společnosti. Motivem pro zavedení výroby trubek, nejdříve ovšem svařovaných, byl prudký vzrůst jejich potřeby související s rozvojem parních kotlů, výstavbou vodovodů, plynovodů a potřeby trubek pro těžbu ropy, s možností využití moderní ocelářské základny. Výrobu bezešvých trubek jsme zavedli v roce 1896. V roce 1908 byl zaveden Stiefelův výrobní proces, za osobní účasti vynálezce.

Naše firma se tak stala první evropskou rourou, užívající tuto zcela moderní technologii. V letech 1918 – 1925 byly uvedeny do provozu 2 válcovací tratě typu Mannesmann. Od roku 1999 se stala válcovna trub samostatnou akciovou společností. V roce 2005 jsme se stali členem skupiny podniku TRINECKÉ ŽELEZÁŘNY, a. s. – MORAVIA STEEL a. s. S účinností ke dni 31. 8. 2010 došlo k fúzi sloučením nástupnické společnosti TRINECKÉ ŽELEZÁŘNY, a. s. se zanikající společností VÁLCOVNA TRUB TŽ, a. s., která byla její 100 % dceřinou společností.

## COMPANY PROFIL

The very first tube in the Austro-Hungarian Monarch had been manufactured in our company in 1883. Welded at first, the specialised tube production was inspired by the rocketing demand generated by the fast spreading use of steam boilers, by the construction of water and gas supply systems, by the developing oil exploitation, as well as by the potential of a modern steel making company. Seamless tubes were introduced in 1896 and the Stiefel technology started under personal supervision of the inventor himself in 1908.

Our company thus became the Europe's first seamless tube manufacturer using then the state-of-the-art technology. In the period between 1918 and 1925 two Mannesmann rolling mills had started. In 1999 the tube mill became a joint-stock company with its self-legal subjectivity. We have been a member of the group TRINECKÉ ŽELEZÁŘNY – MORAVIA STEEL since 2005. A corporate consolidation of the successional company TRINECKÉ ŽELEZÁŘNY, a. s. and the dissolving company VÁLCOVNA TRUB TŽ, a. s. took place on 1<sup>st</sup> September 2010. Mill's assets

## PROFIL DER GESELLSCHAFT

Das erste Rohr in Eisenhüttenbetrieben der damaligen österreichisch-ungarischen Monarchie wurde im Jahre 1883 in unserer Gesellschaft hergestellt. Das Motiv für die Einführung der Produktion von Rohren, zuerst jedoch von geschweißten Rohren, wurde das heftige Anwachsen ihres Bedarfs im Zusammenhang mit der Entwicklung von Dampfkesseln, mit dem Aufbau von Wasserleitungen, Gasrohrleitungen sowie mit dem Bedarf von Rohren für die Erdölgewinnung, mit der Ausnutzungsmöglichkeit der modernen Stahlwerkbasis. Die Fertigung von nahtlosen Rohren haben wir im Jahre 1896 eingeführt. Im Jahre 1908 wurde unter persönlicher Anwesenheit des Erfinders der Stiefelfertigungsprozess eingeführt.

Unsere Gesellschaft ist hiermit das erste europäische Rohrwalzwerk geworden, die diese hochmoderne Technologie verwendet hat. In den Jahren 1918 – 1925 wurden die Mannesmann-Walzstraßen in Betrieb genommen. Seit 1999 wurde das Rohrwalzwerk eine selbständige Aktiengesellschaft. Wir sind Mitglied



Společnost VTTŽ zanikla bez likvidace ke dni 31. 8. 2010 a její majetek a závazky přešly na společnost TŽ.

Dnes jsou v provozu 2 Mannesmannovy tratě, jejichž výrobní program tvoří ocelové bezešvé trubky průměru 60,3 až 406,4 mm s tloušťkou stěny 6,3 mm a výše z ocelí nelegovaných i legovaných. Výroba bezešvých trubek ve válcovnách trub je charakteristická propracovanou technologií výroby širokého sortimentu ocelí a rozsáhlého rozměrového sortimentu dle norem API, ASTM, DIN, EN, NFA, ČSN aj.

#### Nejčastější využití naší produkce spadá do oblastí:

|                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------|
| strojírenství, stavebnictví,                                                                                                      |
| výstavba produktovodů,                                                                                                            |
| automobilový průmysl,                                                                                                             |
| výroba energetických zařízení,                                                                                                    |
| chemický průmysl,                                                                                                                 |
| dominantní postavení mají olejářské trubky Casing 9 5/8" – 13 3/8" a Line Pipe 6 5/8" – 16" pro těžbu ropy, zemního plynu a vody. |

Dle požadavků odběratelů atestujeme mechanické vlastnosti, chemické složení, hodnocení a dokumentaci metalografické struktury materiálu. Provádíme nedestruktivní zkoušení rozptylovými toky, ultrazvukem a magnetickou práškovou metodou.

and liabilities were passed over to the company TŽ.

Two Mannesmann rolling mills work today to put out seamless tubes in diameters ranging from 60,3 mm to 406,4 mm and wall thickness starting at 6,3 mm using alloy or carbon steel for raw materials. Today's rolling mill production uses sophisticated technology to manufacture a wide selection of tubes in terms of size and steel grade, that conforms with foreign standards such as API, ASTM, DIN, EN, NFA or with the Czech ČSN standards.

#### Our tubes are mainly used in the following fields:

|                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| engineering, construction,                                                                                                                                     |
| oil, gas or product pipelines,                                                                                                                                 |
| automotive industry,                                                                                                                                           |
| power generating installations,                                                                                                                                |
| power-supply units and systems production,                                                                                                                     |
| dominating to our production program are 9 5/8" – 13 3/8" Casing and 6 5/8" – 16" Line Pipe applicable in oil and gas exploitation and geological prospecting. |

Materials are tested on mechanical properties, chemical composition and metallographic structures with comply of customers request. Non-destructive testing is conducted using techniques such as eddy current, flux leakage, ultrasonic, magnetic particle or wetting fluorescent.

der Betriebsgruppe von TŘINECKÉ ŽELEZÁRNY, a. s. – MORAVIA STEEL a.s. seit 2005. Mit Wirkung vom 31.8.2010 zu einer Fusion durch die Vereinigung der Nachfolgesellschaft TŘINECKÉ ŽELEZÁRNY, a. s. mit der eingehenden Gesellschaft VTTŽ kommen wurde, die ihre 100% Tochtergesellschaft war. Die Gesellschaft VTTŽ wurde zum 31.8.2010 ohne Liquidierung eingehen und ihr Eigentum und Verpflichtungen wurden unter die Gesellschaft TŽ übergehen.

Heutzutage sind im Betrieb zwei Mannesmann-Walzstraßen, wobei das Herstellungsprogramm dieser Straßen nahtlose Stahlrohre bilden, mit dem Durchmesser von 60,3 bis 406,4 mm und mit der Wanddicke von 6,3 mm, hergestellt aus unlegierten sowie legierten Stählen. Die Herstellung von nahtlosen Rohren in den Rohrwalzwerken ist durch eine durchgearbeitete Fertigungstechnologie eines breiten Stahlsortimentes sowie eines breiten Abmessungssortimentes nach den API-, ASTM-, DIN-, EN-, ČSN-Normen und nach anderen Normen charakteristisch.

#### Die häufigste Ausnutzung unserer Produktion fällt in folgende Bereiche:

|                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maschinenbau, Bauwesen                                                                                                                                            |
| Aufbau von Produktleitungen                                                                                                                                       |
| Automobilindustrie                                                                                                                                                |
| Herstellung von energetischen Einrichtungen                                                                                                                       |
| Chemische Industrie                                                                                                                                               |
| Eine dominante Stellung nehmen die Ölfeldrohre Casing 9 5/8" – 13 3/8" sowie Ölleitungsrohre Line Pipe 6 5/8" – 16" für die Erdöl-, Gas- und Wassergewinnung ein. |

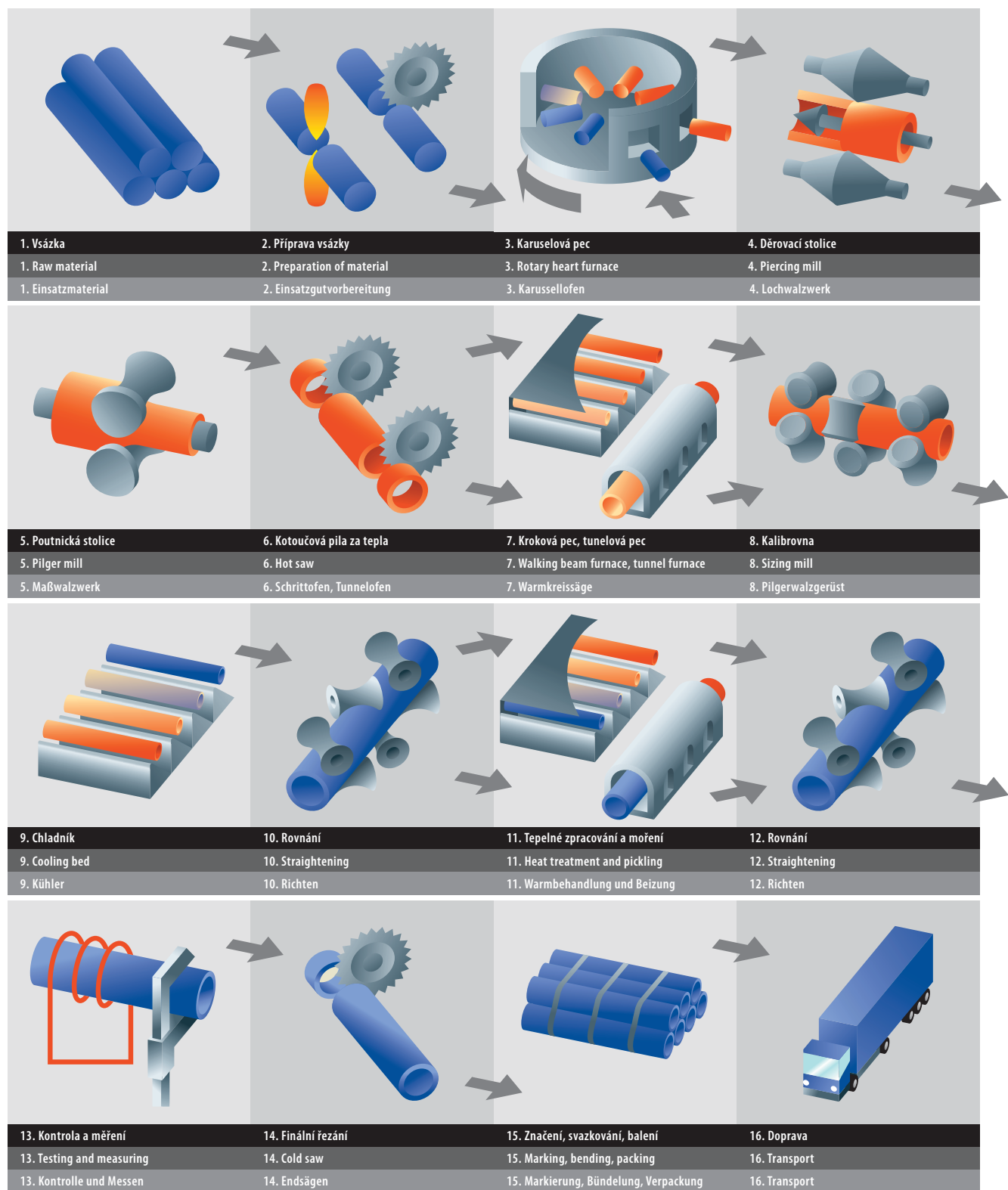
Nach den Abnehmerforderungen attestieren wir mechanische Eigenschaften, chemische Zusammensetzung, Bewertung und Dokumentierung des metallgraphischen Werkstoffgefüges. Wir führen zerstörungsfreie Prüfungen durch Streufluss, Ultraschall sowie Magnetpulververfahren durch.

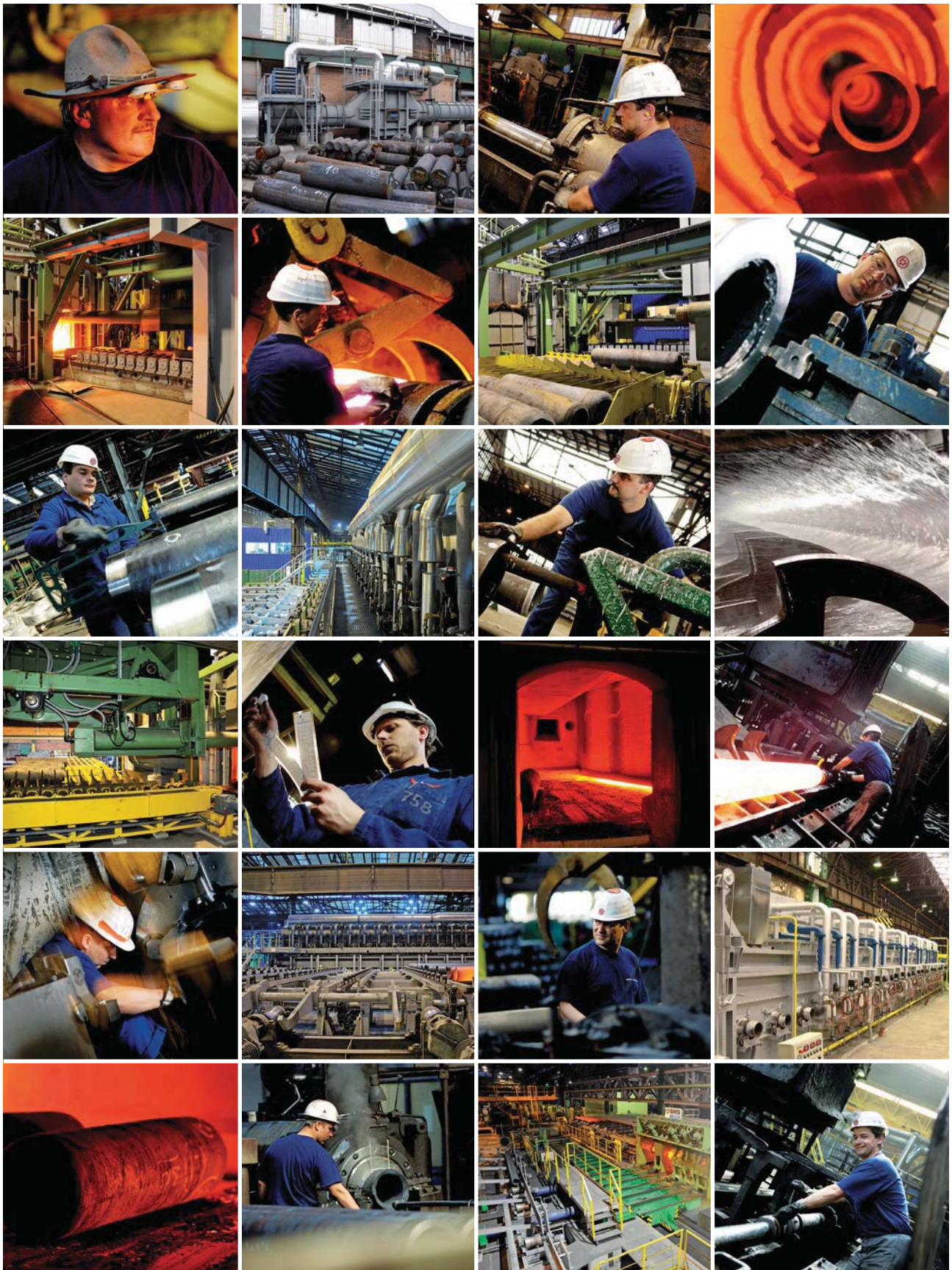


## VÝROBNÍ SCHÉMA

## PRODUCTION SCHEME

## PRODUKTIONSSCHEMA



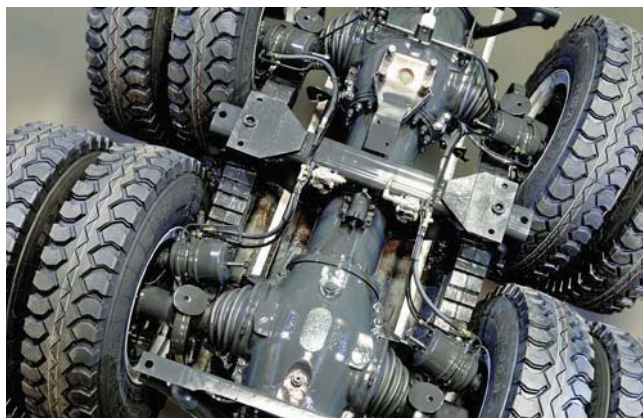




## REFERENCE

## REFERENCES

## REFERENZEN



| Obor, odvětví             | Způsob použití                                                                                                                                                                                                                                                | Konkrétní příklad                                                                              |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Area, industry            | Application                                                                                                                                                                                                                                                   | Specific example                                                                               |
| Fachgebiet                | Anwendungszweck                                                                                                                                                                                                                                               | Konkretes Beispiel                                                                             |
| AUTOMOBILOVÝ PRŮMYSL      | nápravy a rámy nákladních automobilů, obráběné polotovary pro automobilky                                                                                                                                                                                     | Tatra, Liaz, trolejbusy Škoda, VW, DAF, BMW, Mercedes, Fiat, Hitachi                           |
| AUTOMOTIVE                | axles and frames of trucks, trolleybuses, machined semi products for automobile producers.                                                                                                                                                                    | Trucks Tatra, Liaz, trolleybuses Škoda, VW, DAF, BMW, Mercedes, Fiat, Hitachi                  |
| AUTOMOBILINDUSTRIE        | Lastwagenachsen und Rahmen, zu bearbeitende Halberzeugnisse für Autowerke                                                                                                                                                                                     | Tatra, Liaz, O-Busse Škoda, VW, DAF, BMW, Mercedes, Fiat, Hitachi                              |
| STROJÍRENSTVÍ             | otočná a pevná kola (kladky) pro přepravní prostředky a přístroje, obaly satorů, rámy a nárazníky nákladních železničních vagónů, tiskárenské válce, papírenský průmysl, rámy a vodící kladky vysokozdvizných vozíků, statory elektromotorů, výložníky jeřábů | Wicke Zlín, TATRAVAGÓNKA Poprad, PAPCEL Litovel, MEZ Nedvědice pro projekt JULI, Terrex-Peiner |
| MACHINERY AND ENGINEERING | rotary and fixed wheels (tackles) for transport machines and equipment, covers of stators, stators of electro motors, frames and buffers of the railway freight cars, printing shop rolls, frames and guide rollers of the high lift trucks, crane arms.      | Wicke Zlín, TATRAVAGONKA Poprad, PAPCEL Litovel, MEZ Nedvedice for project JULI, Terrex-Peiner |
| MASCHINENBAU              | Dreh- und Festräder (Rollen) für Transportmittel und Geräte, Statorverpackungen, Lastwagenrahmen und Stossstangen, Druckereiwalzen, Papierindustrie, Rahmen und Leitrollen der Gabelstapler, Elektromotorenstadtohre, Kranausleger                            | Wicke Zlín, TATRAVAGÓNKA Poprad, PAPCEL Litovel, MEZ Nedvědice für Projekt JULI, Terrex-Peiner |



| Obor, odvětví             | Způsob použití                                                                                                                                                                                                                                             | Konkrétní příklad                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Area, industry            | Application                                                                                                                                                                                                                                                | Specific example                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Fachgebiet                | Anwendungszweck                                                                                                                                                                                                                                            | Konkretes Beispiel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| STAVEBNICTVÍ              | mikropiloty, mikrozápory a injektáže pro výstavbu metra, tunelů, rekonstrukcí budov, výstavbu dálnic a mostů, struskovody pro teplárny, výstavba produktovodů, trakční stožáry a vybavení železničních koridorů, konstrukce                                | Metro Praha, Strahovský tunel, rekonstrukce historické budovy Tylova divadla v Praze, klášter Františkánů v Brně, klášter v Rajhradě, Počeradý, Žilina, trať z Čáslavi do Kralup n.V., plynofikace ČR a SR, horská dráha v Buffalo, USA, horská dráha Eldorado v Madridu, Millenium Dome v Londýně, letištní hala v Lipsku, odbavovací hala letiště v Kolíně n.R., nádraží ve Frankfurtu n.M., německý pavilon pro EXPO 2000 v Hannoveru, pavilon v výstaviště Brno, zastřešení olympijského stadiónu v Berlíně, víceúčelová hala SAZKA ARÉNA v Praze, obchodní domy MAKRO, závod VW v Bratislavě, mezinárodní letiště Ruzyně a hypermarket Olympia Brno-Modřice, univerzitní kampus Brno-Bohunice                                                                                                                     |
| BUILDING AND CONSTRUCTION | micro-piles, micro-braces and grouting, highways piling and bridge pylons, poles, undergrounds, tunnels, historical buildings reconstructions, highway and bridges, pipelines, railway corridors, steel constructions                                      | mountain track in Buffalo USA, mountain track Eldorado in Madrid Spain, Central part of the Millennium Dome London UK, departure hall in Leipzig airport and departure hall in Koeln am Rhein airport, roof of the Berlin Olympic stadium, railway station building in Frankfurt am Mein, German stand EXPO 2000 in Hannover Germany, Metro Praha, Strahov tunnel, reconstruction of the Tyl's theater in Prague, Franciscan Monastery in Brno, Monastery in Rajhrad, Pocerady, Zilina, pipeline from Caslav to Kralupy n.V., gas distribution of Czech and Slovak Republics, hall V in exhibition ground Brno, supermarkets MAKRO, VW Facility in Bratislava Slovakia, international airport Ruzyne and hypermarket Olympia Brno-Modřice, multipurpose hall SAZKA ARENA in Prague, university campus in Brno-Bohunice |
| BAUWESEN                  | Mikropiloten, Mikroeingriffe und Injektionen für U-Bahn- und Tunnelbau, Baurekonstruktionen, Autobahn- und Brückenbau, Schlackenleitungen für Heizkraftwerke, Aufbau der Produktleitungen, Traktionsmaste und Eisenbahnkorridorausstattung, Konstruktionen | U-Bahn Praha, Tunnel in Strahov, Rekonstruktion des historischen Gebäudes Tyl's Theater in Prag, Franziskaner Kloster in Brno, Kloster in Rajhrad, Počeradý, Žilina, Eisenbahnstrecke von Čáslav nach Kralupy n.V., Gaseinführungsarbeiten in ČR und SR, Achterbahn in Buffalo, USA, Achterbahn Eldorado in Madrid, Millenium Dome in London, Flughafenhalle in Leipzig, Abfertigungshalle Flughafen Köln am Rhein, Bahnhof in Frankfurt am Main, deutscher Pavillon EXPO 2000 in Hannover, Pavillon Messe Brno, Bedachung des Olympiastadions in Berlin, Mehrzweckhalle SAZKA ARÉNA in Prag, Kaufhäuser MAKRO, VW Betrieb in Bratislava, internationales Flughafen Ruzyně und Hypermarket Olympia Brno-Modřice, Universitätscampus Brno-Bohunice                                                                      |



| Obor, odvětví                                                   | Způsob použití                                                                                                                                             | Konkrétní příklad                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Area, industry                                                  | Application                                                                                                                                                | Specific example                                                                                                                                                                                                                                                                                                                               |
| Fachgebiet                                                      | Anwendungszweck                                                                                                                                            | Konkretes Beispiel                                                                                                                                                                                                                                                                                                                             |
| CHEMICKÝ PRŮMYSL                                                | rafinerie ropy                                                                                                                                             | Slovnaft Bratislava, rekonstrukce rafinerie v Turkmenbaši                                                                                                                                                                                                                                                                                      |
| CHEMICAL INDUSTRY                                               | petrol refinery                                                                                                                                            | Slovnaft Bratislava, refinery in v Turkmen-bash                                                                                                                                                                                                                                                                                                |
| CHEMIEINDUSTRIE                                                 | Erdölraffinerie                                                                                                                                            | Slovnaft Bratislava, Rekonstruktion der Raffinerie in Turkmenbash                                                                                                                                                                                                                                                                              |
| TĚŽBA ROPY, ZEMNÍHO PLYNU<br>A GEOLOGICKÝ PRŮZKUM               | trubky pro podzemní zásobníky plynu,<br>tlakové stanice ropovodů, centrální<br>tankoviště ropy a pro těžbu ropy, plynu<br>a vody                           | podzemní zásobníky plynu Dolní Bojanovice a Uhřice, centrální tankoviště ropy<br>v Kralupech, dodávky pro TOTAL, TEXACO, ESSO, ELF, AGIP, ÖMV, SPC, ONGC, dodávky<br>pro offshore platformy do Vietnamu, OCTG do USA                                                                                                                           |
| OIL, GAS AND WATER<br>EXPLOITATION AND<br>DISTRIBUTION, GEOLOGY | underground gas storage, pressure oil<br>stations, central oil storage stations                                                                            | Underground gas storage Dolni Bojanovice and Uhřice, central oil tanking station in<br>Kralupy, supplies for TOTAL, TEXACO, ESSO, ELF, AGIP, ÖMV, SPC, ONGC, supplies for<br>offshore platforms to Vietnam, OCTG to the USA                                                                                                                    |
| ERDÖL-, ERDGASFÖRDERUNG<br>UND GEOLOGISCHE<br>FORSCHUNG         | Rohre für Gasuntergrundspeicher,<br>Druckstationen der Erdölleitungen, zentrale<br>Erdölförderanlage und für Erdöl-, Gas- und<br>Wasserrförderung          | Gasuntergrundspeicher Dolni Bojanovice und Uhřice, zentrale Erdölförderanlage in<br>Kralupy, Lieferungen für TOTAL, TEXACO, ESSO, ELF, AGIP, ÖMV, SPC, ONGC, Lieferungen<br>für offshore Plattformen in Vietnam, OCTG in die USA                                                                                                               |
| ENERGETICKÉ STROJÍRENSTVÍ                                       | elektrárny a teplárny – trubky pro parovody<br>a komory k jejich rekonstrukcím a výstavbě<br>nových elektráren a tepláren                                  | Šen-tou, Strongoli, Staro Beševo, Kolubara, plynová elektrárna Jebel Ali – dodávky<br>pro Hyundai, Saúdská Arábie a součásti zařízení jaderných elektráren Dukovany,<br>Temelín, Paks, Mochovce, Dětmarovice, elektráren a tepláren Vojany, Vřesová, Tušimice,<br>Chvaletice, Energocentrum Kladno, Škoenergo-Ml.Boleslav, Zlín                |
| POWER GENERATION<br>MACHINERY                                   | slag-lines for the power and heating plants,<br>piping and collectors for the power stations<br>overhauls and construction                                 | Shen-Tou, Strongoli, Staro Beschevo, Kolubara, gas power plant Jebel Ali – supplies for<br>Hyundai, Saudi Arabia, nuclear power plants in Dukovany, Temelin, Paks, Mochovce,<br>Detmarovice, power plants and heating facilities Vojany, Vresova, Tusimice, Chvaletice,<br>Energocenter Kladno, Skoenergo-Ml. Boleslav, Zlin                   |
| ENERGIEMASCHINENBAU                                             | Kraftwerke und Heizkraftwerke – Rohre<br>für Dampfleitungen und Kammern für ihre<br>Rekonstruktionen und für Aufbau neuer<br>Kraftwerke und Heizkraftwerke | Šen-tou, Strongoli, Staro Beševo, Kolubara, Gaskraftwerk Jebel Ali – Lieferungen für<br>Hyundai, Saudi Arabien und Einrichtungseinzelteile der Kernkraftwerke Dukovany,<br>Temelin, Paks, Mochovce, Dětmarovice, der Kraftwerke und Heizkraftwerke Vojany,<br>Vřesová, Tušimice, Chvaletice, Energocentrum Kladno, Škoenergo-Ml.Boleslav, Zlín |



## VÝROBKOVÉ PORTFOLIO | PRODUCT ASSORTMENT | PRODUKTPORTFOLIO

|                                                                                                                     |                                                                                                             |                                                                                                                                 |                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
|                                                                                                                     |                                                                                                             |                                                                                                                                 |                                                                                                       |
| Kontislitky různých průřezů<br>Continuously cast rounds, blooms and billets<br>Stranguss verschiedener Querschnitte | Bloky<br>Blooms<br>Blöcke                                                                                   | Bramy<br>Slabs<br>Brammen                                                                                                       | Sochory<br>Billets<br>Knüppel                                                                         |
|                                                                                                                     |                                                                                                             |                                                                                                                                 |                                                                                                       |
| Železniční kolejnice<br>Railway rails<br>Eisenbahnschienen                                                          | Příslušenství pro železniční svršek<br>Railway superstructure accessories<br>Zubehör für Gleisoberbau       | Trubky bezešvé<br>Seamless tubes<br>Nahtlose Rohre                                                                              | Šestihranná ocel<br>Hexagonal steel<br>Sechskantstahl                                                 |
|                                                                                                                     |                                                                                                             |                                                                                                                                 |                                                                                                       |
| Úhelníky<br>Angles<br>Winkelisen                                                                                    | Plochá ocel<br>Flat steel<br>Flachstahl                                                                     | Čtvercová ocel<br>Squares<br>Vierkantstahl                                                                                      | Kruhová ocel ve svitcích a tyčích<br>Round steel in coils and bars<br>Rundstahl in Wickeln und Stäben |
|                                                                                                                     |                                                                                                             |                                                                                                                                 |                                                                                                       |
| Široká ocel<br>Wide steel<br>Breitstahl                                                                             | Pružinové pásy se žebrem a drážkou<br>Spring strip with a rib and groove<br>Federbänder mit Rippe und Rille | Valcovaný drát<br>Wire rod<br>Walzdraht                                                                                         | Betonářská ocel<br>Rebars<br>Betonstahl                                                               |
|                                                                                                                     |                                                                                                             |                                                                                                                                 |                                                                                                       |
| Loupaná tyčová ocel<br>Bright bars<br>Geschälter Stabstahl                                                          | Ocel kruhového průřezu tažená za studena<br>Cold drawn round bars<br>Rundquerschnittstahl kaltgezogen       | Tyčová ocel čtvercová a plochá tažená za studena<br>Cold drawn square and flat bars<br>Vierkant- und Flachstabstahl kaltgezogen | Šrouby<br>Screws<br>Schrauben                                                                         |
|                                                                                                                     |                                                                                                             |                                                                                                                                 |                                                                                                       |
| Pružiny<br>Springs<br>Feder                                                                                         |                                                                                                             |                                                                                                                                 |                                                                                                       |



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|----------------------------------------|-----------------------------------------|-----------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM | SEAMLESS STEEL TUBES PRODUCTION PROGRAM | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |
| PŘEHLED POUŽÍVANÝCH NOREM              | REVIEW OF APPLICABLE STANDARDS          | ÜBERSICHT DER VERWENDETEN NORMEN        |
| Technické dodací podmínky              | Technical delivery conditions           | Technische Lieferbedingungen            |

## PŘEHLED POUŽÍVANÝCH NOREM

### TECHNICKÉ DODACÍ PODMÍNKY

## REVIEW OF APPLICABLE STANDARDS

### TECHNICAL DELIVERY CONDITIONS

## ÜBERSICHT DER VERWENDETEN NORMEN

### TECHNISCHE LIEFERBEDINGUNGEN

| EVROPSKÉ NORMY                                                                                                                                    | EUROPEAN STANDARDS                                                                                                          | EUROPÄISCHE NORMEN                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| EN 10 208-2                                                                                                                                       |                                                                                                                             |                                                                                                                                       |
| Ocelové trubky pro dálková potrubí pro hořlavé kapaliny a plyny                                                                                   | Steel pipes for pipelines for combustible fluids                                                                            | Stahlrohre für Fernrohrleitungen für brennbare Flüssigkeiten und Gase                                                                 |
| EN 10210-1, 2                                                                                                                                     |                                                                                                                             |                                                                                                                                       |
| Duté profily tvářené za tepla z nelegovaných a jemnozrnných konstrukčních ocelí                                                                   | Hot finished structural hollow sections of non-alloy and fine grain structural steels                                       | Warmgefertigte Hohlprofile für den Stahlbau aus unlegierten Baustählen und aus Feinkornbaustählen                                     |
| EN 10 216-1                                                                                                                                       |                                                                                                                             |                                                                                                                                       |
| Bezešvé ocelové trubky pro nádoby a zařízení – trubky z nelegovaných ocelí se zaručenými vlastnostmi při okolní teplotě                           | Seamless steel tubes for pressure purposes – non-alloy steel tubes with specified room temperature properties               | Nahtlose Stahlrohre zu Druckzwecken – aus unlegierten Stählen mit garantierten Eigenschaften unter Raumtemperaturen                   |
| EN 10216-2                                                                                                                                        |                                                                                                                             |                                                                                                                                       |
| Bezešvé ocelové trubky pro tlakové nádoby a zařízení – trubky z nelegovaných a legovaných ocelí se zaručenými vlastnostmi při zvýšených teplotách | Seamless steel tubes for pressure purposes – non-alloy and alloy steel tubes with specified elevated temperature properties | Nahtlose Stahlrohre zu Druckzwecken – aus unlegierten und legierten Stählen mit garantierten Eigenschaften bei höheren Temperaturen   |
| EN 10216-3                                                                                                                                        |                                                                                                                             |                                                                                                                                       |
| Bezešvé ocelové trubky pro tlakové nádoby a zařízení – trubky z legovaných jemnozrnných ocelí                                                     | Seamless steel tubes for pressure purposes – alloy fine grain steel tubes                                                   | Nahtlose Stahlrohre zu Druckzwecken – aus legierten Feinkornstählen                                                                   |
| EN 10216-4                                                                                                                                        |                                                                                                                             |                                                                                                                                       |
| Bezešvé ocelové trubky pro tlakové nádoby a zařízení – trubky z nelegovaných a legovaných ocelí se zaručenými vlastnostmi při nízkých teplotách   | Seamless steel tubes for pressure purposes – non-alloy and alloy steel tubes with specified low temperature properties      | Nahtlose Stahlrohre zu Druckzwecken – aus unlegierten und legierten Stählen mit garantierten Eigenschaften bei niedrigen Temperaturen |
| EN 10297-1                                                                                                                                        |                                                                                                                             |                                                                                                                                       |
| Bezešvé ocelové trubky kruhového příčného průřezu pro strojírenství a všeobecné použití – trubky z nelegovaných a legovaných ocelí                | Seamless circular steel tubes for mechanical and general engineering purposes                                               | Nahtlose kreisförmige Rohre für Maschinenbau und für allgemeine technische Verwendung – Rohre aus unlegierten und legierten Stählen   |

|                                        |                                         |                                         |                                                                                    |
|----------------------------------------|-----------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM | SEAMLESS STEEL TUBES PRODUCTION PROGRAM | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |  |
| PŘEHLED POUŽÍVANÝCH NOREM              | REVIEW OF APPLICABLE STANDARDS          | ÜBERSICHT ÜBER VERWENDETEN NORMEN       |                                                                                    |
| Technické dodací podmínky              | Technical delivery conditions           | Technische Lieferbedingungen            |                                                                                    |

| NĚMECKO                                                                     | GERMANY                                                                                   | DEUTSCHLAND                                                                               |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| DIN 1629                                                                    |                                                                                           |                                                                                           |
| Bezešvé kruhové trubky z nelegovaných ocelí se speciálními požadavky        | Seamless circular carbon steel tubes with special quality requirements                    | Nahtlose Rohre aus unlegierten Stählen mit Spezialanforderungen                           |
| DIN 1630                                                                    |                                                                                           |                                                                                           |
| Bezešvé kruhové trubky z nelegovaných ocelí pro zvlášť vysoké požadavky     | Seamless circular carbon steel tubes with very high quality requirements                  | Nahtlose Rohre aus unlegierten Stählen für besonders hohe Anforderungen                   |
| DIN 17 121                                                                  |                                                                                           |                                                                                           |
| Bezešvé kruhové trubky z běžných konstrukčních ocelí pro ocelové konstrukce | Seamless structural steel circular tubes for structural engineering purposes              | Nahtlose Rohre aus Konstruktionsstählen für Stahlbau                                      |
| DIN 17 172                                                                  |                                                                                           |                                                                                           |
| Ocelové trubky pro dálková potrubí pro hořlavé kapaliny a plyny             | Steel pipe for long-distance pipelines for fuel liquids and gas                           | Stahlrohre für Fernrohrleitungen und den Transport von brennbaren Flüssigkeiten und Gasen |
| DIN 17 173                                                                  |                                                                                           |                                                                                           |
| Bezešvé trubky kruhového průřezu z ocelí houževnatých za studena            | Seamless circular steel tubes for low temperatures                                        | Nahtlose kreisförmige Rohre aus kaltzähnen Stählen                                        |
| DIN 17 175                                                                  |                                                                                           |                                                                                           |
| Bezešvé ocelové trubky ze žárupevných ocelí                                 | Seamless steel tubes for elevated temperatures                                            | Nahtlose Stahlrohre aus warmfesten Stählen                                                |
| DIN 17 176                                                                  |                                                                                           |                                                                                           |
| Bezešvé trubky z ocelí odolných proti vodíku                                | Seamless circular steel tubes for hydrogen service at elevated temperatures and pressures | Nahtlose Rohre aus wasserstoffbeständigen Stählen                                         |
| DIN 17 204                                                                  |                                                                                           |                                                                                           |
| Trubky z ocelí pro zušlechťování                                            | Seamless circular tubes of steel for quenching and tempering                              | Rohre aus Veredelungsstählen                                                              |
| DIN 17 210                                                                  |                                                                                           |                                                                                           |
| Trubky z ocelí pro cementování                                              | Case hardening steel pipe                                                                 | Rohre aus Zementierungsstählen                                                            |



|                                        |                                         |                                         |
|----------------------------------------|-----------------------------------------|-----------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM | SEAMLESS STEEL TUBES PRODUCTION PROGRAM | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |
| PŘEHLED POUŽÍVANÝCH NOREM              | REVIEW OF APPLICABLE STANDARDS          | ÜBERSICHT DER VERWENDETEN NORMEN        |
| Technické dodací podmínky              | Technical delivery conditions           | Technische Lieferbedingungen            |

| USA | USA | USA |
|-----|-----|-----|
|-----|-----|-----|

| API SPEC 5CT                                                                     |                                                                                                            |                                                                                     |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Specifikace pro pažnicové a čerpací trubky                                       | Specification for Casing and Tubing                                                                        | Vorschriften für Casing und Tubing                                                  |
| API SPEC 5L                                                                      |                                                                                                            |                                                                                     |
| Specifikace pro naftovodné trubky                                                | Specification for Line Pipe                                                                                | Vorschriften für Ölfeldrohre                                                        |
| ASTM A 53                                                                        |                                                                                                            |                                                                                     |
| Specifikace pro svařované a bezešvé černé trubky a galvanizované, zinkované      | Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-coated welded and seamless                       | Glatte Stahlrohre                                                                   |
| ASTM A 106                                                                       |                                                                                                            |                                                                                     |
| Specifikace pro bezešvé ocelové uhlíkové trubky pro použití za vysokých teplot   | Specification for Seamless Carbon Steel Pipe for High-Temperature Service                                  | Nahtlose kohlenstoffhaltige Stahlrohre für die Verwendung unter Hochtemperaturen    |
| ASTM A 333                                                                       |                                                                                                            |                                                                                     |
| Specifikace pro bezešvé a svařované ocelové trubky pro použití za nízkých teplot | Standard Specification for Seamless and Welded Steel Pipe for Low-Temperature Service                      | Nahtlose und geschweißte Stahlrohre für den Betrieb unter Niedertemperaturen        |
| ASTM A 335                                                                       |                                                                                                            |                                                                                     |
| Specifikace pro bezešvé feritické legované trubky pro použití za vysokých teplot | Standard Specification for Seamless Ferritic Alloy-Steel Pipe for High-Temperature Service                 | Nahtlose Stahlrohre aus ferritischen Stählen für den Betrieb unter Hochtemperaturen |
| ASTM A 450                                                                       |                                                                                                            |                                                                                     |
| Požadavky na uhlíkové, legované a austenitické ocelové trubky                    | Standard Specification of General Requirements for Carbon, Ferritic Alloy and Austenitic Alloy Steel Tubes | Anforderungen auf kohlenstoffhaltige, legierte und austenitische Stahlrohre         |
| ASTM A 530                                                                       |                                                                                                            |                                                                                     |
| Specifikace pro hlavní požadavky pro speciální uhlíkové a legované trubky        | Standard Specification of General Requirements for Specialized Carbon and Alloy Steel Pipe                 | Allgemeine Anforderungen auf Rohre aus kohlenstoffhaltigen und legierten Stählen    |

| FRANCIE | FRANCE | FRANKREICH |
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| NF A 49 - 112                                                                                     |                                                                                                                                   |                                                                                                       |
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| Bezešvé trubky s hladkými konci válcované za tepla se zaručenými vlastnostmi při normální teplotě | Steel tubes – plain end seamless hot rolled tubes with specified room temperature properties and with special delivery conditions | Nahtlose warmgewalzte Rohre mit glatten Enden mit garantierten Eigenschaften bei normaler Temperatur  |
| NF A 49 - 211                                                                                     |                                                                                                                                   |                                                                                                       |
| Bezešvé trubky s hladkými konci z nelegované oceli pro vedení media zvýšené teploty               | Seamless plain and unalloyed steel tubes for fluid typing at elevated temperatures                                                | Nahtlose Rohre mit glatten Enden aus unlegiertem Stahl für Leitung von Medien mit erhöhter Temperatur |
| NF A 49 - 311                                                                                     |                                                                                                                                   |                                                                                                       |
| Bezešvé trubky z ocelí nelegovaných a legovaných s Mo a Cr-Mo používané při zvýšených teplotách   | Seamless tubes for mechanical application                                                                                         | Nahtlose Rohre für mechanische Verwendung                                                             |

|                                                 |                                                  |                                                  |                                                                                    |
|-------------------------------------------------|--------------------------------------------------|--------------------------------------------------|------------------------------------------------------------------------------------|
| <p> OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM </p> | <p> SEAMLESS STEEL TUBES PRODUCTION PROGRAM </p> | <p> NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM </p> |  |
| <p> PŘEHLED POUŽÍVANÝCH NOREM </p>              | <p> REVIEW OF APPLICABLE STANDARDS </p>          | <p> ÜBERSICHT DER VERWENDETEN NORMEN </p>        |                                                                                    |
| <p> Technické dodací podmínky </p>              | <p> Technical delivery conditions </p>           | <p> Technische Lieferbedingungen </p>            |                                                                                    |

| ČESKÁ REPUBLIKA                                                                                             | CZECH REPUBLIC                                                                      | TSCHECHISCHE REPUBLIK                                                                                         |
|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| ČSN 42 0165                                                                                                 |                                                                                     |                                                                                                               |
| Trubky z feriticko-perlitických ocelí se zaručenými hodnotami vrubové houževnatosti při snížených teplotách | Seamless carbon and alloy-steel tubes for low-temperature services                  | Rohre aus Ferritperlitischen Stählen mit garantierten Kerbschlagzähigkeitswerten bei niedrigeren Temperaturen |
| ČSN 42 0250                                                                                                 |                                                                                     |                                                                                                               |
| Trubky bezešvé z oceli tříd 10 až 16 tvářené za tepla                                                       | Hot-formed seamless carbon and alloy-steel tubes                                    | Nahtlose Rohre aus dem Stahl der Klasse 10 bis 16, warmgewalzt                                                |
| ČSN 42 0251                                                                                                 |                                                                                     |                                                                                                               |
| Trubky ocelové bezešvé se zaručenými vlastnostmi za vyšších teplot                                          | Seamless carbon and alloy-steel tubes for high-temperature services                 | Nahtlose Stahlrohre mit garantierten Eigenschaften unter höheren Temperaturen                                 |
| ČSN 42 0252                                                                                                 |                                                                                     |                                                                                                               |
| Trubky bezešvé z oceli třídy 17                                                                             | Seamless ferritic and austenitic steel tube                                         | Nahtlose Rohre aus dem Stahl der Klasse 17                                                                    |
| ČSN 42 5720                                                                                                 |                                                                                     |                                                                                                               |
| Trubky ocelové bezešvé čtyřhranné tvářené za tepla                                                          | Hot-formed seamless square and rectangular tubes                                    | Nahtlose Vierkantstahlrohre, warmgewalzt                                                                      |
| VN 42 0249                                                                                                  |                                                                                     |                                                                                                               |
| Trubky ocelové bezešvé tvářené za tepla určené k opracování                                                 | Seamless steel hot formed structural tubing for machining                           | Nahtlose Warmgewalzte Stahlrohre, bestimmt zu Bearbeitung                                                     |
| VN 42 0255                                                                                                  |                                                                                     |                                                                                                               |
| Předvalky trubkové ocelové z ocelí tříd 11 až 17                                                            | Mother steel pipe of Gr. 11-17                                                      | Rohrhohlblöcke aus den Stahlklassen 11 bis 17                                                                 |
| VN 42 0256                                                                                                  |                                                                                     |                                                                                                               |
| Trubky ocelové bezešvé tlustostěnné tvářené za tepla z oceli tříd 11 až 16                                  | Hot formed seamless carbon and alloy steel extra strong tubes                       | Nahtlose dickwandige Stahlrohre, warmgewalzt, aus den Stahlklassen 11 bis 16                                  |
| VN 42 5791                                                                                                  |                                                                                     |                                                                                                               |
| Přírubové trubky s dvojitými lemy a točivými přírubami                                                      | Flanged tubes with double borders and rotary flange for PN 16                       | Flanschesrohre mit Doppelrändern und mit Drehflanschen für PN 16                                              |
| VN 42 5792                                                                                                  |                                                                                     |                                                                                                               |
| Trubky přírubové podélně svařované s dvojitými lemy a točivými přírubami pro PN 16                          | Flanged longitudinally welded tubes with double borders and rotary flange for PN 16 | Längsgeschweisste Flanschrohre mit Doppelrändern und mit Drehflanschen für PN 16                              |



|                                        |                                         |                                         |
|----------------------------------------|-----------------------------------------|-----------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM | SEAMLESS STEEL TUBES PRODUCTION PROGRAM | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |
| PŘEHLED POUŽÍVANÝCH NOREM              | REVIEW OF APPLICABLE STANDARDS          | ÜBERSICHT DER VERWENDETEN ROHRE         |
| Rozměrové normy                        | Dimensional standards                   | Massnormen                              |

**ROZMĚROVÉ NORMY****DIMENSIONAL STANDARDS****MASSNORMEN**

| EVROPSKÉ NORMY | EUROPEAN STANDARDS | EUROPÄISCHE NORMEN |
|----------------|--------------------|--------------------|
|----------------|--------------------|--------------------|

| EN 10 210-2                                                                                                                                       |                                                                                                                             |                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Duté profily tvářené za tepla z nelegovaných a jemnozrnných konstrukčních ocelí                                                                   | Hot finished structural hollow sections of non-alloy and fine grain structural steels                                       | Warmgefertigte Hohlprofile für den Stahlbau aus unlegierten Baustählen und aus Feinkornbaustählen                                     |
| EN 10 216-1                                                                                                                                       |                                                                                                                             |                                                                                                                                       |
| Bezešvé ocelové trubky pro nádoby a zařízení – trubky z nelegovaných ocelí se zaručenými vlastnostmi při okolní teplotě                           | Seamless steel tubes for pressure purposes – non-alloy steel tubes with specified room temperature properties               | Nahtlose Stahlrohre zu Druckzwecken – aus unlegierten Stählen mit garantierten Eigenschaften unter Raumtemperaturen                   |
| EN 10216-2                                                                                                                                        |                                                                                                                             |                                                                                                                                       |
| Bezešvé ocelové trubky pro tlakové nádoby a zařízení – trubky z nelegovaných a legovaných ocelí se zaručenými vlastnostmi při zvýšených teplotách | Seamless steel tubes for pressure purposes – non-alloy and alloy steel tubes with specified elevated temperature properties | Nahtlose Stahlrohre zu Druckzwecken – aus unlegierten und legierten Stählen mit garantierten Eigenschaften bei höheren Temperaturen   |
| EN 10216-3                                                                                                                                        |                                                                                                                             |                                                                                                                                       |
| Bezešvé ocelové trubky pro tlakové nádoby a zařízení – trubky z legovaných jemnozrnných ocelí                                                     | Seamless steel tubes for pressure purposes – alloy fine grain steel tubes                                                   | Nahtlose Stahlrohre zu Druckzwecken – aus legierten Feinkornstählen                                                                   |
| EN 10216-4                                                                                                                                        |                                                                                                                             |                                                                                                                                       |
| Bezešvé ocelové trubky pro tlakové nádoby a zařízení – trubky z nelegovaných a legovaných ocelí se zaručenými vlastnostmi při nízkých teplotách   | Seamless steel tubes for pressure purposes – non-alloy and alloy steel tubes with specified low temperature properties      | Nahtlose Stahlrohre zu Druckzwecken – aus unlegierten und legierten Stählen mit garantierten Eigenschaften bei niedrigen Temperaturen |
| EN 10220                                                                                                                                          |                                                                                                                             |                                                                                                                                       |
| Bezešvé a svařované ocelové trubky                                                                                                                | Seamless and welded steel tubes                                                                                             | Nahtlose und geschweißte Stahlrohre                                                                                                   |
| EN 10297-1                                                                                                                                        |                                                                                                                             |                                                                                                                                       |
| Bezešvé ocelové trubky kruhového příčného průřezu pro strojírenství a všeobecné použití – trubky z nelegovaných a legovaných ocelí                | Seamless circular steel tubes for mechanical and general engineering purposes                                               | Nahtlose kreisförmige Rohre für Maschinenbau und für allgemeine technische Verwendung – Rohre aus unlegierten und legierten Stählen   |

| NĚMECKO | GERMANY | DEUTSCHLAND |
|---------|---------|-------------|
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| DIN 2448               |                      |                     |
|------------------------|----------------------|---------------------|
| Trubky ocelové bezešvé | Seamless steel tubes | Nahtlose Stahlrohre |

| USA | USA | USA |
|-----|-----|-----|
|-----|-----|-----|

| ANSI/ASME B36.10M                          |                                     |                                     |
|--------------------------------------------|-------------------------------------|-------------------------------------|
| Svařované a bezešvé ocelové trubky         | Welded and seamless pipe            | Geschweißte und nahtlose Stahlrohre |
| API SPEC 5CT                               |                                     |                                     |
| Specifikace pro pažnicové a čerpací trubky | Specification for Casing and Tubing | Vorschriften für Casing und Tubing  |
| API SPEC 5L                                |                                     |                                     |
| Specifikace pro naftovodné trubky          | Specification for Line Pipe         | Vorschriften für Ölfeldrohre        |

|                                        |                                         |                                         |                                                                                    |
|----------------------------------------|-----------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM | SEAMLESS STEEL TUBES PRODUCTION PROGRAM | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |  |
| PŘEHLED POUŽÍVANÝCH NOREM              | REVIEW OF APPLICABLE STANDARDS          | ÜBERSICHT DER VERWENDETEN NORMEN        |                                                                                    |
| Rozměrové normy                        | Dimensional standards                   | Massnormen                              |                                                                                    |

| FRANCIE | FRANCE | FRANKREICH |
|---------|--------|------------|
|---------|--------|------------|

| NF A 49 - 112                                                                                     |                                                                                                                                   |                                                                                                       |
|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Bezešvé trubky s hladkými konci válcované za tepla se zaručenými vlastnostmi při normální teplotě | Steel tubes – plain end seamless hot rolled tubes with specified room temperature properties and with special delivery conditions | Nahtlose warmgewalzte Rohre mit glatten Enden mit garantierten Eigenschaften bei normaler Temperatur  |
| NF A 49 - 211                                                                                     |                                                                                                                                   |                                                                                                       |
| Bezešvé trubky s hladkými konci z nelegované oceli pro vedení zvýšené teploty                     | Seamless plain and unalloyed steel tubes for fluid typing at elevated temperatures                                                | Nahtlose Rohre mit glatten Enden aus unlegiertem Stahl für Leitung von Medien mit erhöhter Temperatur |
| NF A 49 - 311                                                                                     |                                                                                                                                   |                                                                                                       |
| Bezešvé trubky z ocelí nelegovaných a legovaných s Mo a Cr-Mo používané při zvýšených teplotách   | Seamless tubes for mechanical application                                                                                         | Nahtlose Rohre für mechanische Verwendung                                                             |

| ČESKÁ REPUBLIKA | CZECH REPUBLIC | TSCHECHISCHE REPUBLIK |
|-----------------|----------------|-----------------------|
|-----------------|----------------|-----------------------|

| ČSN ISO 4200                                                                       |                                                                                     |                                                                                  |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Trubky ocelové bezešvé tvářené za tepla                                            | Hot-formed seamless steel tubes                                                     | Nahtlose warmgewalzte Stahlrohre                                                 |
| ČSN 42 5715                                                                        |                                                                                     |                                                                                  |
| Trubky ocelové bezešvé tvářené za tepla                                            | Hot-formed seamless steel tubes                                                     | Nahtlose warmgewalzte Stahlrohre                                                 |
| ČSN 42 5716                                                                        |                                                                                     |                                                                                  |
| Trubky ocelové bezešvé tvářené za tepla s malými mezními úchylkami                 | Hot-formed seamless steel tubes with small tolerances                               | Nahtlose warmgewalzte Stahlrohre mit kleinen Grenzabweichungen                   |
| ČSN 42 5720                                                                        |                                                                                     |                                                                                  |
| Trubky ocelové bezešvé čtyřhranné tvářené za tepla                                 | Hot-formed seamless square and rectangular tubes                                    | Nahtlose Vierkantstahlrohre, warmgewalzte                                        |
| ČSN 42 5750                                                                        |                                                                                     |                                                                                  |
| Trubky bezešvé z oceli třídy 17 tvářené za tepla                                   | Seamless hot formed ferritic and austenitic steel tubes                             | Nahtlose warmgewalzte Rohre aus Stahl der Klasse 17                              |
| VN 42 0256                                                                         |                                                                                     |                                                                                  |
| Trubky ocelové bezešvé tlustostěnné tvářené za tepla z oceli tříd 11 až 16         | Hot formed seamless carbon and alloy steel extra strong tubes                       | Nahtlose dickwandige Stahlrohre, warmgewalzte aus dem Stahl der Klasse 11 bis 16 |
| VN 42 5792                                                                         |                                                                                     |                                                                                  |
| Trubky přírubové podélně svařované s dvojitými lemy a točivými přírubami pro PN 16 | Flanged longitudinally welded tubes with double borders and rotary flange for PN 16 | Längsgeschweisste Flanschrohre mit Doppelrändern und mit Drehflanschen für PN 16 |



|                                                          |                                                                              |                                                                            |
|----------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                   | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                                      | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM                                    |
| CHEMICKÉ SLOŽENÍ OCELÍ VYRÁBĚNÝCH DLE ZAHRANIČNÍCH NOREM | CHEMICAL COMPOSITION OF STEEL GRADES PRODUCED ACCORDING TO FOREIGN STANDARDS | CHEMISCHE ZUSAMMENSETZUNG DER GEMÄSS AUSLÄNDISCHEN NORMEN ERZEUGTEN STÄHLE |
|                                                          |                                                                              |                                                                            |

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| CHEMICKÉ SLOŽENÍ OCELÍ<br>VYRÁBĚNÝCH DLE ZAHRANIČNÍCH<br>NOREM |                       |               |               |               | CHEMICAL COMPOSITION OF STEEL<br>GRADES PRODUCED ACCORDING TO<br>FOREIGN STANDARDS |           |              |              |               |               |              | CHEMISCHE ZUSAMMENSETZUNG DER<br>GEMÄSS AUSLÄNDISCHEN NORMEN<br>ERZEUGTEN STÄHLE |   |                                                   |               |               |  |
|----------------------------------------------------------------|-----------------------|---------------|---------------|---------------|------------------------------------------------------------------------------------|-----------|--------------|--------------|---------------|---------------|--------------|----------------------------------------------------------------------------------|---|---------------------------------------------------|---------------|---------------|--|
| Norma                                                          | Jakost                | C             | Mn            | Si            | P<br>max.                                                                          | S<br>max. | Cu           | Ni           | Cr            | Mo            | V            | Al                                                                               | N | Nb, Ti, B, As a W                                 | CEIIW<br>max. | CEPcm<br>max. |  |
| Standard                                                       | Grade                 | C             | Mn            | Si            | P<br>max.                                                                          | S<br>max. | Cu           | Ni           | Cr            | Mo            | V            | Al                                                                               | N | Nb, Ti, B, As and W                               | CEIIW<br>max. | CEPcm<br>max. |  |
| Norm                                                           | Güte                  | C             | Mn            | Si            | P<br>max.                                                                          | S<br>max. | Cu           | Ni           | Cr            | Mo            | V            | Al                                                                               | N | Nb, Ti, B, As und W                               | CEIIW<br>max. | CEPcm<br>max. |  |
| API Spec. 5CT                                                  | H-40                  |               |               |               | 0,030                                                                              | 0,030     |              |              |               |               |              |                                                                                  |   |                                                   |               |               |  |
| API Spec. 5CT                                                  | J-55                  |               |               |               | 0,030                                                                              | 0,030     |              |              |               |               |              |                                                                                  |   |                                                   |               |               |  |
| API Spec. 5CT                                                  | K-55                  |               |               |               | 0,030                                                                              | 0,030     |              |              |               |               |              |                                                                                  |   |                                                   |               |               |  |
| API Spec. 5CT                                                  | N-80 Typ 1            |               |               |               | 0,030                                                                              | 0,030     |              |              |               |               |              |                                                                                  |   |                                                   |               |               |  |
| API Spec. 5CT                                                  | N-80 Typ Q            |               |               |               | 0,030                                                                              | 0,030     |              |              |               |               |              |                                                                                  |   |                                                   |               |               |  |
| API Spec. 5CT                                                  | L-80 Typ 1            | max.<br>0,43  | max.<br>1,90  | max.<br>0,45  | 0,030                                                                              | 0,030     | max.<br>0,35 | max.<br>0,25 |               |               |              |                                                                                  |   |                                                   |               |               |  |
| API Spec. 5L                                                   | A<br>(L210) PSL 1     | max.<br>0,22  | max.<br>0,90  |               | 0,030                                                                              | 0,030     | max.<br>0,50 | max.<br>0,50 | max.<br>0,50  | max.<br>0,15  |              |                                                                                  |   |                                                   |               |               |  |
| API Spec. 5L                                                   | B<br>(L245) PSL 1     | max.<br>0,28  | max.<br>1,20  |               | 0,030                                                                              | 0,030     | max.<br>0,50 | max.<br>0,50 | max.<br>0,50  | max.<br>0,15  |              |                                                                                  |   | Nb+V max. 0,06<br>Nb+V+Ti max. 0,15               |               |               |  |
| API Spec. 5L                                                   | BR<br>(L245R) PSL 2   | max.<br>0,24  | max.<br>1,20  | max.<br>0,40  | 0,025                                                                              | 0,015     | max.<br>0,50 | max.<br>0,30 | max.<br>0,30  | max.<br>0,15  |              |                                                                                  |   | Ti max. 0,04 Nb+V<br>max. 0,06                    | 0,43          | 0,25          |  |
| API Spec. 5L                                                   | X42<br>(L290) PSL 1   | max.<br>0,28  | max.<br>1,30  |               | 0,030                                                                              | 0,030     | max.<br>0,50 | max.<br>0,50 | max.<br>0,50  | max.<br>0,15  |              |                                                                                  |   | Nb+V+Ti max. 0,15                                 |               |               |  |
| API Spec. 5L                                                   | X42N<br>(L290N) PSL 2 | max.<br>0,24  | max.<br>1,20  | max.<br>0,40  | 0,025                                                                              | 0,015     | max.<br>0,50 | max.<br>0,30 | max.<br>0,30  | max.<br>0,15  | max.<br>0,06 |                                                                                  |   | Nb max. 0,05<br>Ti max. 0,04                      | 0,43          | 0,25          |  |
| API Spec. 5L                                                   | X46<br>(L320) PSL 1   | max.<br>0,28  | max.<br>1,40  |               | 0,030                                                                              | 0,030     | max.<br>0,50 | max.<br>0,50 | max.<br>0,50  | max.<br>0,15  |              |                                                                                  |   | Nb+V+Ti max. 0,15                                 |               |               |  |
| API Spec. 5L                                                   | X46N<br>(L320N) PSL 2 | max.<br>0,24  | max.<br>1,40  | max.<br>0,40  | 0,025                                                                              | 0,015     | max.<br>0,50 | max.<br>0,30 | max.<br>0,30  | max.<br>0,15  | max.<br>0,07 |                                                                                  |   | Nb max. 0,05<br>Ti max. 0,04<br>Nb+V+Ti max. 0,15 | 0,43          | 0,25          |  |
| API Spec. 5L                                                   | X52<br>(L360) PSL 1   | max.<br>0,28  | max.<br>1,40  |               | 0,030                                                                              | 0,030     | max.<br>0,50 | max.<br>0,50 | max.<br>0,50  | max.<br>0,15  |              |                                                                                  |   | Nb+V+Ti max. 0,15                                 |               |               |  |
| API Spec. 5L                                                   | X52N<br>(L360N) PSL 2 | max.<br>0,24  | max.<br>1,40  | max.<br>0,45  | 0,025                                                                              | 0,015     | max.<br>0,50 | max.<br>0,30 | max.<br>0,30  | max.<br>0,15  | max.<br>0,10 |                                                                                  |   | Nb max. 0,05<br>Ti max. 0,04<br>Nb+V+Ti max. 0,15 | 0,43          | 0,25          |  |
| API Spec. 5L                                                   | X56<br>(L390) PSL 1   | max.<br>0,28  | max.<br>1,40  |               | 0,030                                                                              | 0,030     | max.<br>0,50 | max.<br>0,50 | max.<br>0,50  | max.<br>0,15  |              |                                                                                  |   | Nb+V+Ti max. 0,15                                 |               |               |  |
| API Spec. 5L                                                   | X56N<br>(L390N) PSL 2 | max.<br>0,24  | max.<br>1,40  | max.<br>0,45  | 0,025                                                                              | 0,015     | max.<br>0,50 | max.<br>0,30 | max.<br>0,30  | max.<br>0,15  | max.<br>0,10 |                                                                                  |   | Nb max. 0,05<br>Ti max. 0,04<br>Nb+V+Ti max. 0,15 | 0,43          | 0,25          |  |
| API Spec. 5L                                                   | X60<br>(L415) PSL 1   | max.<br>0,28  | max.<br>1,40  |               | 0,030                                                                              | 0,030     | max.<br>0,50 | max.<br>0,50 | max.<br>0,50  | max.<br>0,15  |              |                                                                                  |   | Nb+V+Ti max. 0,15                                 |               |               |  |
| API Spec. 5L                                                   | X60N<br>(L415N) PSL 2 | max.<br>0,24  | max.<br>1,40  | max.<br>0,45  | 0,025                                                                              | 0,015     | max.<br>0,50 | max.<br>0,50 | max.<br>0,50  | max.<br>0,50  | max.<br>0,10 |                                                                                  |   | Nb max. 0,05<br>Ti max. 0,04<br>Nb+V+Ti max. 0,15 |               |               |  |
| ASTM A53                                                       | Gr. A                 | max.<br>0,25  | max.<br>0,95  |               | 0,050                                                                              | 0,045     | max.<br>0,40 | max.<br>0,40 | max.<br>0,40  | max.<br>0,15  | max.<br>0,08 |                                                                                  |   |                                                   |               |               |  |
| ASTM A53                                                       | Gr. B                 | max.<br>0,30  | max.<br>1,20  |               | 0,050                                                                              | 0,045     | max.<br>0,40 | max.<br>0,40 | max.<br>0,40  | max.<br>0,15  | max.<br>0,08 |                                                                                  |   |                                                   |               |               |  |
| ASTM A106                                                      | Gr. A                 | max.<br>0,25  | 0,27-<br>0,93 | min.<br>0,10  | 0,035                                                                              | 0,035     | max.<br>0,40 | max.<br>0,40 | max.<br>0,40  | max.<br>0,15  | max.<br>0,08 |                                                                                  |   |                                                   |               |               |  |
| ASTM A106                                                      | Gr. B                 | max.<br>0,30  | 0,29-<br>1,06 | min.<br>0,10  | 0,035                                                                              | 0,035     | max.<br>0,40 | max.<br>0,40 | max.<br>0,40  | max.<br>0,15  | max.<br>0,08 |                                                                                  |   |                                                   |               |               |  |
| ASTM A106                                                      | Gr. C                 | max.<br>0,35  | 0,29-<br>1,06 | min.<br>0,10  | 0,035                                                                              | 0,035     | max.<br>0,40 | max.<br>0,40 | max.<br>0,40  | max.<br>0,15  | max.<br>0,08 |                                                                                  |   |                                                   |               |               |  |
| ASTM A333                                                      | Gr. 1                 | max.<br>0,30  | 0,40-<br>1,06 |               | 0,025                                                                              | 0,025     |              |              |               |               |              |                                                                                  |   |                                                   |               |               |  |
| ASTM A333                                                      | Gr. 6                 | max.<br>0,30  | 0,29-<br>1,06 | min.<br>0,10  | 0,025                                                                              | 0,025     |              |              |               |               |              |                                                                                  |   |                                                   |               |               |  |
| ASTM A335                                                      | P. 1                  | 0,10-<br>0,20 | 0,30-<br>0,80 | 0,10-<br>0,50 | 0,025                                                                              | 0,025     |              |              |               | 0,44-<br>0,65 |              |                                                                                  |   |                                                   |               |               |  |
| ASTM A335                                                      | P. 11                 | 0,05-<br>0,15 | 0,30-<br>0,60 | 0,50-<br>1,00 | 0,025                                                                              | 0,025     |              |              | 1,00-<br>1,50 | 0,44-<br>0,65 |              |                                                                                  |   |                                                   |               |               |  |
| ASTM A335                                                      | P. 12                 | 0,05-<br>0,15 | 0,30-<br>0,61 | max.<br>0,50  | 0,025                                                                              | 0,025     |              |              | 0,80-<br>1,25 | 0,44-<br>0,65 |              |                                                                                  |   |                                                   |               |               |  |


CHEMICKÉ SLOŽENÍ OCELÍ VYRÁBĚNÝCH DLE  
ZAHRA NIČNÍCH NOREM

CHEMICAL COMPOSITION OF STEEL GRADES  
PRODUCED ACCORDING TO FOREIGN STANDARDS

CHEMISCHE ZUSAMMENSETZUNG DER GEMÄSS  
AUSLÄNDISCHEN NORMEN ERZEUGTEN STÄHLE

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| Norma      | Jakost       | C             | Mn            | Si            | P<br>max. | S<br>max.       | Cu           | Ni           | Cr            | Mo            | V             | Al              | N             | Nb, Ti, B, As a W   | CEI IW<br>max. | CEPcm<br>max. |
|------------|--------------|---------------|---------------|---------------|-----------|-----------------|--------------|--------------|---------------|---------------|---------------|-----------------|---------------|---------------------|----------------|---------------|
| Standard   | Grade        | C             | Mn            | Si            | P<br>max. | S<br>max.       | Cu           | Ni           | Cr            | Mo            | V             | Al              | N             | Nb, Ti, B, As and W | CEI IW<br>max. | CEPcm<br>max. |
| Norm       | Güte         | C             | Mn            | Si            | P<br>max. | S<br>max.       | Cu           | Ni           | Cr            | Mo            | V             | Al              | N             | Nb, Ti, B, As und W | CEI IW<br>max. | CEPcm<br>max. |
| ASTM A335  | P. 22        | 0,05-<br>0,15 | 0,30-<br>0,60 | max.<br>0,50  | 0,025     | 0,025           |              |              | 1,90-<br>2,60 | 0,87-<br>1,13 |               |                 |               |                     |                |               |
| ASTM A335  | P. 5         | max.<br>0,15  | 0,30-<br>0,60 | max.<br>0,50  | 0,025     | 0,025           |              |              | 4,00-<br>6,00 | 0,45-<br>0,65 |               |                 |               |                     |                |               |
| ASTM A335  | P. 2         | 0,10-<br>0,20 | 0,30-<br>0,61 | 0,10-<br>0,30 | 0,025     | 0,025           |              |              | 0,50-<br>0,81 | 0,44-<br>0,65 |               |                 |               |                     |                |               |
| ASTM A335  | P. 91        | 0,08-<br>0,12 | 0,30-<br>0,60 | 0,20-<br>0,50 | 0,020     | 0,010           |              | max.<br>0,40 | 8,00-<br>9,50 | 0,85-<br>1,05 | 0,18-<br>0,25 | max.<br>0,02    | 0,03-<br>0,07 | Ti max. 0,01        |                |               |
| EN 2097-1  | 20MnV6       | 0,16-<br>0,22 | 1,30-<br>1,70 | 0,10-<br>0,50 | 0,035     | 0,035           |              | max.<br>0,40 | 0,40          | 0,20          | 0,10-<br>0,20 |                 | max.<br>0,20  |                     |                |               |
| EN 2097-1  | 30G2         | 0,27-<br>0,36 | 1,40-<br>1,80 | 0,17-<br>0,37 | 0,035     | 0,035           |              | max.<br>0,30 | max.<br>0,25  |               |               |                 |               |                     |                |               |
| DIN        | X10CrMoVNb91 | 0,08-<br>0,12 | 0,30-<br>0,60 | 0,20-<br>0,50 | 0,020     | 0,010           |              | max.<br>0,40 | 8,00-<br>9,50 | 0,85-<br>1,05 | 0,18-<br>0,25 | max.<br>0,040   | 0,03-<br>0,07 | Nb 0,06-0,10        |                |               |
| DIN        | St 52.0V     | 0,17-<br>0,22 | 0,90-<br>1,20 | 0,17-<br>0,37 | 0,040     | 0,040           | max.<br>0,30 | max.<br>0,30 | max.<br>0,30  |               |               | min.<br>0,015   |               | B 0,001-0,004       |                |               |
| DIN        | St 52.0 MEC  | 0,16-<br>0,20 | 1,25-<br>1,50 |               | 0,035     | 0,020-<br>0,035 |              |              |               |               | max.<br>0,10  | 0,020-<br>0,050 |               |                     |                |               |
| DIN 1629   | St 37.0      | max.<br>0,17  |               |               | 0,040     | 0,040           |              |              |               |               |               |                 | 0,009         |                     |                |               |
| DIN 1629   | St 44.0      | max.<br>0,21  |               |               | 0,040     | 0,040           |              |              |               |               |               |                 | 0,009         |                     |                |               |
| DIN 1629   | St 52.0      | max.<br>0,22  | max.<br>1,60  | max.<br>0,55  | 0,040     | 0,035           |              |              |               |               |               | min.<br>0,020   |               |                     |                |               |
| DIN 1630   | St 37.4      | max.<br>0,17  | min.<br>0,35  | max.<br>0,35  | 0,040     | 0,040           |              |              |               |               |               | min.<br>0,020   |               |                     |                |               |
| DIN 1630   | St 44.4      | max.<br>0,20  | min.<br>0,40  | max.<br>0,35  | 0,040     | 0,040           |              |              |               |               |               | min.<br>0,020   |               |                     |                |               |
| DIN 1630   | St 52.4      | max.<br>0,22  | max.<br>1,60  | max.<br>0,55  | 0,040     | 0,035           |              |              |               |               |               | min.<br>0,020   |               |                     |                |               |
| DIN 17 121 | RSt 37-2     | max.<br>0,17  |               |               | 0,050     | 0,050           |              |              |               |               |               |                 | 0,009         |                     |                |               |
| DIN 17 121 | St 44-2      | max.<br>0,21  |               |               | 0,050     | 0,050           |              |              |               |               |               |                 | 0,009         |                     |                |               |
| DIN 17 121 | St 37-3      | max.<br>0,17  |               |               | 0,040     | 0,040           |              |              |               |               |               | min.<br>0,020   |               |                     |                |               |
| DIN 17 121 | St 44-3      | max.<br>0,20  |               |               | 0,040     | 0,040           |              |              |               |               |               | min.<br>0,020   |               |                     |                |               |
| DIN 17 121 | St 52-3      | max.<br>0,22  | max.<br>1,60  | max.<br>0,55  | 0,040     | 0,040           |              |              |               |               |               | min.<br>0,020   |               |                     |                |               |
| DIN 17 172 | StE 210.7    | max.<br>0,17  | min.<br>0,35  | max.<br>0,45  | 0,040     | 0,035           |              |              |               |               |               |                 |               |                     |                |               |
| DIN 17 172 | StE 240.7    | max.<br>0,17  | min.<br>0,40  | max.<br>0,45  | 0,040     | 0,035           |              |              |               |               |               | min.<br>0,020   |               |                     |                |               |
| DIN 17 172 | StE 290.7    | max.<br>0,22  | 0,50-<br>1,10 | max.<br>0,45  | 0,040     | 0,035           |              |              |               |               |               | min.<br>0,020   |               |                     |                |               |
| DIN 17 172 | StE 320.7    | max.<br>0,22  | 0,70-<br>1,30 | max.<br>0,45  | 0,040     | 0,035           |              |              |               |               |               | min.<br>0,020   |               |                     |                |               |
| DIN 17 172 | StE 360.7    | max.<br>0,22  | 0,90-<br>1,50 | max.<br>0,55  | 0,040     | 0,035           |              |              |               |               |               | min.<br>0,020   |               |                     |                |               |
| DIN 17 173 | TTSt 35N     | max.<br>0,17  | min.<br>0,40  | max.<br>0,35  | 0,030     | 0,025           |              |              |               |               |               | min.<br>0,020   |               |                     |                |               |
| DIN 17 173 | TTSt 35V     | max.<br>0,17  | min.<br>0,40  | max.<br>0,35  | 0,030     | 0,025           |              |              |               |               |               | min.<br>0,020   |               |                     |                |               |
| DIN 17 175 | St 35.8      | max.<br>0,17  | 0,40-<br>0,80 | 0,10-<br>0,35 | 0,040     | 0,040           |              |              |               |               |               |                 |               |                     |                |               |
| DIN 17 175 | St 45.8      | max.<br>0,21  | 0,40-<br>1,20 | 0,10-<br>0,35 | 0,040     | 0,040           |              |              |               |               |               |                 |               |                     |                |               |

## VYSVĚTLIVKY

## LEGEND

## ERLÄUTERUNGEN

Vyrábíme po dohodě.

Special agreement necessary.

Wir fertigen im begrenzten Umfang und nur nach Vereinbarung.



|                                                          |  |  |  |                                                                              |  |  |  |                                                                            |  |  |  |
|----------------------------------------------------------|--|--|--|------------------------------------------------------------------------------|--|--|--|----------------------------------------------------------------------------|--|--|--|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                   |  |  |  | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                                      |  |  |  | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM                                    |  |  |  |
| CHEMICKÉ SLOŽENÍ OCELÍ VYRÁBĚNÝCH DLE ZAHRANIČNÍCH NOREM |  |  |  | CHEMICAL COMPOSITION OF STEEL GRADES PRODUCED ACCORDING TO FOREIGN STANDARDS |  |  |  | CHEMISCHE ZUSAMMENSETZUNG DER GEMÄSS AUSLÄNDISCHEN NORMEN ERZEUGTEN STÄHLE |  |  |  |
|                                                          |  |  |  |                                                                              |  |  |  |                                                                            |  |  |  |

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| Norma      | Jakost     | C         | Mn        | Si        | P max. | S max. | Cu        | Ni        | Cr        | Mo        | V         | Al          | N          | Nb, Ti, B, As a W            | CEIIW max. | CEPcm max. |
|------------|------------|-----------|-----------|-----------|--------|--------|-----------|-----------|-----------|-----------|-----------|-------------|------------|------------------------------|------------|------------|
| Standard   | Grade      | C         | Mn        | Si        | P max. | S max. | Cu        | Ni        | Cr        | Mo        | V         | Al          | N          | Nb, Ti, B, As and W          | CEIIW max. | CEPcm max. |
| Norm       | Güte       | C         | Mn        | Si        | P max. | S max. | Cu        | Ni        | Cr        | Mo        | V         | Al          | N          | Nb, Ti, B, As und W          | CEIIW max. | CEPcm max. |
| DIN 17 175 | 15Mo3      | 0,12-0,20 | 0,40-0,80 | 0,10-0,35 | 0,035  | 0,035  |           |           |           | 0,25-0,35 |           |             |            |                              |            |            |
| DIN 17 175 | 10CrMo910  | 0,08-0,15 | 0,40-0,70 | max. 0,50 | 0,035  | 0,035  |           |           | 2,00-2,50 | 0,90-1,20 |           |             |            |                              |            |            |
| DIN 17 175 | 13CrMo44   | 0,10-0,18 | 0,40-0,70 | 0,10-0,35 | 0,035  | 0,035  |           |           | 0,70-1,10 | 0,45-0,65 |           |             |            |                              |            |            |
| DIN 17 175 | 14MoV63    | 0,10-0,18 | 0,40-0,70 | 0,10-0,35 | 0,035  | 0,035  |           |           | 0,30-0,60 | 0,50-0,70 | 0,22-0,32 |             |            |                              |            |            |
| DIN 17 176 | 12CrMo19 5 | 0,08-0,15 | 0,30-0,60 | max. 0,50 | 0,025  | 0,020  |           |           | 4,00-6,00 | 0,45-0,65 |           |             |            |                              |            |            |
| DIN 17 204 | 25CrMo4    | 0,22-0,29 | 0,60-0,90 | max. 0,40 | 0,035  | 0,035  |           |           | 0,90-1,20 | 0,15-0,30 |           |             |            |                              |            |            |
| DIN 17 204 | 34CrMo4    | 0,30-0,37 | 0,60-0,90 | max. 0,40 | 0,035  | 0,035  |           |           | 0,90-1,20 | 0,15-0,30 |           |             |            |                              |            |            |
| DIN 17 204 | 41Cr4      | 0,38-0,45 | 0,60-0,90 | max. 0,40 | 0,035  | 0,035  |           |           | 0,90-1,20 |           |           |             |            |                              |            |            |
| DIN 17 204 | C 22       | 0,17-0,24 | 0,30-0,60 | max. 0,40 | 0,045  | 0,045  |           |           |           |           |           |             |            |                              |            |            |
| DIN 17 204 | C 35       | 0,32-0,39 | 0,50-0,80 | max. 0,40 | 0,045  | 0,045  |           |           |           |           |           |             |            |                              |            |            |
| DIN 17 204 | C 45       | 0,42-0,50 | 0,50-0,80 | max. 0,40 | 0,045  | 0,045  |           |           |           |           |           |             |            |                              |            |            |
| DIN 17 204 | C 55       | 0,52-0,60 | 0,60-0,90 | max. 0,40 | 0,045  | 0,045  |           |           |           |           |           |             |            |                              |            |            |
| DIN 17 204 | C 60       | 0,57-0,65 | 0,60-0,90 | max. 0,40 | 0,045  | 0,045  |           |           |           |           |           |             |            |                              |            |            |
| DIN 17 204 | Ck 22      | 0,17-0,24 | 0,30-0,60 | max. 0,40 | 0,035  | 0,035  |           |           |           |           |           |             |            |                              |            |            |
| DIN 17 204 | Ck 35      | 0,32-0,39 | 0,50-0,80 | max. 0,40 | 0,035  | 0,035  |           |           |           |           |           |             |            |                              |            |            |
| DIN 17 204 | Ck 45      | 0,42-0,50 | 0,50-0,80 | max. 0,40 | 0,035  | 0,035  |           |           |           |           |           |             |            |                              |            |            |
| DIN 17 204 | Ck 55      | 0,52-0,60 | 0,60-0,90 | max. 0,40 | 0,035  | 0,035  |           |           |           |           |           |             |            |                              |            |            |
| DIN 17 204 | Ck 60      | 0,57-0,65 | 0,60-0,90 | max. 0,40 | 0,035  | 0,035  |           |           |           |           |           |             |            |                              |            |            |
| DIN 17 210 | C 10       | 0,07-0,13 | 0,30-0,60 | max. 0,40 | 0,045  | 0,045  |           |           |           |           |           |             |            |                              |            |            |
| DIN 17 210 | C 15       | 0,12-0,18 | 0,30-0,60 | max. 0,40 | 0,045  | 0,045  |           |           |           |           |           |             |            |                              |            |            |
| DIN 17 210 | Ck 10      | 0,07-0,13 | 0,30-0,60 | max. 0,40 | 0,035  | 0,035  |           |           |           |           |           |             |            |                              |            |            |
| DIN 17 210 | Ck 15      | 0,12-0,18 | 0,30-0,60 | max. 0,40 | 0,035  | 0,035  |           |           |           |           |           |             |            |                              |            |            |
| DIN 17 100 | ZSt 60-2   | max. 0,40 | 0,20-0,50 | 0,03-0,30 | 0,035  | 0,050  |           |           |           |           |           |             | max. 0,012 |                              |            |            |
| DIN 17 100 | St 60-2    | max. 0,40 | 0,20-0,50 | 0,03-0,30 | 0,035  | 0,050  |           |           |           |           |           |             | max. 0,012 |                              |            |            |
| EN 10155   | S355J2G1W  | max. 0,16 | 0,5-1,50  | max. 0,50 | 0,035  | 0,035  | 0,25-0,55 | max. 0,65 | 0,4-0,8   | max. 0,30 |           |             |            |                              |            |            |
| EN 10155   | S355K2G1W  | max. 0,16 | 0,5-1,50  | max. 0,50 | 0,035  | 0,035  | 0,25-0,55 | max. 0,65 | 0,4-0,8   | max. 0,30 |           |             |            |                              |            |            |
| EN 10208-2 | L 245 NB   | max. 0,16 | max. 1,10 | max. 0,40 | 0,025  | 0,020  | max. 0,25 | max. 0,30 | max. 0,30 | max. 0,10 |           | 0,015-0,060 | max. 0,012 |                              |            |            |
| EN 10208-2 | L 290 NB   | max. 0,17 | max. 1,20 | max. 0,40 | 0,025  | 0,020  | max. 0,25 | max. 0,30 | max. 0,30 | max. 0,10 | max. 0,05 | 0,015-0,060 | max. 0,012 | Nb max. 0,05<br>Ti max. 0,04 |            |            |
| EN 10208-2 | L 360 NB   | max. 0,20 | max. 1,60 | max. 0,45 | 0,025  | 0,020  | max. 0,25 | max. 0,30 | max. 0,30 | max. 0,10 | max. 0,10 | 0,015-0,060 | max. 0,012 | Nb max. 0,05<br>Ti max. 0,04 |            |            |
| EN 10208-2 | L 415 NB   | max. 0,21 | max. 1,60 | max. 0,45 | 0,025  | 0,020  | max. 0,25 | max. 0,30 | max. 0,30 | max. 0,10 | max. 0,15 | 0,015-0,060 | max. 0,012 |                              |            |            |


CHEMICKÉ SLOŽENÍ OCELÍ VYRÁBĚNÝCH DLE  
ZAHRANIČNÍCH NOREM

CHEMICAL COMPOSITION OF STEEL GRADES  
PRODUCED ACCORDING TO FOREIGN STANDARDS

CHEMISCHE ZUSAMMENSETZUNG DER GEMÄSS  
AUSLÄNDISCHEN NORMEN ERZEUGTEN STÄHLE

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| Norma      | Jakost  | C            | Mn            | Si           | P<br>max. | S<br>max. | Cu           | Ni           | Cr           | Mo           | V            | Al            | N             | Nb, Ti, B, As a W                              | CEIIW<br>max. | CEPcm<br>max. |
|------------|---------|--------------|---------------|--------------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|------------------------------------------------|---------------|---------------|
| Standard   | Grade   | C            | Mn            | Si           | P<br>max. | S<br>max. | Cu           | Ni           | Cr           | Mo           | V            | Al            | N             | Nb, Ti, B, As and W                            | CEIIW<br>max. | CEPcm<br>max. |
| Norm       | Güte    | C            | Mn            | Si           | P<br>max. | S<br>max. | Cu           | Ni           | Cr           | Mo           | V            | Al            | N             | Nb, Ti, B, As und W                            | CEIIW<br>max. | CEPcm<br>max. |
| EN 10210-1 | S235JRH | max.<br>0,17 | max.<br>1,40  |              | 0,040     | 0,040     |              |              |              |              |              |               | max.<br>0,009 |                                                |               |               |
| EN 10210-1 | S275JOH | max.<br>0,20 | max.<br>1,50  |              | 0,035     | 0,035     |              |              |              |              |              |               | max.<br>0,009 |                                                |               |               |
| EN 10210-1 | S275J2H | max.<br>0,20 | max.<br>1,50  |              | 0,030     | 0,030     |              |              |              |              |              | min.<br>0,020 |               |                                                |               |               |
| EN 10210-1 | S355JOH | max.<br>0,22 | max.<br>1,60  | max.<br>0,55 | 0,035     | 0,035     |              |              |              |              |              |               | max.<br>0,009 |                                                |               |               |
| EN 10210-1 | S355J2H | max.<br>0,22 | max.<br>1,60  | max.<br>0,55 | 0,030     | 0,030     |              |              |              |              |              | min.<br>0,020 |               |                                                |               |               |
| EN 10210-1 | S355K2H | max.<br>0,22 | max.<br>1,60  | max.<br>0,55 | 0,030     | 0,030     |              |              |              |              |              | min.<br>0,020 |               |                                                |               |               |
| EN 10210-1 | S275NH  | max.<br>0,20 |               | max.<br>0,40 | 0,035     | 0,030     | max.<br>0,35 | max.<br>0,30 | max.<br>0,30 | max.<br>0,10 | max.<br>0,15 | min.<br>0,020 | max.<br>0,015 | Nb max. 0,05<br>Ti max. 0,03                   |               |               |
| EN 10210-1 | S275NLH | max.<br>0,20 |               | max.<br>0,40 | 0,030     | 0,025     | max.<br>0,35 | max.<br>0,30 | max.<br>0,30 | max.<br>0,10 | max.<br>0,15 | min.<br>0,020 | max.<br>0,015 | Nb max. 0,05<br>Ti max. 0,03                   |               |               |
| EN 10210-1 | S355NH  | max.<br>0,20 | 0,90-<br>1,65 | max.<br>0,50 | 0,035     | 0,030     | max.<br>0,35 | max.<br>0,50 | max.<br>0,30 | max.<br>0,10 | max.<br>0,15 | min.<br>0,020 | max.<br>0,020 | Nb max. 0,05<br>Ti max. 0,03                   |               |               |
| EN 10210-1 | S355NLH | max.<br>0,18 | 0,90-<br>1,65 | max.<br>0,50 | 0,030     | 0,025     | max.<br>0,35 | max.<br>0,50 | max.<br>0,30 | max.<br>0,10 | max.<br>0,15 | min.<br>0,020 | max.<br>0,020 | Nb max. 0,05<br>Ti max. 0,03                   |               |               |
| EN 10210-1 | S420NH  | max.<br>0,22 | 1,00-<br>1,70 | max.<br>0,60 | 0,035     | 0,030     | max.<br>0,70 | max.<br>0,80 | max.<br>0,30 | max.<br>0,10 | max.<br>0,15 | min.<br>0,020 | max.<br>0,025 | Nb max. 0,05<br>Ti max. 0,03                   |               |               |
| EN 10210-1 | S420NLH | max.<br>0,22 | 1,00-<br>1,70 | max.<br>0,60 | 0,030     | 0,025     | max.<br>0,70 | max.<br>0,80 | max.<br>0,30 | max.<br>0,10 | max.<br>0,15 | min.<br>0,020 | max.<br>0,025 | Nb max. 0,05<br>Ti max. 0,03                   |               |               |
| EN 10210-1 | S460NH  | max.<br>0,22 | 1,00-<br>1,70 | max.<br>0,60 | 0,030     | 0,030     | max.<br>0,70 | max.<br>0,80 | max.<br>0,30 | max.<br>0,10 | max.<br>0,15 | min.<br>0,020 | max.<br>0,025 | Nb max. 0,05<br>Ti max. 0,03                   |               |               |
| EN 10210-1 | S460NLH | max.<br>0,22 | 1,00-<br>1,70 | max.<br>0,60 | 0,030     | 0,025     | max.<br>0,70 | max.<br>0,80 | max.<br>0,30 | max.<br>0,10 | max.<br>0,15 | min.<br>0,020 | max.<br>0,025 | Nb max. 0,05<br>Ti max. 0,03                   |               |               |
| EN 10216-1 | P195TR1 | max.<br>0,13 | max.<br>0,70  | max.<br>0,35 | 0,025     | 0,020     | max.<br>0,30 | max.<br>0,30 | max.<br>0,30 | max.<br>0,08 | max.<br>0,02 |               |               | Nb =0,010 Ti = 0,04<br>Cr+Cu+Mo+Ni max.<br>0,7 |               |               |
| EN 10216-1 | P195TR2 | max.<br>0,13 | max.<br>0,70  | max.<br>0,35 | 0,025     | 0,020     | max.<br>0,30 | max.<br>0,30 | max.<br>0,30 | max.<br>0,08 | max.<br>0,02 |               |               | Nb =0,010 Ti = 0,04<br>Cr+Cu+Mo+Ni max.<br>0,7 |               |               |
| EN 10216-1 | P235TR1 | max.<br>0,16 | max.<br>1,20  | max.<br>0,35 | 0,025     | 0,020     | max.<br>0,30 | max.<br>0,30 | max.<br>0,30 | max.<br>0,08 | max.<br>0,02 |               |               | Nb =0,010 Ti = 0,04<br>Cr+Cu+Mo+Ni max.<br>0,7 |               |               |
| EN 10216-1 | P235TR2 | max.<br>0,16 | max.<br>1,20  | max.<br>0,35 | 0,025     | 0,020     | max.<br>0,30 | max.<br>0,30 | max.<br>0,30 | max.<br>0,08 | max.<br>0,02 | min.<br>0,020 |               | Nb =0,010 Ti = 0,04<br>Cr+Cu+Mo+Ni max.<br>0,7 |               |               |
| EN 10216-1 | P265TR1 | max.<br>0,20 | max.<br>1,40  | max.<br>0,40 | 0,025     | 0,020     | max.<br>0,30 | max.<br>0,30 | max.<br>0,30 | max.<br>0,08 | max.<br>0,02 |               |               | Nb =0,010 Ti = 0,04<br>Cr+Cu+Mo+Ni max.<br>0,7 |               |               |
| EN 10216-1 | P265TR2 | max.<br>0,20 | max.<br>1,40  | max.<br>0,40 | 0,025     | 0,020     | max.<br>0,30 | max.<br>0,30 | max.<br>0,30 | max.<br>0,08 | max.<br>0,02 | min.<br>0,020 |               | Nb =0,010 Ti = 0,04<br>Cr+Cu+Mo+Ni max.<br>0,7 |               |               |
| EN 10216-2 | P195GH  | max.<br>0,13 | max.<br>0,70  | max.<br>0,35 | 0,025     | 0,020     | max.<br>0,30 | max.<br>0,30 | max.<br>0,30 | max.<br>0,08 | max.<br>0,02 | min.<br>0,020 |               | Nb =0,010 Ti = 0,04<br>Cr+Cu+Mo+Ni max.<br>0,7 |               |               |
| EN 10216-2 | P235GH  | max.<br>0,16 | max.<br>1,20  | max.<br>0,35 | 0,025     | 0,020     | max.<br>0,30 | max.<br>0,30 | max.<br>0,30 | max.<br>0,08 | max.<br>0,02 | min.<br>0,020 |               | Nb =0,010 Ti = 0,04<br>Cr+Cu+Mo+Ni max.<br>0,7 |               |               |

| VYSVĚTLIVKY         | LEGEND                       | ERLÄUTERUNGEN                                                |
|---------------------|------------------------------|--------------------------------------------------------------|
| Vyrábíme po dohodě. | Special agreement necessary. | Wir fertigen im begrenzten Umfang und nur nach Vereinbarung. |



|                                                          |  |  |  |  |                                                                              |  |  |  |  |  |  |                                                                            |  |  |  |  |
|----------------------------------------------------------|--|--|--|--|------------------------------------------------------------------------------|--|--|--|--|--|--|----------------------------------------------------------------------------|--|--|--|--|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                   |  |  |  |  | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                                      |  |  |  |  |  |  | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM                                    |  |  |  |  |
| CHEMICKÉ SLOŽENÍ OCELÍ VYRÁBĚNÝCH DLE ZAHRANIČNÍCH NOREM |  |  |  |  | CHEMICAL COMPOSITION OF STEEL GRADES PRODUCED ACCORDING TO FOREIGN STANDARDS |  |  |  |  |  |  | CHEMISCHE ZUSAMMENSETZUNG DER GEMÄSS AUSLÄNDISCHEN NORMEN ERZEUGTEN STÄHLE |  |  |  |  |
|                                                          |  |  |  |  |                                                                              |  |  |  |  |  |  |                                                                            |  |  |  |  |

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| Norma      | Jakost          | C         | Mn        | Si        | P max. | S max. | Cu                      | Ni        | Cr        | Mo        | V         | Al                       | N           | Nb, Ti, B, As a W                                                        | CEIIW max. | CEPcm max. |
|------------|-----------------|-----------|-----------|-----------|--------|--------|-------------------------|-----------|-----------|-----------|-----------|--------------------------|-------------|--------------------------------------------------------------------------|------------|------------|
| Standard   | Grade           | C         | Mn        | Si        | P max. | S max. | Cu                      | Ni        | Cr        | Mo        | V         | Al                       | N           | Nb, Ti, B, As and W                                                      | CEIIW max. | CEPcm max. |
| Norm       | Güte            | C         | Mn        | Si        | P max. | S max. | Cu                      | Ni        | Cr        | Mo        | V         | Al                       | N           | Nb, Ti, B, As und W                                                      | CEIIW max. | CEPcm max. |
| EN 10216-2 | P265GH          | max. 0,20 | max. 1,40 | max. 0,40 | 0,025  | 0,020  | max. 0,30               | max. 0,30 | max. 0,30 | max. 0,08 | max. 0,02 | min. 0,020               |             | Nb =0,010 Ti = 0,04<br>Cr+Cu+Mo+Ni max. 0,7                              |            |            |
| EN 10216-2 | 16Mo3           | 0,12-0,20 | 0,40-0,90 | max 0,35  | 0,025  | 0,020  | max. 0,30               | max. 0,30 | max. 0,30 | 0,25-0,35 |           | max. 0,040               |             |                                                                          |            |            |
| EN 10216-2 | 10CrMo9-10      | 0,08-0,14 | 0,30-0,70 | max. 0,50 | 0,025  | 0,020  | max. 0,30               | max. 0,30 | 2,0-2,50  | 0,90-1,10 |           | max. 0,040               |             |                                                                          |            |            |
| EN 10216-2 | 11CrMo9-10      | 0,08-0,15 | 0,40-0,80 | max. 0,50 | 0,025  | 0,020  | max. 0,30               | max. 0,30 | 2,0-2,50  | 0,90-1,10 |           | max. 0,040               |             |                                                                          |            |            |
| EN 10216-2 | 13CrMo45        | 0,10-0,17 | 0,40-0,70 | max. 0,35 | 0,025  | 0,020  | max. 0,30               | max. 0,30 | 0,70-1,15 | 0,40-0,60 |           | max. 0,040               |             |                                                                          |            |            |
| EN 10216-2 | X10CrMoVNb9-1   | 0,08-0,12 | 0,30-0,60 | 0,20-0,50 | 0,020  | 0,010  | max. 0,30 <sup>h)</sup> | max. 0,40 | 8,00-9,50 | 0,85-1,05 | 0,18-0,25 | max. 0,040               | 0,03-0,07   | Nb 0,06-0,10                                                             |            |            |
| EN 10216-2 | 14MoV6-3        | 0,10-0,15 | 0,40-0,70 | 0,15-0,35 | 0,025  | 0,020  | max. 0,30               | max. 0,30 | 0,30-0,60 | 0,50-0,70 | 0,22-0,28 | max. 0,040               |             |                                                                          |            |            |
| EN 10216-2 | 20MnNb6         | max. 0,22 | 1,00-1,50 | 0,15-0,35 | 0,025  | 0,020  | max. 0,30               |           |           |           |           | max. 0,060               |             | Nb 0,015-0,10                                                            |            |            |
| EN 10216-2 | 10CrMo5-5       | max. 0,15 | 0,30-0,60 | 0,50-1,00 | 0,025  | 0,020  | max. 0,30               | max. 0,30 | 1,00-1,50 | 0,45-0,65 |           | max. 0,040               |             |                                                                          |            |            |
| EN 10216-2 | 15NiCuMoNb5-6-4 | max. 0,17 | 0,80-1,20 | 0,25-0,50 | 0,025  | 0,020  | 0,50-0,80               | 1,00-1,30 | max. 0,30 | 0,25-0,50 |           | max. 0,050               |             | Nb 0,015-0,045                                                           |            |            |
| EN 10216-2 | 25CrMo4         | 0,22-0,29 | 0,60-0,90 | max. 0,40 | 0,025  | 0,020  | max. 0,30               | max. 0,30 | 0,90-1,20 | 0,15-0,30 |           | max. 0,040               |             |                                                                          |            |            |
| EN 10216-2 | X10CrWMoVNb9-2  | 0,07-0,13 | 0,30-0,60 | max. 0,50 | 0,020  | 0,010  |                         | max. 0,40 | 8,50-9,50 | 0,30-0,60 | 0,15-0,25 | max. 0,040               | 0,030-0,070 | Nb 0,04-0,09<br>B 0,001-0,006<br>W 1,50-2,00                             |            |            |
| EN 10216-3 | P275NL1         | max. 0,16 | 0,50-1,50 | max. 0,40 | 0,025  | 0,020  | max. 0,30               | max. 0,50 | max. 0,30 | max. 0,08 | max. 0,05 | min. 0,020               | max. 0,020  | Nb max. 0,05<br>Ti max. 0,040<br>Cr+Cu+Mo max. 0,45<br>Nb+Ti+V max. 0,05 |            |            |
| EN 10216-3 | P275NL2         | max. 0,16 | 0,50-1,50 | max. 0,40 | 0,025  | 0,015  | max. 0,30               | max. 0,50 | max. 0,30 | max. 0,08 | max. 0,05 | min. 0,020               | max. 0,020  | Nb max. 0,05<br>Ti max. 0,040<br>Cr+Cu+Mo max. 0,45<br>Nb+Ti+V max. 0,05 |            |            |
| EN 10216-3 | P355N           | max. 0,20 | 0,90-1,70 | max. 0,50 | 0,025  | 0,020  | max. 0,30               | max. 0,50 | max. 0,30 | max. 0,08 | max. 0,1  | min. 0,020               | max. 0,02   | Cr+Cu+Mo max. 0,45<br>Nb+Ti+V max. 0,12                                  |            |            |
| EN 10216-3 | P355NH          | max. 0,20 | 0,90-1,70 | max. 0,50 | 0,025  | 0,020  | max. 0,30               | max. 0,50 | max. 0,30 | max. 0,08 | max. 0,10 | min. 0,020               | max. 0,020  | Nb max. 0,05<br>Ti max. 0,040<br>Cr+Cu+Mo max. 0,45<br>Nb+Ti+V max. 0,12 |            |            |
| EN 10216-3 | P355NL1         | max. 0,18 | 0,90-1,70 | Max. 0,50 | 0,025  | 0,020  | max. 0,30               | max. 0,50 | max. 0,30 | max. 0,08 | max. 0,10 | min. 0,020               | max. 0,020  | Nb max. 0,05<br>Ti max. 0,040<br>Cr+Cu+Mo max. 0,45<br>Nb+Ti+V max. 0,12 |            |            |
| EN 10216-3 | P355NL2         | max. 0,18 | 0,90-1,70 | max. 0,50 | 0,025  | 0,015  | max. 0,30               | max. 0,50 | max. 0,30 | max. 0,08 | max. 0,10 | min. 0,020               | max. 0,020  | Nb max. 0,05<br>Ti max. 0,040<br>Cr+Cu+Mo max. 0,45<br>Nb+Ti+V max. 0,12 |            |            |
| EN 10216-3 | P460N           | max. 0,20 | 1,00-1,70 | max. 0,60 | 0,025  | 0,020  | max. 0,70               | max. 0,80 | max. 0,30 | max. 0,10 | max. 0,20 | min. 0,020 <sup>h)</sup> | max. 0,020  | Nb max. 0,05<br>Ti max. 0,040<br>Nb+Ti+V max. 0,22                       |            |            |
| EN 10216-4 | P215NL          | max. 0,15 | 0,40-1,20 | max. 0,35 | 0,025  | 0,020  | max. 0,30               | max. 0,30 | max. 0,30 | max. 0,08 | max. 0,02 | min. 0,020               |             | Nb max. 0,010<br>Ti max. 0,04                                            |            |            |
| EN 10216-4 | P255QL          | max. 0,17 | 0,40-1,20 | max. 0,35 | 0,025  | 0,020  | max. 0,30               | max. 0,30 | max. 0,30 | max. 0,08 | max. 0,02 | min. 0,020               |             | Nb max. 0,010<br>Ti max. 0,04                                            |            |            |
| EN 10216-4 | P265NL          | max. 0,20 | 0,60-1,40 | max. 0,40 | 0,025  | 0,020  | max. 0,30               | max. 0,30 | max. 0,30 | max. 0,08 | max. 0,02 | min. 0,020               |             | Nb max. 0,010<br>Ti max. 0,04                                            |            |            |
| EN 10297-1 | E235            | max. 0,17 | max. 1,20 | max. 0,35 | 0,030  | 0,035  |                         |           |           |           |           |                          |             |                                                                          |            |            |
| EN 10297-1 | E275            | max. 0,21 | max. 1,40 | max. 0,35 | 0,030  | 0,035  |                         |           |           |           |           |                          |             |                                                                          |            |            |
| EN 10297-1 | E315            | max. 0,21 | max. 1,50 | max. 0,30 | 0,030  | 0,035  |                         |           |           |           |           |                          |             |                                                                          |            |            |
| EN 10297-1 | E355            | max. 0,22 | max. 1,60 | max. 0,55 | 0,030  | 0,035  |                         |           |           |           |           |                          |             |                                                                          |            |            |



CHEMICKÉ SLOŽENÍ OCELÍ VYRÁBĚNÝCH DLE ZAHRA NIČNÍCH NOREM

CHEMICAL COMPOSITION OF STEEL GRADES PRODUCED ACCORDING TO FOREIGN STANDARDS

CHEMISCHE ZUSAMMENSETZUNG DER GEMÄSS AUSLÄNDISCHEN NORMEN ERZEUGTEN STÄHLE

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| Norma       | Jakost            | C         | Mn        | Si        | P max. | S max.      | Cu        | Ni        | Cr        | Mo        | V         | Al         | N          | Nb, Ti, B, As a W                              | CEIIW max. | CEPcm max. |
|-------------|-------------------|-----------|-----------|-----------|--------|-------------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------------------------------------------|------------|------------|
| Standard    | Grade             | C         | Mn        | Si        | P max. | S max.      | Cu        | Ni        | Cr        | Mo        | V         | Al         | N          | Nb, Ti, B, As and W                            | CEIIW max. | CEPcm max. |
| Norm        | Güte              | C         | Mn        | Si        | P max. | S max.      | Cu        | Ni        | Cr        | Mo        | V         | Al         | N          | Nb, Ti, B, As und W                            | CEIIW max. | CEPcm max. |
| EN 10297-1  | E355K2            | max. 0,20 | 0,90-1,65 | max. 0,50 | 0,030  | 0,030       | max. 0,35 | max. 0,50 | max. 0,30 | max. 0,10 | max. 0,12 | min. 0,02  | max. 0,015 | Nb, Ti max. 0,05                               |            |            |
| EN 10297-1  | C10E              | 0,07-0,13 | 0,30-0,60 | max. 0,40 | 0,035  | 0,035       |           |           |           |           |           |            |            |                                                |            |            |
| EN 10297-1  | C15E              | 0,12-0,18 | 0,30-0,60 | max. 0,40 | 0,035  | 0,035       |           |           |           |           |           |            |            |                                                |            |            |
| EN 10297-1  | C15R              | 0,12-0,18 | 0,30-0,60 | max. 0,40 | 0,030  | 0,020-0,040 |           |           |           |           |           |            |            |                                                |            |            |
| EN 10297-1  | C22E              | 0,17-0,24 | 0,40-0,70 | max. 0,40 | 0,035  | 0,035       |           |           |           |           |           |            |            |                                                |            |            |
| EN 10297-1  | C35E              | 0,32-0,39 | 0,50-0,80 | max. 0,40 | 0,035  | 0,035       |           |           |           |           |           |            |            |                                                |            |            |
| EN 10297-1  | C45E              | 0,42-0,50 | 0,50-0,80 | max. 0,40 | 0,035  | 0,035       |           | max. 0,40 | max. 0,40 | max. 0,10 |           |            |            |                                                |            |            |
| EN 10297-1  | C60E              | 0,57-0,65 | 0,60-0,90 | max. 0,40 | 0,035  | 0,035       |           | max. 0,40 | max. 0,40 | max. 0,1  |           |            |            | Cr+Mo+Ni max. 0,63                             |            |            |
| EN 10297-1  | E470              | 0,16-0,22 | 1,30-1,70 | 0,10-0,50 | 0,030  | 0,035       |           |           |           |           | 0,08-0,15 | min. 0,01  | max. 0,020 | Nb max. 0,07                                   |            |            |
| EN 10297-1  | 41Cr4             | 0,38-0,45 | 0,60-0,90 | max. 0,40 | 0,035  | 0,035       |           |           | 0,90-1,20 |           |           |            |            |                                                |            |            |
| EN 10297-1  | 25CrMo4           | 0,22-0,29 | 0,60-0,90 | max. 0,40 | 0,035  | 0,035       |           |           | 0,90-1,20 | 0,15-0,30 |           |            |            |                                                |            |            |
| EN 10297-1  | 34CrMo4           | 0,30-0,37 | 0,60-0,90 | max. 0,40 | 0,035  | 0,035       |           |           | 0,90-1,20 | 0,15-0,30 |           |            |            |                                                |            |            |
| EN 10297-1  | 42CrMo4           | 0,38-0,45 | 0,60-0,90 | max. 0,40 | 0,035  | 0,035       |           |           | 0,90-1,20 | 0,15-0,30 |           |            |            |                                                |            |            |
| EN 2097-1   | 20MnV6*           | 0,16-0,22 | 1,30-1,70 | 0,10-0,50 | 0,035  | 0,035       |           | max. 0,40 | max. 0,40 | max. 0,20 | 0,10-0,20 |            | max. 0,20  |                                                |            |            |
| EN 2097-1   | 30G2*             | 0,27-0,36 | 1,40-1,80 | 0,17-0,37 | 0,035  | 0,035       |           | max. 0,30 | max. 0,25 |           |           |            |            |                                                |            |            |
| EN 10297-1  | E420J2            | 0,16-0,22 | 1,30-1,70 | 0,10-0,50 | 0,030  | 0,035       | 0,3       | 0,4       | 0,3       | 0,08      | 0,08-0,15 | min. 0,010 | max. 0,020 | Ti max. 0,05<br>Nb max. 0,07<br>Nb+V max. 0,20 |            |            |
| EN 10297-1  | E460K2            | max. 0,22 | 1,00-1,70 | max. 0,60 | 0,030  | 0,030       | 0,7       | 0,8       | 0,3       | 0,1       | 0,2       | min. 0,020 | max. 0,025 | Ti max. 0,05<br>Nb max. 0,07<br>Nb+V max. 0,20 |            |            |
| EN 10297-1  | E590K2            | 0,16-0,22 | 1,30-1,70 | 0,10-0,50 | 0,030  | 0,035       | 0,3       | 0,4       | 0,3       | 0,08      | 0,08-0,15 | min. 0,010 | max. 0,020 | Ti max. 0,05<br>Nb max. 0,07<br>Nb+V max. 0,20 |            |            |
| NF A49-311  | TU 37-b           | max. 0,18 | max. 0,75 | max. 0,35 | 0,040  | 0,040       |           |           |           |           |           |            |            |                                                |            |            |
| NF A49-213  | TU 37-c           | max. 0,16 | 0,35-0,75 | 0,06-0,30 | 0,035  | 0,035       | 0,25      |           |           |           |           |            |            | Sn max. 0,03                                   |            |            |
| NF A49-311  | TU 52-b           | max. 0,20 | max. 1,50 | max. 0,50 | 0,040  | 0,040       |           |           |           |           |           |            |            |                                                |            |            |
| NF A49-211  | TU E 220(B,B1,B2) | max. 0,15 | max. 0,80 | max. 0,30 | 0,025  | 0,025       |           |           |           |           |           |            |            |                                                |            |            |
| NF A49-211  | TU E 250(B,B1,B2) | max. 0,21 | max. 1,00 | max. 0,35 | 0,025  | 0,025       |           |           |           |           |           |            |            |                                                |            |            |
| NF A49-211  | TU E 275(B,B1,B2) | max. 0,23 | max. 1,35 | max. 0,40 | 0,025  | 0,025       |           |           |           |           |           |            |            |                                                |            |            |
| NF A 49-112 | TU E 220A         | max. 0,18 | max. 0,75 | 0,35      | 0,040  | 0,040       |           |           |           |           |           |            |            |                                                |            |            |

## VYSVĚTLIVKY

## LEGEND

## ERLÄUTERUNGEN

Vyrábíme po dohodě.

Special agreement necessary.

Wir fertigen im begrenzten Umfang und nur nach Vereinbarung.

## POZNÁMKA

## NOTICE

## VERMERK

\* K těmto jakostem přiřazena výroba dle EN 10297-1.

\* Production acc. to EN 10297-1 allocated to these grades.

\* Zu diesen Qualitäten ist die Produktion nach EN 10297-1 angepasst.



|                                                               |                                                                               |                                                                            |
|---------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                        | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                                       | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM                                    |
| MECHANICKÉ VLASTNOSTI OCELÍ VYRÁBĚNÝCH DLE ZAHRANIČNÍCH NOREM | MECHANICAL PROPERTIES OF STEEL GRADES PRODUCED ACCORDING TO FOREIGN STANDARDS | MECHANISCHE EIGENSCHAFTEN DER GEMÄSS AUSLÄNDISCHEN NORMEN ERZEUGTEN STÄHLE |
|                                                               |                                                                               |                                                                            |

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| MECHANICKÉ VLASTNOSTI OCELÍ<br>VYRÁBĚNÝCH DLE ZAHRANIČNÍCH<br>NOREM |                  |                       | MECHANICAL PROPERTIES OF STEEL<br>GRADES PRODUCED ACCORDING<br>FOREIGN STANDARDS |                   |                 |             |               | MECHANISCHE EIGENSCHAFTEN DER<br>GEMÄSS AUSLÄNDISCHEN NORMEN<br>ERZEUGTEN STÄHLE                                                                               |            |                               |
|---------------------------------------------------------------------|------------------|-----------------------|----------------------------------------------------------------------------------|-------------------|-----------------|-------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------|
| Norma                                                               | Jakost           | Tepelné<br>zpracování | Re min. (MPa)                                                                    |                   |                 | Rm<br>(MPa) | A5min.<br>(%) | KV<br>(J)                                                                                                                                                      | HB<br>max. | Teplota použití               |
|                                                                     |                  |                       | t do 16<br>mm                                                                    | t 16 – 40<br>mm   | t 40 – 65<br>mm |             |               |                                                                                                                                                                |            |                               |
| Standard                                                            | Grade            | Heat treatment        | Re min. (MPa)                                                                    |                   |                 | Rm<br>(MPa) | A5min.<br>(%) | KV<br>(J)                                                                                                                                                      | HB<br>max. | Temperature of<br>application |
|                                                                     |                  |                       | t up to 16<br>mm                                                                 | t 16 – 40<br>mm   | t 40 – 65<br>mm |             |               |                                                                                                                                                                |            |                               |
| Norm                                                                | Güte             | Wärme-<br>behandlung  | Re min. (MPa)                                                                    |                   |                 | Rm<br>(MPa) | A5min.<br>(%) | KV<br>(J)                                                                                                                                                      | HB<br>max. | Verwendungs-<br>Temperatur    |
|                                                                     |                  |                       | t bis 16<br>mm                                                                   | t 16 – 40<br>mm   | t 40 – 65<br>mm |             |               |                                                                                                                                                                |            |                               |
| API Spec. 5 CT                                                      | H-40             | U                     |                                                                                  | od 20:<br>276-552 | 276-552         | min. 414    | vz. API       |                                                                                                                                                                |            | 20                            |
| API Spec. 5 CT                                                      | J-55             | U,N                   | 379-552                                                                          | 379-552           | 379-552         | min. 517    | vz. API       |                                                                                                                                                                |            | 20                            |
| API Spec. 5 CT                                                      | K-55             | U,N                   | 379-552                                                                          | 379-552           | 379-552         | min. 655    | vz. API       |                                                                                                                                                                |            | 20                            |
| API Spec. 5 CT                                                      | L-80 Typ1        | Z                     | 552-655                                                                          | 552-655           |                 | min. 655    | vz. API       | směr T,L a min.hodn. KV závislá na D a t<br>direction T, L and min. value KV dependent on D and t<br>Probenlage T oder L und Mindestwert abhängig vom D und t. | 241        | 20                            |
| API Spec. 5 CT                                                      | N-80             | Q                     | 552-758                                                                          | 552-758           |                 | min. 689    | vz. API       | směr T,L a min.hodn. KV závislá na D a t<br>direction T, L and min. value KV dependent on D and t<br>Probenlage T oder L und Mindestwert abhängig vom D und t. |            | 20                            |
| API Spec. 5 CT                                                      | N-80 TYP1        | U,N                   | 552-758                                                                          | 552-758           |                 | min. 689    | vz. API       |                                                                                                                                                                |            | 20                            |
| API Spec. 5 L                                                       | A (L210)-PSL1    | U,N                   | 210                                                                              | 210               | 210             | min. 335    | vz. API       |                                                                                                                                                                |            | 20                            |
| API Spec. 5 L                                                       | B(L245)-PSL1     | U,N                   | 245                                                                              | 245               | 245             | min. 415    | vz. API       |                                                                                                                                                                |            | 20                            |
| API Spec. 5 L                                                       | BN(L245N)-PSL2   | U,N                   | 245-450                                                                          | 245-450           |                 | 415-760     | vz. API       | T=27(0°C); L=41(0°C)                                                                                                                                           |            |                               |
| API Spec. 5 L                                                       | X42(L290)-PSL1   | U,N                   | 290                                                                              | 290               | 290             | min. 415    | vz. API       |                                                                                                                                                                |            | 20                            |
| API Spec. 5 L                                                       | X42N(L290N)-PSL2 | U,N                   | 290-495                                                                          | 290-496           |                 | 415-760     | vz. API       | T=27(0°C); L=41(0°C)                                                                                                                                           |            |                               |
| API Spec. 5 L                                                       | X46(L320)-PSL1   | U,N                   | 320                                                                              | 320               | 320             | min. 435    | vz. API       |                                                                                                                                                                |            | 20                            |
| API Spec. 5 L                                                       | X46N(L320N)-PSL2 | U,N                   | 320-525                                                                          | 320-525           |                 | 435-760     | vz. API       | T=27(0°C); L=41(0°C)                                                                                                                                           |            |                               |
| API Spec. 5 L                                                       | X52(L360)-PSL1   | U,N                   | 360                                                                              | 360               | 360             | min. 460    | vz. API       |                                                                                                                                                                |            | 20                            |
| API Spec. 5 L                                                       | X52N(L360N)-PSL2 | U,N                   | 360-530                                                                          | 360-530           |                 | 460-760     | vz. API       | T=27(0°C); L=41(0°C)                                                                                                                                           |            |                               |
| API Spec. 5 L                                                       | X56(L390)-PSL1   | U,N                   | 390                                                                              | 390               | 390             | min. 490    | vz. API       |                                                                                                                                                                |            | 20                            |
| API Spec. 5 L                                                       | X56N(L390N)-PSL2 | U,N                   | 390-545                                                                          | 390-545           |                 | 490-760     | vz. API       | T=27(0°C); L=41(0°C)                                                                                                                                           |            |                               |
| API Spec. 5 L                                                       | X60(L415)-PSL1   | U,N                   | 415                                                                              | 415               | 415             | min. 520    | vz. API       |                                                                                                                                                                |            | 20                            |
| API Spec. 5 L                                                       | X60N(L415N)-PSL2 | U,N                   | 415-565                                                                          | 415-565           |                 | 520-760     | vz. API       | T=27(0°C); L=41(0°C)                                                                                                                                           |            |                               |
| ASTM A53                                                            | Gr. A            | U,N                   | 205                                                                              | 205               | 205             | min. 330    | vz.ASTM       |                                                                                                                                                                |            | 20                            |
| ASTM A53                                                            | Gr. B            | U,N                   | 240                                                                              | 240               | 240             | min. 415    | vz.ASTM       |                                                                                                                                                                |            | 20                            |
| ASTM A106                                                           | Gr. A            | U,N                   | 205                                                                              | 205               | 205             | min. 330    | 35            |                                                                                                                                                                |            | 475                           |
| ASTM A106                                                           | Gr. B            | U,N                   | 240                                                                              | 240               | 240             | min. 415    | 30            |                                                                                                                                                                |            | 475                           |
| ASTM A106                                                           | Gr. C            | U,N                   | 275                                                                              | 275               | 275             | min. 485    | 30            |                                                                                                                                                                |            | 20                            |
| ASTM A333                                                           | Gr. 1            | U,N                   | 205                                                                              | 205               | 205             | min. 380    | 35            | L=18 (– 45°C)                                                                                                                                                  |            | – 50                          |
| ASTM A333                                                           | Gr. 6            | U,N                   | 240                                                                              | 240               | 240             | min. 415    | 30            | L=18 (– 45°C)                                                                                                                                                  |            | – 50                          |
| ASTM A335                                                           | P. 1             | N                     | 205                                                                              | 205               | 205             | min. 380    | 30            |                                                                                                                                                                |            | 530                           |
| ASTM A335                                                           | P. 11            | Z                     | 205                                                                              | 205               | 205             | min. 415    | 30            |                                                                                                                                                                |            | 560                           |
| ASTM A335                                                           | P. 12            | Z                     | 220                                                                              | 220               | 220             | min. 415    | 30            |                                                                                                                                                                |            | 560                           |
| ASTM A335                                                           | P. 2             | Z                     | 205                                                                              | 205               | 205             | min. 380    | 30            |                                                                                                                                                                |            | 560                           |
| ASTM A335                                                           | P. 22            | Z                     | 205                                                                              | 205               | 205             | min. 415    | 30            |                                                                                                                                                                |            | 560                           |
| ASTM A335                                                           | P. 5             | Z                     | 205                                                                              | 205               | 205             | min. 415    | 30            |                                                                                                                                                                |            | 600                           |
| ASTM A335                                                           | P. 91            | Z                     | 415                                                                              | 415               | 415             | min. 585    | 20            |                                                                                                                                                                | 250        | 650                           |
| DIN                                                                 | X10CrMoVb91      | Z                     | 415                                                                              | 415               | 415             | 585-850     | 17            | L=68                                                                                                                                                           | 250        | 650                           |
| DIN                                                                 | St 52.0V         | Z                     | –                                                                                | –                 | –               | –           | –             |                                                                                                                                                                | min.270    | 20                            |
| DIN                                                                 | St 52.0 MEC      | U                     | 355                                                                              | 355               | 355             | 500-640     | 18            |                                                                                                                                                                |            | 20                            |
| DIN 1629                                                            | St 37.0          | U,N                   | 235                                                                              | 225               | 215             | 350-480     | 25            |                                                                                                                                                                |            | 300                           |
| DIN 1629                                                            | St 44.0          | U,N                   | 275                                                                              | 265               | 225             | 420-550     | 21            |                                                                                                                                                                |            | 300                           |
| DIN 1629                                                            | St 52.0          | U,N                   | 355                                                                              | 345               | 335             | 500-650     | 21            |                                                                                                                                                                |            | 300                           |
| DIN 1630                                                            | St 37.4          | U,N                   | 235                                                                              | 225               | 215             | 350-480     | 25            | T=27; L=43                                                                                                                                                     |            | 300                           |
| DIN 1630                                                            | St 44.4          | U,N                   | 275                                                                              | 265               | 255             | 420-550     | 21            | T=27; L=43                                                                                                                                                     |            | 300                           |
| DIN 1630                                                            | St 52.4          | U,N                   | 355                                                                              | 345               | 335             | 500-650     | 21            | T=27; L=43                                                                                                                                                     |            | 300                           |
| DIN 17 100                                                          | ZSt 60-2         | U,N                   | 335                                                                              | 325               | 325             | 570-710     | 16            |                                                                                                                                                                |            | 20                            |
| DIN 17 100                                                          | St 60-2          | U,N                   | 335                                                                              | 325               | 325             | 570-710     | 16            |                                                                                                                                                                |            | 20                            |
| DIN 17 121                                                          | RSt 37-2         | U,N                   | 235                                                                              | 225               | 215             | 340-470     | 26            | L=27                                                                                                                                                           |            | 300                           |
| DIN 17 121                                                          | St 37-3          | U,N                   | 235                                                                              | 225               | 215             | 340-470     | 26            | L=27(– 20°C)                                                                                                                                                   |            | 300                           |
| DIN 17 121                                                          | St 44-2          | U,N                   | 275                                                                              | 265               | 255             | 410-540     | 22            | L=27                                                                                                                                                           |            | 300                           |
| DIN 17 121                                                          | St 44-3 U,N      | U,N                   | 275                                                                              | 265               | 255             | 410-540     | 22            | L=27(– 20°C)                                                                                                                                                   |            | 300                           |
| DIN 17 121                                                          | St 52-3 U,N      | U,N                   | 355                                                                              | 345               | 335             | 490-630     | 22            | L=27(– 20°C)                                                                                                                                                   |            | 300                           |
| DIN 17172                                                           | StE 210.7        | U,N                   | 210                                                                              | 210               | 210             | 320-440     | 28            | L=47(0°C)                                                                                                                                                      |            | 20                            |
| DIN 17172                                                           | StE 240.7        | U,N                   | 240                                                                              | 240               | 240             | 370-490     | 26            | L=47(0°C)                                                                                                                                                      |            | 20                            |
| DIN 17172                                                           | StE 290.7        | U,N                   | 290                                                                              | 290               | 290             | 420-540     | 25            | L=47(0°C)                                                                                                                                                      |            | 20                            |
| DIN 17172                                                           | StE 320.7        | U,N                   | 320                                                                              | 320               | 320             | 460-580     | 23            | L=47(0°C)                                                                                                                                                      |            | 20                            |
| DIN 17172                                                           | StE 360.7        | U,N                   | 360                                                                              | 360               | 360             | 510-630     | 22            | L=47(0°C)                                                                                                                                                      |            | 20                            |


MECHANICKÉ VLASTNOSTI OCELÍ VYRÁBĚNÝCH DLE  
ZAHRAČIČNÍCH NOREM

MECHANICAL PROPERTIES OF STEEL GRADES  
PRODUCED ACCORDING TO FOREIGN STANDARDS

MECHANISCHE EIGENSCHAFTEN DER GEMÄSS  
AUSLÄNDISCHEN NORMEN ERZEUGTEN STÄHLE

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| Norma      | Jakost     | Tepelné<br>zpracování | Re min. (MPa)                        |                         |                 | Rm<br>(MPa) | A5min.<br>(%) | KV<br>(J)            | HB<br>max. | Teplota použití               |
|------------|------------|-----------------------|--------------------------------------|-------------------------|-----------------|-------------|---------------|----------------------|------------|-------------------------------|
|            |            |                       | t do 16<br>mm                        | t 16 – 40<br>mm         | t 40 – 65<br>mm |             |               |                      |            |                               |
| Standard   | Grade      | Heat treatment        | Re min. (MPa)                        |                         |                 | Rm<br>(MPa) | A5min.<br>(%) | KV<br>(J)            | HB<br>max. | Temperature of<br>application |
|            |            |                       | t up to 16<br>mm                     | t 16 – 40<br>mm         | t 40 – 65<br>mm |             |               |                      |            |                               |
| Norm       | Güte       | Wärme-<br>behandlung  | Re min. (MPa)                        |                         |                 | Rm<br>(MPa) | A5min.<br>(%) | KV<br>(J)            | HB<br>max. | Verwendungs-<br>Temperatur    |
|            |            |                       | t bis 16<br>mm                       | t 16 – 40<br>mm         | t 40 – 65<br>mm |             |               |                      |            |                               |
| DIN 17 173 | TTSt 35N   | N                     | ≤ 10: 225                            | –                       | –               | 360-460     | 25            | L=40(– 40°C)         |            |                               |
| DIN 17 173 | TTSt 35V   | Z                     | 255                                  | ≤ 25: 235               | –               | 360-490     | 23            | L=40(– 50°C)         |            |                               |
| DIN 17175  | St 35.8    | U,N                   | 235                                  | 225                     | 215             | 360-480     | 25            | T=34; L=48           |            | 475                           |
| DIN 17175  | St 45.8    | U,N                   | 255                                  | 245                     | 235             | 410-530     | 21            | T=27; L=41           |            | 475                           |
| DIN 17175  | 10CrMo910  | Z                     | 280                                  | 280                     | 270             | 450-600     | 20            | T=34; L=48           |            | 600                           |
| DIN 17175  | 13CrMo44   | Z                     | ≤ 10: 305<br>10-16: 290              | 290                     | 280             | 440-590     | 22            | T=34; L=48           |            | 560                           |
| DIN 17175  | 14MoV63    | Z                     | 320                                  | 320                     | 310             | 460-610     | 20            | T=41; L=55           |            | 600                           |
| DIN 17175  | 15Mo3      | U,N                   | ≤ 10: 285<br>10-16: 270              | 270                     | 260             | 450-600     | 22            | T=34; L=48           |            | 500                           |
| DIN 17176  | 12CrMo19 5 | Z                     | 390                                  | 390                     | 390             | 570-740     | 18            | T=39; L=55           |            | 500                           |
| DIN 17204  | 25CrMo4    | Z                     | ≤ 8: 700<br>≥ 8: 600                 | ≤ 20: 600<br>20-50: 450 | ≤ 60: 450       | 900-1100    | 14            | L=50                 |            | 20                            |
| DIN 17204  | 34CrMo4    | Z                     | ≤ 8: 800<br>≥ 8: 650                 | ≤ 20: 650<br>20-50: 550 | ≤ 60: 500       | 900-1100    | 12            | L=40                 |            | 20                            |
| DIN 17204  | 41Cr4      | Z                     | ≤ 8: 800<br>≥ 8: 660                 | ≤ 20: 660<br>20-50: 560 | ≤ 50: 560       | 900-1100    | 12            | L=35                 |            | 20                            |
| DIN 17204  | 41Cr4      | G                     | –                                    | –                       | –               |             |               |                      | 241        | 20                            |
| DIN 17204  | C 22       | U,N                   | 260                                  | 240                     | 220             | 420-550     | 24            |                      |            | 20                            |
| DIN 17204  | C 35       | U,N                   | 300                                  | 280                     | 270             | 520-670     | 21            |                      |            | 20                            |
| DIN 17204  | C 45       | U,N                   | 350                                  | 330                     | 320             | 640-760     | 17            |                      |            | 20                            |
| DIN 17204  | C 55       | N                     | 370                                  | 350                     | 340             | 670-820     | 15            |                      |            | 20                            |
| DIN 17204  | C 60       | N                     | 390                                  | 370                     | 360             | 720-900     | 14            |                      |            | 20                            |
| DIN 17204  | Ck 22      | U,N                   | 260                                  | 240                     | 220             | 420-550     | 24            |                      |            | 20                            |
| DIN 17204  | Ck 35      | U,N                   | 300                                  | 280                     | 270             | 520-670     | 21            |                      |            | 20                            |
| DIN 17204  | Ck 45      | U,N                   | 350                                  | 330                     | 320             | 640-760     | 17            |                      |            | 20                            |
| DIN 17204  | Ck 55      | N                     | 370                                  | 350                     | 340             | 670-820     | 15            |                      |            | 20                            |
| DIN 17204  | Ck 60      | N                     | 390                                  | 370                     | 360             | 720-900     | 14            |                      |            | 20                            |
| DIN 17210  | C 10       | U                     | –                                    | –                       | –               | –           | –             |                      | 131        | 20                            |
| DIN 17210  | C 15       | U                     | –                                    | –                       | –               | –           | –             |                      | 143        | 20                            |
| DIN 17210  | Ck 10      | U                     | –                                    | –                       | –               | –           | –             |                      | 131        | 20                            |
| DIN 17210  | Ck 15      | U                     | –                                    | –                       | –               | –           | –             |                      | 143        | 20                            |
| EN 10208-2 | L 245 NB   | U,N                   | ≤ 25: R <sub>t0.5</sub> =<br>245-440 |                         | –               | min.415     | 24            | T=40(0°C); L=60(0°C) |            | 20                            |
| EN 10208-2 | L 290 NB   | U,N                   | ≤ 25: R <sub>t0.5</sub> =<br>290-440 |                         | –               | min.415     | 23            | T=40(0°C); L=60(0°C) |            | 20                            |
| EN 10208-2 | L 360 NB   | U,N                   | ≤ 25: R <sub>t0.5</sub> =<br>360-510 |                         | –               | min.460     | 22            | T=40(0°C); L=60(0°C) |            | 20                            |
| EN 10208-2 | L 415 NB   | U,N                   | ≤ 25: R <sub>t0.5</sub> =<br>415-565 |                         | –               | min. 520    | 20            | T=40(0°C); L=60(0°C) |            | 20                            |
| EN 10210-1 | S235JRH    | U,N                   | 235                                  | 225                     | 215             | 360-510     | 26            | L=27                 |            | 20                            |
| EN 10210-1 | S275J0H    | U,N                   | 275                                  | 265                     | 255             | 410-560     | 23            | L=27(0°C)            |            | 20                            |
| EN 10210-1 | S275J2H    | U,N                   | 275                                  | 265                     | 255             | 410-560     | 23            | L=27(– 20°C)         |            | 300                           |
| EN 10210-1 | S355J0H    | U,N                   | 355                                  | 345                     | 335             | 470-630     | 22            | L=27(0°C)            |            | 20                            |
| EN 10210-1 | S355J2H    | U,N                   | 355                                  | 345                     | 335             | 470-630     | 22            | L=27(– 20°C)         |            | 300                           |
| EN 10210-1 | S355K2H    | U,N                   | 355                                  | 345                     | 335             | 470-630     | 22            | L=40(– 20°C)         |            | 300                           |
| EN 10210-1 | S275NH     | U,N                   | 275                                  | 265                     | 255             | 370-510     | 24            | L=40(– 20°C)         |            | 300                           |
| EN 10210-1 | S275NLH    | U,N                   | 275                                  | 265                     | 255             | 370-510     | 24            | L=27(– 50°C)         |            | 300                           |
| EN 10210-1 | S355NH     | U,N                   | 355                                  | 345                     | 335             | 470-630     | 22            | L=40(– 20°C)         |            | 300                           |
| EN 10210-1 | S355NLH    | U,N                   | 355                                  | 345                     | 335             | 470-630     | 22            | L=27(– 50°C)         |            | 300                           |
| EN 10210-1 | S420NH     | U,N                   | 420                                  | 400                     | 390             | 520-680     | 19            | L=40(– 20°C)         |            | 300                           |
| EN 10210-1 | S420NLH    | U,N                   | 420                                  | 400                     | 390             | 520-680     | 19            | L=27(– 50°C)         |            | 300                           |
| EN 10210-1 | S460NH     | U,N                   | 460                                  | 440                     | 430             | 540-720     | 17            | L=40(– 20°C)         |            | 300                           |

| VYSVĚTLIVKY                                                                                                                     | LEGEND                                                                                                                                     | ERLÄUTERUNGEN                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| t – tloušťka stěny<br>D – vnější průměr<br>T – příčný<br>L – podélný                                                            | t – wall thickness<br>D – outside diameter<br>T – transverse<br>L – longitudinal                                                           | t – Wanddicke<br>D – Außendurchmesser<br>T – quer<br>L – längs                                                                                      |
| TEPELNÉ ZPRACOVÁNÍ                                                                                                              | HEAT TREATMENT                                                                                                                             | WÄRMEBEHANDLUNG                                                                                                                                     |
| U – bez tepelného zpracování<br>N – normalizační žiháno<br>G – žiháno na měkko<br>Z – zušlechťeno                               | U – without heat treatment<br>N – normalizing<br>G – soft annealing<br>Z – quenching and tempering                                         | U – ohne Wärmebehandlung<br>N – Normalglühen<br>G – Weichglühen<br>Z – Härten und Anlassen                                                          |
| A5 MIN.                                                                                                                         | A5 MIN.                                                                                                                                    | A5 MIN.                                                                                                                                             |
| vz (vzorec)                                                                                                                     | according to                                                                                                                               | gemäss                                                                                                                                              |
| POZNÁMKA                                                                                                                        | NOTICE                                                                                                                                     | VERMERK                                                                                                                                             |
| – uvedené min. hodnoty KV platí pro plný vzorek (10x10 mm)<br>– u hodnot KV bez uvedené teploty se provádějí zkoušky při + 20°C | – stated min. KV values apply to a full sample (10x10 mm)<br>– testing at + 20°C is carried out where the KV value has no temperature data | – angenannte minimum KV Werte gölten für den ganzen Muster<br>– bei KV Werten ( ohne angenannte Temperaturen ) sind die Probenbei + 20 durchgeführt |
| Vyrábíme po dohodě.                                                                                                             | Special agreement necessary.                                                                                                               | Wir fertigen im begrenzten Umfang und nur nach Vereinbarung.                                                                                        |



|                                                               |                                                                               |                                                                            |
|---------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| OCÉLOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                        | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                                       | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM                                    |
| MECHANICKÉ VLASTNOSTI OCELÍ VYRÁBĚNÝCH DLE ZAHRANIČNÍCH NOREM | MECHANICAL PROPERTIES OF STEEL GRADES PRODUCED ACCORDING TO FOREIGN STANDARDS | MECHANISCHE EIGENSCHAFTEN DER GEMÄSS AUSLÄNDISCHEN NORMEN ERZEUGTEN STÄHLE |
|                                                               |                                                                               |                                                                            |

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| Norma      | Jakost          | Tepelné zpracování | Re min. (MPa)                                                                   |              |              | Rm (MPa)                              | A5min. (%) | KV (J)                       | HB max. | Teplota použití            |
|------------|-----------------|--------------------|---------------------------------------------------------------------------------|--------------|--------------|---------------------------------------|------------|------------------------------|---------|----------------------------|
|            |                 |                    | t do 16 mm                                                                      | t 16 – 40 mm | t 40 – 65 mm |                                       |            |                              |         |                            |
| Standard   | Grade           | Heat treatment     | Re min. (MPa)                                                                   |              |              | Rm (MPa)                              | A5min. (%) | KV (J)                       | HB max. | Temperature of application |
| Norm       | Güte            | Wärmebehandlung    | Re min. (MPa)                                                                   |              |              | Rm (MPa)                              | A5min. (%) | KV (J)                       | HB max. | Verwendungs-Temperatur     |
|            |                 |                    | t bis 16 mm                                                                     | t 16 – 40 mm | t 40 – 65 mm |                                       |            |                              |         |                            |
| EN 10210-1 | S460NLH         | U,N                | 460                                                                             | 440          | 430          | 540-720                               | 17         | L=27(– 50°C)                 |         | 300                        |
| EN 10216-1 | P195TR1         | U,N                | 195                                                                             | 185          | 175          | 320-440                               | 27         |                              |         |                            |
| EN 10216-1 | P195TR2         | U,N                | 195                                                                             | 185          | 175          | 320-440                               | 27         | T=27(0°C); L=40(0°C)         |         |                            |
| EN 10216-1 | P235TR1         | U,N                | 235                                                                             | 225          | 215          | 360-500                               | 25         |                              |         |                            |
| EN 10216-1 | P235TR2         | U,N                | 235                                                                             | 225          | 215          | 360-500                               | 25         | T=27(0°C); L=40(0°C)         |         |                            |
| EN 10216-1 | P265TR1         | U,N                | 265                                                                             | 255          | 245          | 410-570                               | 21         |                              |         |                            |
| EN 10216-1 | P265TR2         | U,N                | 265                                                                             | 255          | 245          | 410-570                               | 21         | T=27(0°C); L=40(0°C)         |         |                            |
| EN 10216-2 | P195GH          | U,N                | 195                                                                             | –            | –            | 320-440                               | 27         | T=27(0°C); L=40(0°C)         |         |                            |
| EN 10216-2 | P235GH          | U,N                | 235                                                                             | 225          | 215          | 360-500                               | 25         | T=27(0°C); L=40(0°C)         |         |                            |
| EN 10216-2 | P265GH          | U,N                | 265                                                                             | 255          | 245          | 410-570                               | 23         | T=27(0°C); L=40(0°C)         |         |                            |
| EN 10216-2 | 16Mo3           | U,N                | 280                                                                             | 270          | 260          | 450-600                               | 22         | T=27(20°C);L=40(20°C)        |         |                            |
| EN 10216-2 | 13CrMo45        | Z                  | 290                                                                             | 290          | 280          | 440-590                               | 22         | T=27(20°C);L=40(20°C)        |         |                            |
| EN 10216-2 | 10CrMo9-10      | Z                  | 280                                                                             | 280          | 270          | 480-630                               | 22         | T=27(20°C);L=40(20°C)        |         |                            |
| EN 10216-2 | 11CrMo9-10      | Z                  | 355                                                                             | 355          | 355          | 540-680                               | 20         | T=27(20°C);L=40(20°C)        |         |                            |
| EN 10216-2 | X10CrMoVNb9-1   | Z                  | 450                                                                             | 450          | 450          | 630-830                               | 19         | T=27(20°C);L=40(20°C)        |         |                            |
| EN 10216-2 | 14MoV6-3        | Z                  | 320                                                                             | 320          | 310          | 450-610                               | 20         | T=27(20°C);L=40(20°C)        |         |                            |
| EN 10216-2 | 20MnNb6         | N                  | 355                                                                             | 345          | 335          | 500-650                               | 22         | T=27(0°C);L=40(0°C)          |         |                            |
| EN 10216-2 | 10CrMo5-5       | Z                  | 275                                                                             | 275          | 265          | 410-560                               | 22         | T=27(20°C);L=40(20°C)        |         |                            |
| EN 10216-2 | 15NiCuMoNb5-6-4 | Z                  | 440                                                                             | 440          | 440          | 610-780                               | 19         | T=27(20°C);L=40(20°C)        |         |                            |
| EN 10216-2 | 25CrMo4         | Z                  | 345                                                                             | 345          | 345          | 540-690                               | 18         | T=27(20°C);L=40(20°C)        |         |                            |
| EN 10216-2 | X10CrWMoVNb9-2  | Z                  | 440                                                                             | 440          | 440          | 620-850                               | 19         | T=27(20°C);L=40(20°C)        |         |                            |
| EN 10216-3 | P275NL1         | N                  | 275                                                                             | 275          | 40-50: 265   | 390-510                               | 24         | T=27(– 40°C); L=40(– 40°C)   |         |                            |
| EN 10216-3 | P275NL2         | N                  | 275                                                                             | 275          | 40-50: 265   | 390-510                               | 24         | T=27(– 50°C); L=40(– 50°C)   |         |                            |
| EN 10216-3 | P355N           | N                  | ≤ 20: 355                                                                       | 20-40: 345   | 40-50: 335   | 490-650                               | 22         | T=27(– 20°C); L=40(– 20°C)   |         |                            |
| EN 10216-3 | P355NH          | N                  | ≤ 20: 355                                                                       | 20-40: 345   | 40-50: 335   | 490-650                               | 22         | T=27(– 20°C); L=40(– 20°C)   |         |                            |
| EN 10216-3 | P355NL1         | N                  | ≤ 20: 355                                                                       | 20-40: 345   | 40-50: 335   | 490-650                               | 22         | T=27(– 40°C); L=40(– 40°C)   |         |                            |
| EN 10216-3 | P355NL2         | N                  | ≤ 20: 355                                                                       | 20-40: 345   | 40-50: 335   | 490-650                               | 22         | T=27(– 50°C); L=40(– 50°C)   |         |                            |
| EN 10216-3 | P460N           | U,N                | ≤ 12: 460<br>≥ 12: 450                                                          | 20-40: 440   | 40-50: 425   | 560-730                               | 19         | T=27(– 20°C); L=40(– 20°C)   |         |                            |
| EN 10216-4 | P215NL          | N                  | ≤ 10: 215                                                                       | –            | –            | 360-480                               | 25         | L=40(– 40°C)                 |         |                            |
| EN 10216-4 | P255QL          | Z                  | 255                                                                             | 255          | 255          | 360-490                               | 23         | T=27(– 50°C); L=40(– 50°C)   |         |                            |
| EN 10216-4 | P265NL          | N                  | ≤ 25: 265                                                                       |              | –            | 410-570                               | 24         | T=27(– 40°C); L=40(– 40°C)   |         |                            |
| EN 10297-1 | E235            | U,N                | 235                                                                             | 225          | 215          | min. 360                              | 25         |                              |         |                            |
| EN 10297-1 | E275            | U,N                | 275                                                                             | 265          | 255          | min. 410                              | 22         |                              |         |                            |
| EN 10297-1 | E315            | U,N                | 315                                                                             | 305          | 295          | min. 450                              | 21         |                              |         |                            |
| EN 10297-1 | E355            | U,N                | 355                                                                             | 345          | 335          | min. 490                              | 20         |                              |         |                            |
| EN 10297-1 | E355K2          | U,N                | 355                                                                             | 345          | 335          | ≤ 40: 490<br>40-65: 470               | 20         | T=27J(– 20°C); L=40J(– 20°C) |         |                            |
| EN 10297-1 | E470            | U, N               | 470                                                                             | 430          | –            | ≤ 16: 650<br>16-40: 600               | 17         |                              |         |                            |
| EN 10297-1 | E420J2          | U,N                | 420                                                                             | 400          | 390          | ≤ 16: 600<br>16-40: 560<br>40-65: 530 | 19         | T=20J(– 20°C); L=27(– 20°C)  |         |                            |
| EN 10297-1 | E460K2          | N                  | 460                                                                             | 440          | 430          | min. 550                              | 19         | T=27J(– 20°C); L=40J(– 20°C) |         |                            |
| EN 10297-1 | E590K2          | Z                  | 590                                                                             | 540          | 480          | ≤ 16: 700<br>16-40: 650<br>40-65: 570 | 16         | T=27J(– 20°C); L=40J(– 20°C) |         |                            |
| EN 10297-1 | 20MnV6          | U,N                | 430                                                                             | 430          | 430          | 590-740                               | 20         | L=59                         |         |                            |
| EN 10297-1 | 20MnV6          | Z                  |                                                                                 |              |              |                                       |            |                              |         |                            |
| EN 10297-1 | 30G2            | U,N                | ≤ 100 mm: Re min310-Rm min 600;<br>≥ 100,1 mm: Re min290-Rm min590;<br>A5min 18 |              |              |                                       |            |                              |         |                            |

|                                                               |                                                                               |                                                                            |                                                                                    |
|---------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                        | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                                       | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM                                    |  |
| MECHANICKÉ VLASTNOSTI OCELÍ VYRÁBĚNÝCH DLE ZAHRANIČNÍCH NOREM | MECHANICAL PROPERTIES OF STEEL GRADES PRODUCED ACCORDING TO FOREIGN STANDARDS | MECHANISCHE EIGENSCHAFTEN DER GEMÄSS AUSLÄNDISCHEN NORMEN ERZEUGTEN STÄHLE |                                                                                    |
|                                                               |                                                                               |                                                                            |                                                                                    |

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| Norma       | Jakost      | Tepelné zpracování | Re min. (MPa) |              |              | Rm (MPa)                | A5min. (%)  | KV (J)            | HB max. | Teplota použití            |
|-------------|-------------|--------------------|---------------|--------------|--------------|-------------------------|-------------|-------------------|---------|----------------------------|
|             |             |                    | t do 16 mm    | t 16 – 40 mm | t 40 – 65 mm |                         |             |                   |         |                            |
| Standard    | Grade       | Heat treatment     | Re min. (MPa) |              |              | Rm (MPa)                | A5min. (%)  | KV (J)            | HB max. | Temperature of application |
|             |             |                    | t up to 16 mm | t 16 – 40 mm | t 40 – 65 mm |                         |             |                   |         |                            |
| Norm        | Güte        | Wärmebehandlung    | Re min. (MPa) |              |              | Rm (MPa)                | A5min. (%)  | KV (J)            | HB max. | Verwendungs-Temperatur     |
|             |             |                    | t bis 16 mm   | t 16 – 40 mm | t 40 – 65 mm |                         |             |                   |         |                            |
| EN 10297-1  | C10E        | G                  |               |              |              |                         |             |                   | 131     |                            |
| EN 10297-1  | C15E        | G                  |               |              |              |                         |             |                   | 143     |                            |
| EN 10297-1  | C15R        | G                  |               |              |              |                         |             |                   | 143     |                            |
| EN 10297-1  | C22E        | U,N                | 240           | 210          | 210          | ≤ 16: 430<br>16-60: 410 | 25          |                   |         |                            |
| EN 10297-1  | C22E        | G                  |               |              |              |                         |             |                   | 156     |                            |
| EN 10297-1  | C35E        | U,N                | 300           | 270          | 270          | ≤ 16: 550<br>16-60: 520 | 19          |                   |         |                            |
| EN 10297-1  | C35E        | G                  |               |              |              |                         |             |                   | 183     |                            |
| EN 10297-1  | C45E        | U,N                | 340           | 305          | 305          | ≤ 16: 620<br>16-60: 580 | 16          |                   |         |                            |
| EN 10297-1  | C45E        | G                  |               |              |              |                         |             |                   | 207     |                            |
| EN 10297-1  | C60E        | N                  | 390           | 350          | 340          | ≤ 16: 710<br>16-65: 670 | 11          |                   |         |                            |
| EN 10297-1  | 41Cr4       | G                  |               |              |              |                         |             |                   | 241     |                            |
| EN 10297-1  | 25CrMo4     | Z                  | ≤ 8: 700      | 8 – 20: 600  | 20 – 50: 450 | 900; 800;<br>700;       | 12; 14; 15; | T = 32; 27*       |         |                            |
|             |             |                    |               |              | 50 – 65: 400 | 650                     | 16          | L = 45; 50*       |         |                            |
| EN 10297-1  | 25CrMo4     | G                  |               |              |              |                         |             |                   | 212     |                            |
| EN 10297-1  | 34CrMo4     | Z                  | ≤ 8: 800      | 8 – 20: 650  | 20 – 50: 550 | 1000; 900;<br>800;      | 11; 12; 14; | T = 25; 27*       |         |                            |
|             |             |                    |               |              | 50 – 65: 500 | 750                     | 15          | L = 35; 40; 45*   |         |                            |
| EN 10297-1  | 34CrMo4     | G                  |               |              |              |                         |             |                   | 223     |                            |
| EN 10297-1  | 42CrMo4     | Z                  | ≤ 8: 900      | 8 – 20: 750  | 20 – 50: 650 | 1100;<br>1000;<br>900;  | 10; 11; 12; | T = 22*           |         |                            |
|             |             |                    |               |              | 50 – 65: 550 | 800                     | 16          | L = 30; 35*       |         |                            |
| EN 10297-1  | 42CrMo4     | G                  |               |              |              |                         |             |                   | 241     |                            |
| NF A 49-311 | TU 37-b     | U,N                | 220           | 200          | –            | min. 360                | 23          |                   |         | 20                         |
| NF A 49-311 | TU 52-b     | U,N                | 345           | 325          | –            | min. 510                | 20          |                   |         | 20                         |
| NF A 49-112 | TU E 220 A  | U,N                | 220           | 200          | 200          | 360-500                 | 23          |                   |         | 20                         |
| NF A 49-211 | TU E 220 B  | U,N                | 220           | 220          | 220          | 370-490                 | 26          | KCV = 35          |         | 20                         |
| NF A 49-211 | TU E 220 B1 | U,N                | 220           | 220          | 220          | 370-490                 | 26          | KCV = 35 (0°C)    |         | 20                         |
| NF A 49-211 | TU E 220 B2 | U,N                | 220           | 220          | 220          | 370-490                 | 26          | KCV = 35 (– 20°C) |         | 20                         |
| NF A 49-211 | TU E 250 B  | U,N                | 250           | 250          | 250          | 410-530                 | 23          | KCV = 35          |         | 20                         |
| NF A 49-211 | TU E 250 B1 | U,N                | 250           | 250          | 250          | 410-530                 | 23          | KCV = 35 (0°C)    |         | 20                         |
| NF A 49-211 | TU E 250 B2 | U,N                | 250           | 250          | 250          | 410-530                 | 23          | KCV = 35 (– 20°C) |         | 20                         |
| NF A 49-211 | TU E 275 B  | U,N                | 275           | 275          | 275          | 470-590                 | 20          | KCV = 35          |         | 20                         |
| NF A 49-211 | TU E 275 B1 | U,N                | 275           | 275          | 275          | 470-590                 | 20          | KCV = 35 (0°C)    |         | 20                         |
| NF A 49-211 | TU E 275 B2 | U,N                | 275           | 275          | 275          | 470-590                 | 20          | KCV = 35 (– 20°C) |         | 20                         |

| VYSVĚTLIVKY                                                                                                                     | LEGEND                                                                                                                                     | ERLÄUTERUNGEN                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| t – tloušťka stěny                                                                                                              | t – wall thickness                                                                                                                         | t – Wanddicke                                                                                                                                       |
| D – vnější průměr                                                                                                               | D – outside diameter                                                                                                                       | D – Außendurchmesser                                                                                                                                |
| T – příčný                                                                                                                      | T – transverse                                                                                                                             | T – quer                                                                                                                                            |
| L – podélný                                                                                                                     | L – longitudinal                                                                                                                           | L – längs                                                                                                                                           |
| TEPELNÉ ZPRACOVÁNÍ                                                                                                              | HEAT TREATMENT                                                                                                                             | WÄRMEBEHANDLUNG                                                                                                                                     |
| U – bez tepelného zpracování                                                                                                    | U – without heat treatment                                                                                                                 | U – ohne Wärmebehandlung                                                                                                                            |
| N – normalizačně žiháno                                                                                                         | N – normalizing                                                                                                                            | N – Normalglühen                                                                                                                                    |
| G – žiháno na měkko                                                                                                             | G – soft annealing                                                                                                                         | G – Weichglühen                                                                                                                                     |
| Z – zušlechtěno                                                                                                                 | Z – quenching and tempering                                                                                                                | Z – Härten und Anlassen                                                                                                                             |
| A5 MIN.                                                                                                                         | A5 MIN.                                                                                                                                    | A5 MIN.                                                                                                                                             |
| vz (vzorec)                                                                                                                     | according to                                                                                                                               | gemäss                                                                                                                                              |
| POZNÁMKA                                                                                                                        | NOTICE                                                                                                                                     | VERMERK                                                                                                                                             |
| * Hodnoty závislé od stěny.                                                                                                     | * Production acc. to EN 10297-1 allocated to these grades.                                                                                 | * Zu diesen Qualitäten ist die Produktion nach EN 10297-1 angepasst.                                                                                |
| – uvedené min. hodnoty KV platí pro plný vzorek (10x10 mm)<br>– u hodnot KV bez uvedené teploty se provádějí zkoušky při + 20°C | – stated min. KV values apply to a full sample (10x10 mm)<br>– testing at + 20°C is carried out where the KV value has no temperature data | – angenannte minimum KV Werte gülten für den ganzen Muster<br>– bei KV Werten ( ohne angenannte Temperaturen ) sind die Probenbei + 20 durchgeführt |
| Vyrábíme po dohodě.                                                                                                             | Special agreement necessary.                                                                                                               | Wir fertigen im begrenzten Umfang und nur nach Vereinbarung.                                                                                        |



|                                           |                                                                |                                                                  |
|-------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------|
| OCÉLOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM    | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                        | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM                          |
| CHEMICKÉ SLOŽENÍ OCELÍ VYRÁBĚNÝCH DLE ČSN | CHEMICAL COMPOSITION OF STEEL GRADES PRODUCED ACCORDING TO ČSN | CHEMISCHE ZUSAMMENSETZUNG DER GEMÄSS ČSN – NORM ERZEUGTEN STÄHLE |
|                                           |                                                                |                                                                  |

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| CHEMICKÉ SLOŽENÍ OCELÍ VYRÁBĚNÝCH DLE ČSN |           |           |           |           |           | CHEMICAL COMPOSITION OF STEEL GRADES PRODUCED ACCORDING TO ČSN |           |           |           |           |            | CHEMISCHE ZUSAMMENSETZUNG DER GEMÄSS ČSN – NORM ERZEUGTEN STÄHLE |                                                                                               |             |                  |                                      |                  |
|-------------------------------------------|-----------|-----------|-----------|-----------|-----------|----------------------------------------------------------------|-----------|-----------|-----------|-----------|------------|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------|------------------|--------------------------------------|------------------|
| Ja-<br>kost                               | C         | Mn        | Si        | P<br>max. | S<br>max. | Cu                                                             | Ni        | Cr        | Mo        | V         | Al         | N                                                                | Nb,Ti,B<br>a W                                                                                | P+S<br>max. | Cr+Ni+Cu<br>max. | Technické<br>dodací<br>podmínky      | Použití          |
| Grade                                     | C         | Mn        | Si        | P<br>max. | S<br>max. | Cu                                                             | Ni        | Cr        | Mo        | V         | Al         | N                                                                | Nb,Ti,B<br>and W                                                                              | P+S<br>max. | Cr+Ni+Cu<br>max. | Technical<br>delivery<br>conditions  | Appli-<br>cation |
| Güte                                      | C         | Mn        | Si        | P<br>max. | S<br>max. | Cu                                                             | Ni        | Cr        | Mo        | V         | Al         | N                                                                | Nb,Ti,B<br>und W                                                                              | P+S<br>max. | Cr+Ni+Cu<br>max. | Technische<br>Lieferbe-<br>dingungen | Verwen-<br>dung  |
| 11 353                                    | max.0.18  |           |           | 0.05      | 0.05      |                                                                |           |           |           |           |            |                                                                  |                                                                                               | 0.09        |                  | ČSN 42 0250,<br>42 5720              | 9                |
| 11 368                                    | max.0.15  | min. 0.40 | max. 0.35 | 0.04      | 0.04      | max.0.30                                                       | max.0.30  | max.0.30  |           |           |            |                                                                  |                                                                                               |             | 0.7              | ČSN 42 0251                          | 2                |
| 11 369                                    | max.0.14  | max. 0.80 | max. 0.35 | 0.04      | 0.04      | max.0.30                                                       | max.0.30  | max.0.30  |           |           | min. 0.020 |                                                                  |                                                                                               |             | 0.7              | ČSN 42 0165                          | 5                |
| 11 418                                    | max.0.21  | max. 1.20 | 0.10-0.35 | 0.03      | 0.025     | max.0.25                                                       | max.0.30  | max.0.25  | max. 0.08 | max. 0.02 | min. 0.020 |                                                                  |                                                                                               |             |                  | ČSN 42 0251                          | 2                |
| 11 419                                    | max.0.20  | max. 0.80 | max. 0.35 | 0.04      | 0.04      | max.0.30                                                       | max.0.30  | max.0.30  |           |           | min. 0.020 |                                                                  | max.Nb.0.01.<br>Ti0.03                                                                        |             | 0.7              | ČSN 42 0165                          | 5                |
| 11 449                                    | max.0.15  | max. 1.50 | max. 0.40 | 0.035     | 0.035     | max.0.30                                                       | max.0.20  | max.0.30  |           |           | min. 0.020 |                                                                  | Nb 0.010-<br>0.050                                                                            | 0.06        |                  | ČSN 42 0250,<br>42 0251              | 4, 9             |
| 11 453                                    | max.0.24  |           |           | 0.05      | 0.05      |                                                                |           |           |           |           |            |                                                                  |                                                                                               | 0.09        |                  | ČSN 42 0250,<br>42 5720              | 9                |
| 11 503                                    | max.0.22  | max. 1.60 | max. 0.55 | 0.035     | 0.035     | max.0.30                                                       | max.0.30  | max.0.30  |           |           | min. 0.015 |                                                                  | Nb 0.020-<br>0.080                                                                            |             | 0.7              | ČSN 42 0165                          | 5                |
| 11 523                                    | max.0.22  | max. 1.60 | max. 0.55 | 0.035     | 0.035     |                                                                |           |           |           |           | min. 0.020 |                                                                  |                                                                                               |             |                  | ČSN 42 0250,<br>42 0251,<br>42 5720  | 4, 9             |
| 11 550                                    | max.0.40  |           |           | 0.05      | 0.05      |                                                                |           |           |           |           |            |                                                                  |                                                                                               | 0.09        |                  | ČSN 42 0250                          | 9                |
| 11 559                                    | max.0.45  |           |           | 0.04      | 0.05      |                                                                |           |           |           |           |            |                                                                  |                                                                                               |             |                  |                                      | 6                |
| 11 650                                    | max.0.55  |           |           | 0.05      | 0.05      |                                                                |           |           |           |           |            |                                                                  |                                                                                               | 0.09        |                  | ČSN 42 0250                          | 9                |
| 11 658                                    | max.0.50  |           |           | 0.04      | 0.05      |                                                                |           |           |           |           |            |                                                                  |                                                                                               |             |                  |                                      | 6                |
| 11 707                                    | max.0.49  |           |           | 0.04      | 0.05      |                                                                |           |           |           |           |            |                                                                  |                                                                                               |             |                  |                                      | 6                |
| 12 011                                    | max.0.09  | 0.20-0.45 | max.0.15  | 0.035     | 0.04      | max.0.15                                                       | max.0.15  | max.0.15  |           |           | min. 0.020 |                                                                  |                                                                                               |             |                  | ČSN 42 0250                          | 4                |
| 12 012                                    | max.0.09  | 0.20-0.45 | max.0.15  | 0.035     | 0.04      | max.0.15                                                       | max.0.15  | max.0.15  |           |           | min. 0.020 |                                                                  |                                                                                               |             |                  | ČSN 42 0250                          | 4                |
| 12 015                                    | 0.05-0.12 | 0.20-0.45 | max.0.15  | 0.025     | 0.025     | max.0.15                                                       | max.0.15  | max.0.20  |           |           | min. 0.020 |                                                                  |                                                                                               |             |                  | ČSN 42 0250                          | 4                |
| 12 016                                    | max.0.09  | 0.70-1.20 | 0.25-0.45 | 0.025     | 0.02      | max.0.25                                                       | max.0.20  | max.0.25  |           |           | min. 0.015 |                                                                  |                                                                                               |             |                  | ČSN 42 0250                          | 3                |
| 12 021                                    | 0.07-0.15 | 0.35-0.60 | 0.17-0.35 | 0.04      | 0.04      | max.0.25                                                       | max.0.25  | max.0.25  |           |           |            |                                                                  |                                                                                               |             |                  | ČSN 42 0250,<br>42 0251              | 2                |
| 12 022                                    | 0.15-0.22 | 0.50-0.80 | 0.17-0.37 | 0.04      | 0.04      | max.0.25                                                       | max.0.25  | max.0.25  |           |           |            |                                                                  |                                                                                               |             |                  | ČSN 42 0250,<br>42 0251              | 2                |
| 12 025                                    | 0.14-0.20 | 0.60-1.00 | 0.17-0.37 | 0.04      | 0.04      | max.0.25                                                       | max.0.25  | max.0.25  |           | 0.05-0.09 |            |                                                                  | když V=0,<br>tak Nb=0.02-0.06<br>when V=0,<br>so Nb=0.02-0.06<br>wenn V=0,<br>so Nb=0.02-0.06 | 0.07        |                  | ČSN 42 0250,<br>42 0251              | 2                |
| 12 040                                    | 0.32-0.40 | 0.50-0.80 | 0.15-0.40 | 0.04      | 0.04      | max.0.30                                                       | max.0.30  | max.0.25  |           |           |            |                                                                  |                                                                                               |             |                  | ČSN 42 0250                          | 4, 12            |
| 12 050                                    | 0.42-0.50 | 0.50-0.80 | 0.17-0.37 | 0.04      | 0.04      | max.0.30                                                       | max.0.30  | max.0.25  |           |           |            |                                                                  |                                                                                               |             |                  | ČSN 42 0250                          | 4, 12            |
| 12 060                                    | 0.52-0.60 | 0.50-0.80 | 0.15-0.40 | 0.04      | 0.04      | max.0.30                                                       | max.0.30  | max.0.25  |           |           |            |                                                                  |                                                                                               |             |                  | ČSN 42 0250                          | 4, 12            |
| 13 142                                    | 0.36-0.44 | 1.00-1.30 | 0.15-0.40 | 0.035     | 0.035     |                                                                |           |           |           |           |            |                                                                  |                                                                                               |             |                  | ČSN 42 0250,<br>42 0165              | 4, 5             |
| 13 220                                    | 0.15-0.20 | 1.30-1.80 | 0.25-0.50 | 0.04      | 0.04      | max.0.30                                                       | max.0.30  | max.0.30  |           | 0.10-0.20 | min. 0.010 | 0.010-<br>0.020                                                  |                                                                                               |             | 0.7              |                                      | 4, 5             |
| 13 320                                    | 0.12-0.20 | 2.00-2.40 | 0.30-0.60 | 0.035     | 0.03      |                                                                |           | max. 0.30 |           |           |            |                                                                  |                                                                                               |             |                  | ČSN 42 0250                          | 1, 4             |
| 14 140                                    | 0.35-0.42 | 0.50-0.80 | 0.17-0.37 | 0.035     | 0.035     |                                                                |           | 0.80-1.10 |           |           |            |                                                                  |                                                                                               |             |                  | ČSN 42 0250                          | 4, 12            |
| 14 220                                    | 0.14-0.19 | 1.10-1.40 | 0.17-0.37 | 0.035     | 0.035     |                                                                |           | 0.80-1.10 |           |           |            |                                                                  |                                                                                               |             |                  | ČSN 42 0250                          | 4, 13            |
| 14 331                                    | 0.28-0.35 | 0.80-1.10 | 0.90-1.20 | 0.035     | 0.035     |                                                                |           | 0.80-1.10 |           |           |            |                                                                  |                                                                                               |             |                  | ČSN 42 0250                          | 4, 12            |
| 15 020                                    | 0.12-0.20 | 0.40-0.80 | 0.15-0.37 | 0.04      | 0.04      |                                                                |           |           | 0.25-0.35 |           | 0.015      |                                                                  |                                                                                               |             |                  | ČSN 42 0251                          | 2, 3             |
| 15 110                                    | 0.08-0.16 | 0.40-0.70 | 0.15-0.40 | 0.04      | 0.04      |                                                                |           | 0.50-0.75 |           | 0.20-0.35 |            |                                                                  |                                                                                               |             |                  | ČSN 42 0251                          | 2                |
| 15 112                                    | 0.08-0.16 | 0.40-0.70 | 0.15-0.40 | 0.035     | 0.035     |                                                                |           | 0.50-0.75 | 0.08-0.14 | 0.20-0.35 |            |                                                                  |                                                                                               |             |                  | ČSN 42 0251                          | 2                |
| 15 121                                    | 0.10-0.18 | 0.40-0.70 | 0.15-0.35 | 0.04      | 0.04      |                                                                |           | 0.70-1.30 | 0.40-0.60 |           |            |                                                                  |                                                                                               |             |                  | ČSN 42 0251                          | 2, 3             |
| 15 127                                    | 0.10-0.17 | 0.90-1.20 | 0.20-0.45 | 0.04      | 0.04      | 0.30-0.55                                                      | 0.30-0.60 | 0.40-0.80 |           | 0.02-0.06 | min. 0.015 |                                                                  | Nb 0.020-<br>0.060                                                                            |             |                  | ČSN 42 0251                          | 4, 8             |
| 15 128                                    | 0.10-0.18 | 0.45-0.70 | 0.15-0.40 | 0.04      | 0.04      |                                                                |           | 0.50-0.75 | 0.40-0.60 | 0.22-0.35 | max. 0.025 |                                                                  |                                                                                               |             |                  | ČSN 42 0251                          | 2                |
| 15 130                                    | 0.22-0.29 | 0.50-0.80 | 0.17-0.37 | 0.035     | 0.035     |                                                                |           | 0.90-1.20 | 0.15-0.25 |           |            |                                                                  |                                                                                               |             |                  | ČSN 42 0250                          | 4                |



CHEMICKÉ SLOŽENÍ OCELÍ VYRÁBĚNÝCH  
DLE ČSN

CHEMICAL COMPOSITION OF STEEL GRADES  
PRODUCED ACCORDING TO ČSN

CHEMISCHE ZUSAMMENSETZUNG DER GEMÄSS  
ČSN – NORM ERZEUGTEN STÄHLE

## 2/2

| Ja-<br>kost | C         | Mn        | Si        | P<br>max. | S<br>max. | Cu       | Ni        | Cr        | Mo        | V         | Al        | N | Nb,Ti,B<br>a W     | P+S<br>max. | Cr+Ni+Cu<br>max. | Technické<br>dodací<br>podmínky      | Použití          |
|-------------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|---|--------------------|-------------|------------------|--------------------------------------|------------------|
| Grade       | C         | Mn        | Si        | P<br>max. | S<br>max. | Cu       | Ni        | Cr        | Mo        | V         | Al        | N | Nb,Ti,B<br>and W   | P+S<br>max. | Cr+Ni+Cu<br>max. | Technical<br>delivery<br>conditions  | Appli-<br>cation |
| Güte        | C         | Mn        | Si        | P<br>max. | S<br>max. | Cu       | Ni        | Cr        | Mo        | V         | Al        | N | Nb,Ti,B<br>und W   | P+S<br>max. | Cr+Ni+Cu<br>max. | Technische<br>Lieferbe-<br>dingungen | Verwen-<br>dung  |
| 15 221      | 0.12-0.20 | 0.80-1.20 | 0.17-0.37 | 0.04      | 0.04      |          |           | 0.80-1.20 |           | 0.10-0.20 |           |   |                    |             |                  | ČSN 42 0250,<br>42 0251              | 2                |
| 15 223      | 0.17-0.23 | 1.20-1.60 | 0.15-0.40 | 0.04      | 0.04      | max.0.30 | max.0.25  | max.0.20  | 0.30-0.50 |           |           |   |                    |             |                  | ČSN 42 0250                          | 4                |
| 15 313      | 0.08-0.15 | 0.40-0.80 | 0.15-0.40 | 0.035     | 0.035     |          |           | 2.00-2.50 | 0.90-1.10 | 0.10-0.20 |           |   |                    |             |                  | ČSN 42 0251                          | 2,3,11           |
| 15 323      | 0.15-0.20 | 0.30-0.50 | 0.20-0.35 | 0.035     | 0.03      |          |           | 2.70-3.20 | 0.20-0.30 | 0.10-0.20 |           |   |                    |             |                  | ČSN 42 0250,<br>42 0251              | 2,3              |
| 16 140      | 0.35-0.43 | 0.50-0.80 | 0.15-0.40 | 0.035     | 0.035     |          | 0.40-0.70 | 0.40-0.70 | 0.20-0.50 |           |           |   |                    |             |                  | ČSN 42 0165                          | 4,5,14           |
| 16 222      | max.0.18  | 1.00-1.50 | max.0.35  | 0.04      | 0.04      | max.0.30 | 0.70-1.10 | max.0.30  |           |           | min.0.010 |   | Nb 0.040-<br>0.080 |             |                  | ČSN 42 0165                          | 4,5              |
| 16 224      | 0.12-0.18 | 0.70-1.00 | 0.15-0.35 | 0.03      | 0.03      | max.0.30 | 0.70-1.00 | 0.70-1.00 | 0.30-0.50 | 0.03-0.08 |           |   | Ti max.0.04        |             |                  | ČSN 42 0165,<br>42 0250              | 1,4              |
| 17 102      | max.0.15  | max.0.60  | max.0.50  | 0.035     | 0.03      |          |           | 4.00-6.00 | 0.45-0.65 |           |           |   |                    |             |                  | ČSN 42 0252                          | 2,3              |

| VYSVĚTLIVKY                             | LEGEND                                            | ERLÄUTERUNGEN                                                |
|-----------------------------------------|---------------------------------------------------|--------------------------------------------------------------|
| POUŽITÍ                                 | APPLICATION                                       | VERWENDUNG                                                   |
| 1 odolnost proti otěru                  | 1 abrasion resistance                             | 1 Abriebbeständigkeit                                        |
| 2 pro energetiku, vyšší tlaky a teploty | 2 tubes for high pressure and temperature service | 2 für Energetik                                              |
| 3 pro chemické zařízení                 | 3 chemical equipment                              | 3 für chemische Einrichtungen                                |
| 4 konstrukční pro strojní zařízení      | 4 structural steel for engineering equipment      | 4 Konstruktionsstahl für Maschinenbau                        |
| 5 pro nízké teploty                     | 5 low temperature service                         | 5 für niedrige Temperaturen                                  |
| 6 pro těžbu ropy a V geologii           | 6 oil and gas prospecting                         | 6 für Erdölgewinnung und Geologie                            |
| 7 odolnost proti korozi                 | 7 resistant to corrosion                          | 7 Korrosionsbeständigkeit                                    |
| 8 odolnost proti atmosférické korozi    | 8 resistant to atmospheric corrosion              | 8 Beständigkeit gegen atmosphärische Korrosion               |
| 9 všeobecné použití v trubkách          | 9 general use for tubes                           | 9 allgemeine Verwendung in Rohren                            |
| 10 pro dálková potrubí                  | 10 long distance pipelines                        | 10 für Fernrohrleitungen                                     |
| 11 odolnost proti stlačenému vodíku     | 11 resistant to compressed hydrogen               | 11 Beständigkeit gegen Drucknatrium                          |
| 12 pro zušlechťování                    | 12 steel for quenching and tempering              | 12 zum Veredeln                                              |
| 13 pro cementování                      | 13 case hardening steel                           | 13 zum Zementieren                                           |
| 14 pro láhve a stlačené plyny           | 14 pipe for gas cylinders                         | 14 für Flaschen und Druckgase                                |
| Na požádání.                            | On request.                                       | Nach Vereinbarung.                                           |
| Vyrábíme po dohodě.                     | Special agreement necessary.                      | Wir fertigen im begrenzten Umfang und nur nach Vereinbarung. |



1/2

| MECHANICKÉ VLASTNOSTI OCELÍ<br>VYRÁBĚNÝCH DLE ČSN |                       |               |              |              | MECHANICAL PROPERTIES OF STEEL<br>GRADES PRODUCED ACCORDING TO<br>ČSN |               |                 |            | MECHANISCHE EIGENSCHAFTEN DER<br>GEMÄSS ČSN-NORM ERZEUGTEN<br>STÄHLE |                |             |
|---------------------------------------------------|-----------------------|---------------|--------------|--------------|-----------------------------------------------------------------------|---------------|-----------------|------------|----------------------------------------------------------------------|----------------|-------------|
| Jakost                                            | Tepelné<br>zpracování | Re min. (MPa) |              |              | Rm<br>(MPa)                                                           | A5min.<br>(%) | KCU3<br>(J/cm²) | HB<br>max. | Teplota<br>použití                                                   | Svařitelnost   | Použití     |
| Grade                                             | Heat<br>treatment     | Re,min. (MPa) |              |              | Rm<br>(MPa)                                                           | A5min.<br>(%) | KCU3<br>(J/cm²) | HB<br>max. | Temperature of<br>application                                        | Weldability    | Application |
| Güte                                              | Wärmebe-<br>handlung  | Re,min. (MPa) |              |              | Rm<br>(MPa)                                                           | A5min.<br>(%) | KCU3<br>(J/cm²) | HB<br>max. | Verwendungs-<br>Temperatur                                           | Schweißbarkeit | Verwendung  |
|                                                   |                       | t do 12 mm    | t 12 – 25 mm | t 25 – 36 mm |                                                                       |               |                 |            |                                                                      |                |             |
| 11 353                                            | 0                     | 245           | 235          | 226          | min. 345                                                              | 24            |                 |            |                                                                      | 1              | 9           |
| 11 353                                            | 1                     | 235           | 226          | 216          | 340-470                                                               | 25            |                 | 135        |                                                                      | 1              | 9           |
| 11 368                                            | 1                     | 245           | 245          | 235          | 350-440                                                               | 26            | 118             |            | 350                                                                  | 1              | 2           |
| 11 369                                            | 1                     | 226           | 226          | 226          | 353-481                                                               | 10800/Rm      | 29 (– 50°C)     |            | – 50                                                                 | 1              | 5           |
| 11 418                                            | 1                     | 255           | 245**        | 245          | 410-530                                                               | 24            | 88              |            | 450                                                                  | 1              | 2           |
| 11 419                                            | 1                     | 255           | 255          | 255          | 400-530                                                               | 10800/Rm      | 39 (– 40°C)     |            | – 40                                                                 | 1              | 5           |
| 11 449                                            | 1                     | 295           | 295**        |              | 430-530                                                               | 22            | KV=40 (0°C)     |            |                                                                      | 1              | 4, 9        |
| 11 453                                            | 0                     | 275           | 265          | 255          | min. 441                                                              | 20            |                 |            |                                                                      | 1              | 9           |
| 11 453                                            | 1                     | 265           | 265          | 255          | 441-568                                                               | 21            |                 | 163        |                                                                      | 1              | 9           |
| 11 503                                            | 1                     | 355*          | 345**        | 345          | 490-630                                                               | 22            | KV=48 (0°C)     |            | 400, – 50                                                            | 1              | 5           |
| 11 523                                            | 1                     | 355*          | 345**        | 345          | 490-630                                                               | 22            | KV=27 (0°C)     |            |                                                                      | 1              | 4, 9        |
| 11 523                                            | 1                     | 355*          |              |              | 510-680                                                               | 22            | KV=27 (0°C)     |            |                                                                      | 1              | 4, 9        |
| 11 550                                            | 0                     | 335           | 315          | 295          | 540-715                                                               | 15            |                 | 205        |                                                                      | 4              | 9           |
| 11 550                                            | 1                     | 315           | 305          | 295          | 540-670                                                               | 17            |                 | 191        |                                                                      | 4              | 9           |
| 11 559                                            | 1                     | 375-550       | 375-550      | 375-550      | min. 540                                                              | 18            |                 |            |                                                                      | 3              | 6           |
| 11 650                                            | 0                     | 375           | 365          | 355          | 640-815                                                               | 11            |                 | 234        |                                                                      | 4              | 9           |
| 11 650                                            | 1                     | 365           | 355          | 345          | 640-765                                                               | 12            |                 | 219        |                                                                      | 4              | 9           |
| 11 658                                            | 1                     | 375           | 375          | 375          | min. 640                                                              | 16            |                 |            |                                                                      | 3              | 6           |
| 11 707                                            | 1                     | 510           | 510          | 510          | min. 686                                                              | 14(12)        |                 |            |                                                                      | 3              | 6           |
| 11 707                                            | 6                     | 552-758       | 552-758      | 552-758      | min. 689                                                              | 14(12)        |                 |            |                                                                      | 3              | 6           |
| 12 011                                            | 1                     | 205           | 195          | 185          | 310-420                                                               | 30            |                 | 135        |                                                                      | 1              | 4           |
| 12 012                                            | 1                     | 205           | 195          | 185          | 310-420                                                               | 30            |                 | 135        |                                                                      | 1              | 4           |
| 12 015                                            | 1                     | 200           |              |              | 310-410                                                               | 30            |                 |            |                                                                      | 1              | 4           |
| 12 016                                            | 2                     | 200           | 200          | 200          | 360-500                                                               | 22            |                 |            |                                                                      | 1              | 3           |
| 12 021                                            | 1                     | 235           | 225          | 215          | 340-470                                                               | 25            | 69              | 147        | 450                                                                  | 1              | 2           |
| 12 022                                            | 1                     | 255           | 255          | 245          | 440-570                                                               | 21            | 59              | 175        | 450                                                                  | 1              | 2           |
| 12 025                                            | 1                     | 320           | 320          | 320          | 440-600                                                               | 23            | 80              | 180        | 480                                                                  | 1              | 2           |
| 12 040                                            | 1                     | 295           | 295          | 285          | min. 530                                                              | 18            |                 | 206        |                                                                      | 4              | 4, 12       |
| 12 050                                            | 1                     | 325           | 325          | 315          | min. 590                                                              | 17            |                 | 225        |                                                                      | 4              | 4, 12       |
| 12 060                                            | 1                     | 375           | 355          | 345          | min. 660                                                              | 13            |                 | min. 245   |                                                                      | 4              | 4, 12       |
| 13 142                                            | 1                     | 412           | 412          |              | 637-785                                                               | 16            | 59              | 185-225    |                                                                      | 4              | 4, 5        |
| 13 142                                            | 6                     | 490           | 490          | 490          | 686-834                                                               | 16            | 59              | 200-275    |                                                                      | 4              | 4, 5        |
| 13 220                                            | 1                     | 430           | 430          | 430          | 590-740                                                               | 20            | 59 (0°C)        |            |                                                                      | 2              | 4, 5        |
| 13 320                                            | 2                     | 360           | 360          | 360          | min. 540                                                              | 18            |                 | 152-230    |                                                                      | 2              | 1, 4        |
| 14 140                                            | 2                     |               |              |              |                                                                       |               |                 | 240        |                                                                      | 4              | 4, 12       |
| 14 140                                            | 3                     |               |              |              |                                                                       |               |                 | 217        |                                                                      | 4              | 4, 12       |
| 14 140                                            | 7                     | 785           | 785          | 785          | 932-1128                                                              | 12            | KCU2=59         | 285-345    |                                                                      | 4              | 4, 12       |
| 14 220                                            | 3                     |               |              |              |                                                                       |               |                 | 197        |                                                                      |                | 4, 13       |
| 14 331                                            | 3                     |               |              |              |                                                                       |               |                 | 229        |                                                                      | 2              | 4, 12       |
| 14 331                                            | 7                     | 880           | 880          | 880          | 1080-1270                                                             | 12            |                 | 331-385    |                                                                      | 2              | 4, 12       |
| 15 020                                            | 1                     | 285           | 270          | 270          | 450-600                                                               | 22            | 78/59           |            | 530                                                                  | 1              | 2, 3        |
| 15 110                                            | 5                     | 255           | 255          | 235          | 440-590                                                               | 20            | 78              | 127-169    | 525                                                                  | 2              | 2           |
| 15 112                                            | 5                     | 290           | 290          | 270          | 440-590                                                               | 20            | 75              | 125-170    | 550                                                                  | 2              | 2           |
| 15 121                                            | 5                     | 295           | 295          | 295          | 440-590                                                               | 22            | 78/59           |            | 560                                                                  | 3              | 2, 3        |
| 15 127                                            | 1                     | 345           | 345          | 325          | 550-750                                                               | 22            | 70 (0°C)        |            |                                                                      | 2              | 4, 8        |
| 15 128                                            | 5                     | 365           | 355 **       | 355          | 490-700                                                               | 18            | 50              | 140-197    | 580                                                                  | 2              | 2           |
| 15 128                                            | 9                     |               | 430          | 430          | 570-740                                                               | 17            | 60              | 163-223    | 580                                                                  | 2              | 2           |
| 15 130                                            | 3                     |               |              |              |                                                                       |               |                 | 200        |                                                                      | 2              | 2           |
| 15 130                                            | 6                     | 490           | 490          | 490          | 690-830                                                               | 15            | 98              | 208-253    |                                                                      | 2              | 4           |
| 15 221                                            | 1                     | 392           | 392          | 392          | 588-785                                                               | 17            | 78              |            | 400                                                                  | 2              | 4           |
| 15 221                                            | 5                     | 392           | 392          | 392          | 588-785                                                               | 17            | 78              |            | 400                                                                  | 2              | 2           |
| 15 221                                            | 9                     | 392           | 392          | 392          | 588-785                                                               | 17            | 78              |            | 400                                                                  | 2              | 2           |
| 15 223                                            | 5                     | 392           | 392          | 392          | 569-735                                                               | 16            | 59              | 163-211    | 400                                                                  | 2              | 4           |
| 15 223                                            | 9                     |               |              | 373          | 539-735                                                               | 16            | 39              | 155-211    | 400                                                                  | 2              | 4           |
| 15 313                                            | 5                     | 265           | 265          | 265          | 480-630                                                               | 20            | 69/54           |            | 500                                                                  | 2              | 2, 3, 11    |



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| Jakost | Teplotné<br>zpracování | Re min. (MPa) |              |              | Rm<br>(MPa) | A5min.<br>(%) | KCU3<br>(J/cm <sup>2</sup> ) | HB<br>max. | Teplota<br>použití            | Svařitel-<br>nost   | Použití     |
|--------|------------------------|---------------|--------------|--------------|-------------|---------------|------------------------------|------------|-------------------------------|---------------------|-------------|
|        |                        | t do 12 mm    | t 12 – 25 mm | t 25 – 36 mm |             |               |                              |            |                               |                     |             |
| Grade  | Heat<br>treatment      | Re,min. (MPa) |              |              | Rm<br>(MPa) | A5min.<br>(%) | KCU3<br>(J/cm <sup>2</sup> ) | HB<br>max. | Temperature of<br>application | Weldability         | Application |
|        |                        | t up to 12 mm | t 12 – 25 mm | t 25 – 36 mm |             |               |                              |            |                               |                     |             |
| Güte   | Wärmebe-<br>handlung   | Re,min. (MPa) |              |              | Rm<br>(MPa) | A5min.<br>(%) | KCU3<br>(J/cm <sup>2</sup> ) | HB<br>max. | Verwendungs-<br>Temperatur    | Schweißb-<br>arkeit | Verwendung  |
|        |                        | t bis 12 mm   | t 12 – 25 mm | t 25 – 36 mm |             |               |                              |            |                               |                     |             |
| 15 323 | 9                      | 440           | 440          | 440          | 680-780     | 17            | 50                           |            | 500                           | 2                   | 2, 3        |
| 16 140 | 6                      | 735           | 735          | 735          | 880-1030    | 14            | 80; 60(– 40°C)               | 269-317    | – 40                          | 2                   | 4, 5, 14    |
| 16 140 | 7                      | 850           | 850          | 850          | 940-1090    | 14            | 80; 60(– 40°C)               | 288-333    | – 40                          | 2                   | 4, 5, 14    |
| 16 222 | 1                      | 335           | 335          | 335          | 510-640     | 23            | 90(0°C);50<br>(– 70°C)       |            | – 70                          | 1                   | 4, 5        |
| 16 222 | 5                      | 335           | 335          | 335          | 510-640     | 23            | 90(0°C);50<br>(– 70°C)       |            | – 70                          | 1                   | 4, 5        |
| 16 224 | 6                      | 685           | 685          | 685          | 790-950     | 14            | 40(– 50°C)                   | 240-290    | – 50                          | 2                   | 1, 4        |
| 17 102 | 2                      | 210           | 210          |              | 420-590     | 22            | 69                           |            | 600                           | 2                   | 2, 3        |
| 17 102 | 5                      | 390           | 390          |              | 590-730     | 17            | 69                           |            | 600                           | 2                   | 2, 3        |

| VYSVĚTLIVKY                                                                                                           |                                       | LEGEND                                                                                                                   |                                                 | ERLÄUTERUNGEN                                                                                                                                  |                                                 |
|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| t                                                                                                                     | tloušťka stěny                        | t                                                                                                                        | wall thickness                                  | t                                                                                                                                              | Wanddicke                                       |
| TEPELNÉ ZPRACOVÁNÉ                                                                                                    |                                       | HEAT TRETMENT                                                                                                            |                                                 | WÄRMEBEHANDLUNG                                                                                                                                |                                                 |
| 0                                                                                                                     | tepelně nezpracováno                  | 0                                                                                                                        | non heat treated                                | 0                                                                                                                                              | ohne Wärmebehandlung                            |
| 1                                                                                                                     | normalizačně žiháno                   | 1                                                                                                                        | normalizing                                     | 1                                                                                                                                              | Normalglühen                                    |
| 2                                                                                                                     | žiháno                                | 2                                                                                                                        | annealed (type shown)                           | 2                                                                                                                                              | geglüht (mit Angabe der Glühungsart)            |
| 3                                                                                                                     | žiháno na měkko                       | 3                                                                                                                        | soft annealing                                  | 3                                                                                                                                              | Weichglühen                                     |
| 4                                                                                                                     | kaleno                                | 4                                                                                                                        | hardening, low annealing                        | 4                                                                                                                                              | gehärtet und angelassen auf niedrige Temperatur |
| 5                                                                                                                     | normalizačně žiháno + popouštění      | 5                                                                                                                        | normalizing and tepmpering                      | 5                                                                                                                                              | normalisiert und angelassen                     |
| 6                                                                                                                     | zušlechtěno na nižší mez pevnosti     | 6                                                                                                                        | heat treatment to lower strength                | 6                                                                                                                                              | veredelt auf untere Festigkeit                  |
| 7                                                                                                                     | zušlechtěno na střední mez pevnosti   | 7                                                                                                                        | heat treatment to medium strength               | 7                                                                                                                                              | veredelt auf mittlere Festigkeit                |
| 8                                                                                                                     | zušlechtěno na vyšší mez pevnosti     | 8                                                                                                                        | heat treatment to upper strength                | 8                                                                                                                                              | veredelt auf obere Festigkeit                   |
| 9                                                                                                                     | jiný druh žihání                      | 9                                                                                                                        | special condition of heat treatment             | 9                                                                                                                                              | Sonderwärmebehandlung                           |
| SVAŘITELNOST                                                                                                          |                                       | WELDABILITY                                                                                                              |                                                 | SCHWEISSBARKEIT                                                                                                                                |                                                 |
| 1                                                                                                                     | zaručená                              | 1                                                                                                                        | assured                                         | 1                                                                                                                                              | garantiert                                      |
| 2                                                                                                                     | zaručená podmíněčně                   | 2                                                                                                                        | assured conditionally                           | 2                                                                                                                                              | bedingt garantiert                              |
| 3                                                                                                                     | dobrá                                 | 3                                                                                                                        | favourable                                      | 3                                                                                                                                              | gut                                             |
| 4                                                                                                                     | obtížná                               | 4                                                                                                                        | difficult                                       | 4                                                                                                                                              | schwierig                                       |
| POUŽITÍ                                                                                                               |                                       | APPLICATION                                                                                                              |                                                 | VERWENDUNG                                                                                                                                     |                                                 |
| 1                                                                                                                     | odolnost proti otěru                  | 1                                                                                                                        | abrasion resistance                             | 1                                                                                                                                              | Abriebbeständigkeit                             |
| 2                                                                                                                     | pro energetiku, vyšší tlaky a teploty | 2                                                                                                                        | tubes for high pressure and temperature service | 2                                                                                                                                              | für Energetik                                   |
| 3                                                                                                                     | pro chemické zařízení                 | 3                                                                                                                        | chemical equipment                              | 3                                                                                                                                              | für chemische Einrichtungen                     |
| 4                                                                                                                     | konstrukční pro strojní zařízení      | 4                                                                                                                        | structural steel for engineering equipment      | 4                                                                                                                                              | Konstruktionsstahl für Maschineneinrichtungen   |
| 5                                                                                                                     | pro nízké teploty                     | 5                                                                                                                        | low temperature service                         | 5                                                                                                                                              | für niedrige Temperaturen                       |
| 6                                                                                                                     | pro těžbu ropy a geologie             | 6                                                                                                                        | oil and gas prospecting                         | 6                                                                                                                                              | für Erdölgewinnung und Geologie                 |
| 7                                                                                                                     | odolnost proti korozi                 | 7                                                                                                                        | resistant to corrosion                          | 7                                                                                                                                              | Korrosionsbeständigkeit                         |
| 8                                                                                                                     | odolnost proti atmosférické korozi    | 8                                                                                                                        | resistant to atmospheric corrosion              | 8                                                                                                                                              | Beständigkeit gegen atmosphärische Korrosion    |
| 9                                                                                                                     | všeobecné použití v trubkách          | 9                                                                                                                        | general use for tubes                           | 9                                                                                                                                              | allgemeine Verwendung in Rohren                 |
| 10                                                                                                                    | pro dálková potrubí                   | 10                                                                                                                       | long distance pipelines                         | 10                                                                                                                                             | für Fernrohrleitungen                           |
| 11                                                                                                                    | odolnost proti stlačenému vodíku      | 11                                                                                                                       | resistant to compressed hydrogen                | 11                                                                                                                                             | Beständigkeit gegen Drucknatrium                |
| 12                                                                                                                    | pro zušlechtování                     | 12                                                                                                                       | steel for quenching and tempering               | 12                                                                                                                                             | zum Veredeln                                    |
| 13                                                                                                                    | pro cementování                       | 13                                                                                                                       | case hardening steel                            | 13                                                                                                                                             | zum Zementieren                                 |
| 14                                                                                                                    | pro láhve a stlačené plyny            | 14                                                                                                                       | pipe for gas cylinders                          | 14                                                                                                                                             | für Flaschen und Druckgase                      |
| POZNÁMKA                                                                                                              |                                       | NOTICE                                                                                                                   |                                                 | VERMERK                                                                                                                                        |                                                 |
| *                                                                                                                     | do 16 mm                              | *                                                                                                                        | up to 16 mm                                     | *                                                                                                                                              | bis 16 mm                                       |
| **                                                                                                                    | od 16 mm                              | **                                                                                                                       | from 16 mm                                      | **                                                                                                                                             | ab 16 mm                                        |
| Všechny hodnoty platí pro zkoušení při teplotě 20°C – jiná teplota zkoušení je uvedena v závorce u příslušné hodnoty. |                                       | All values are valid for testing at temperature 20°C – other temperature is in brackets next to the corresponding value. |                                                 | Alle Werte gelten für das Prüfen bei der Temperatur von 20°C – eine andere Prüftemperatur ist beim entsprechenden Wert in Klammern aufgeführt. |                                                 |
| Vyrábíme po dohodě.                                                                                                   |                                       | Special agreement necessary.                                                                                             |                                                 | Wir fertigen im begrenzten Umfang und nur nach Vereinbarung.                                                                                   |                                                 |



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|--------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                 | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                      | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM                     |
| TRUBKY OCELOVÉ BEZEŠVÉ DODÁVANÉ DLE ZAHRANIČNÍCH NOREM | SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO FOREIGN STANDARDS | NAHTLOSE STAHLROHRE DELIEFERT GEMÄSS INTERNATIONALEN NORMEN |
| Dovolené mezní úchytky rozměrů                         | Permissible Variations on Dimensions                         | Zulässige Grenzabweichungen der Abmessungen                 |

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| TRUBKY OCELOVÉ BEZEŠVÉ DODÁVANÉ<br>DLE ZAHRANIČNÍCH NOREM                                               | SEAMLESS STEEL TUBES SUPPLIED<br>ACCORDING TO FOREIGN STANDARDS                                                                 | NAHTLOSE STAHLROHRE DELIEFERT<br>GEMÄSS INTERNATIONALEN NORMEN                                                  |
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| DOVOLENÉ MEZNÍ ÚCHYLKY ROZMĚŘŮ<br>(výťah některých hlavních parametrů, nezahrnuje<br>úplné znění normy) | PERMISSIBLE VARIATIONS ON DIMENSIONS<br>(extract of some main parameters; it does not<br>include exact wording of the standard) | ZULÄSSIGE GRENZABWEICHUNGEN DER<br>ABMESSUNGEN<br>(Auszug von einigen Hauptparametern; kein<br>Ersatz für Norm) |
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TRUBKY OCELOVÉ BEZEŠVÉ DODÁVANÉ DLE ZAHRANIČNÍCH NOREM

SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO FOREIGN STANDARDS

NAHTLOSE STAHLROHRE GELIEFERT GEMÄSS INTERNATIONALEN NORMEN

Dovolené mezní úchytky rozměrů

Permissible Variations on Dimensions

Zulässige Grenzabweichungen der Abmessungen

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| ASTM A 530                 |                                   |        |
|----------------------------|-----------------------------------|--------|
| Vnější průměr (mm)         | Dovolené úchytky vnějšího průměru |        |
|                            | horní                             | spodní |
|                            | mm                                | mm     |
| od 48.3 do 114.3 (včetně)  | + 0.8                             | - 0.8  |
| od 114.3 do 219.1 (včetně) | + 1.6                             | - 0.8  |
| od 219.1 do 457 (včetně)   | + 2.4                             | - 0.8  |

|                              |                  |
|------------------------------|------------------|
| Mezní úchytky tloušťky stěny | - 12.5 %         |
| Mezní úchytky hmotnosti      |                  |
| do ø 323.8 mm (včetně)       | + 10 % / - 3.5 % |
| nad ø 323.8 mm               | + 10 % / - 5 %   |

| DIN 1629, 1630                 |                                         |              |
|--------------------------------|-----------------------------------------|--------------|
| Mezní úchytky vnějšího průměru |                                         |              |
| Vnější průměr (mm)             | Mezní úchytky                           | Konec trubky |
| ≤ 100                          | ± 1 % D (avšak ± 0.5 mm jsou přípustné) | ± 0.4 mm     |
| 100 < D ≤ 200                  | ± 1 % D                                 | ± 0.5 % D    |
| > 200                          | ± 1 % D                                 | ± 0.6 % D    |

| Mezní úchytky tloušťky stěny                     |                                    |                     |
|--------------------------------------------------|------------------------------------|---------------------|
| D ≤ 130 mm                                       | $t \leq 2 \cdot t_n$               | + 15 % / - 10 %     |
|                                                  | $2 \cdot t_n < t \leq 4 \cdot t_n$ | + 12.5 % / - 10 %   |
|                                                  | $t > 4 \cdot t_n$                  | ± 9 %               |
| 130 < D ≤ 320 mm                                 | $t \leq 0.05 D$                    | + 17.5 % / - 12.5 % |
|                                                  | $0.05 D < t \leq 0.11 D$           | ± 12.5 %            |
|                                                  | $t > 0.11 D$                       | ± 10 %              |
| 320 < D ≤ 660 mm                                 | $t \leq 0.05 D$                    | + 20 % / - 15 %     |
|                                                  | $0.05 D < t \leq 0.09 D$           | + 15 % / - 12.5 %   |
|                                                  | $t > 0.09 D$                       | + 12.5 % / - 10 %   |
| * $t_n$ – základní tloušťka stěny podle DIN 2448 |                                    |                     |

| Mezní úchytky hmotnosti    |                |
|----------------------------|----------------|
| pro jednotlivé trubky      | + 12 % / - 8 % |
| pro dodávku alespoň 10 tun | + 10 % / - 5 % |

| DIN 17 121                       |                                     |
|----------------------------------|-------------------------------------|
| Mezní úchytky vnějšího průměru   | ± 1 % (avšak ± 0.5 mm je přípustné) |
| Mezní úchytky tloušťky stěny     | stejně jako v DIN 1629              |
| Mezní úchytky hmotnosti          |                                     |
| pro jednotlivé trubky            | + 12 % / - 8 %                      |
| pro jednu dodávku nejméně 10 tun | + 10 % / - 5 %                      |

Vysvětlivky: D = vnější průměr, t = tloušťka stěny

| ASTM A 530                      |                                            |       |
|---------------------------------|--------------------------------------------|-------|
| Outside diameter (mm)           | Permissible Variations of Outside diameter |       |
|                                 | upper                                      | lower |
|                                 | mm                                         | mm    |
| from 48.3 to 114.3 (including)  | + 0.8                                      | - 0.8 |
| from 114.3 to 219.1 (including) | + 1.6                                      | - 0.8 |
| from 219.1 to 457 (including)   | + 2.4                                      | - 0.8 |

|                                          |                  |
|------------------------------------------|------------------|
| Permissible Variations of Wall thickness | - 12.5 %         |
| Permissible Variations of Weight         |                  |
| up to ø 323.8 mm (including)             | + 10 % / - 3.5 % |
| over ø 323.8 mm                          | + 10 % / - 5 %   |

| DIN 1629, 1630                             |                                   |           |
|--------------------------------------------|-----------------------------------|-----------|
| Permissible Variations of Outside diameter |                                   |           |
| Outside diameter (mm)                      | Permissible Variations            | Tube end  |
| ≤ 100                                      | ± 1 % D (but ± 0.5 mm is allowed) | ± 0.4 mm  |
| 100 < D ≤ 200                              | ± 1 % D                           | ± 0.5 % D |
| > 200                                      | ± 1 % D                           | ± 0.6 % D |

| Permissible Variations of Wall thickness             |                                    |                     |
|------------------------------------------------------|------------------------------------|---------------------|
| D ≤ 130 mm                                           | $t \leq 2 \cdot t_n$               | + 15 % / - 10 %     |
|                                                      | $2 \cdot t_n < t \leq 4 \cdot t_n$ | + 12.5 % / - 10 %   |
|                                                      | $t > 4 \cdot t_n$                  | ± 9 %               |
| 130 < D ≤ 320 mm                                     | $t \leq 0.05 D$                    | + 17.5 % / - 12.5 % |
|                                                      | $0.05 D < t \leq 0.11 D$           | ± 12.5 %            |
|                                                      | $t > 0.11 D$                       | ± 10 %              |
| 320 < D ≤ 660 mm                                     | $t \leq 0.05 D$                    | + 20 % / - 15 %     |
|                                                      | $0.05 D < t \leq 0.09 D$           | + 15 % / - 12.5 %   |
|                                                      | $t > 0.09 D$                       | + 12.5 % / - 10 %   |
| * $t_n$ – basic wall thickness according to DIN 2448 |                                    |                     |

| Permissible Variations of Weight |                |
|----------------------------------|----------------|
| for individual tubes             | + 12 % / - 8 % |
| for delivery of at least 10 tons | + 10 % / - 5 % |

| DIN 17 121                                 |                                   |
|--------------------------------------------|-----------------------------------|
| Permissible Variations of Outside diameter | ± 1 % (but ± 0.5 mm is allowed)   |
| Permissible Variations of Wall thickness   | the same as according to DIN 1629 |
| Permissible Variations of Weight           |                                   |
| for individual tubes                       | + 12 % / - 8 %                    |
| for delivery of at least 10 tons           | + 10 % / - 5 %                    |

Legend: D = outside diameter, t = wall thickness

| ASTM A 530                           |                                             |        |
|--------------------------------------|---------------------------------------------|--------|
| Außendurchmesser (mm)                | Grenzabweichungen des Rohraußendurchmessers |        |
|                                      | obere                                       | untere |
|                                      | mm                                          | mm     |
| von 48.3 bis 114.3 (einschließlich)  | + 0.8                                       | - 0.8  |
| von 114.3 bis 219.1 (einschließlich) | + 1.6                                       | - 0.8  |
| von 219.1 bis 457 (einschließlich)   | + 2.4                                       | - 0.8  |

|                                     |                  |
|-------------------------------------|------------------|
| Grenzabweichungen der Rohrwanddicke | - 12.5 %         |
| Grenzabweichung des Rohrgewichtes   |                  |
| bis ø 323.8 mm (einschließlich)     | + 10 % / - 3.5 % |
| über ø 323.8 mm                     | + 10 % / - 5 %   |

| DIN 1629, 1630                              |                                 |           |
|---------------------------------------------|---------------------------------|-----------|
| Grenzabweichungen des Rohraußendurchmessers |                                 |           |
| Außendurchmesser (mm)                       | Grenzabweichung                 | Rohrende  |
| ≤ 100                                       | ± 1 % D (aber ± 0.5 mm maximal) | ± 0.4 mm  |
| 100 < D ≤ 200                               | ± 1 % D                         | ± 0.5 % D |
| > 200                                       | ± 1 % D                         | ± 0.6 % D |

| Grenzabweichungen der Rohrwanddicke    |                                    |                     |
|----------------------------------------|------------------------------------|---------------------|
| D ≤ 130 mm                             | $t \leq 2 \cdot t_n$               | + 15 % / - 10 %     |
|                                        | $2 \cdot t_n < t \leq 4 \cdot t_n$ | + 12.5 % / - 10 %   |
|                                        | $t > 4 \cdot t_n$                  | ± 9 %               |
| 130 < D ≤ 320 mm                       | $t \leq 0.05 D$                    | + 17.5 % / - 12.5 % |
|                                        | $0.05 D < t \leq 0.11 D$           | ± 12.5 %            |
|                                        | $t > 0.11 D$                       | ± 10 %              |
| 320 < D ≤ 660 mm                       | $t \leq 0.05 D$                    | + 20 % / - 15 %     |
|                                        | $0.05 D < t \leq 0.09 D$           | + 15 % / - 12.5 %   |
|                                        | $t > 0.09 D$                       | + 12.5 % / - 10 %   |
| * $t_n$ – Basiswanddicke nach DIN 2448 |                                    |                     |

| Grenzabweichung des Rohrgewichtes    |                |
|--------------------------------------|----------------|
| Für einzelnes Rohr                   | + 12 % / - 8 % |
| Für eine Lieferung minimal 10 Tonnen | + 10 % / - 5 % |

| DIN 17 121                                  |                               |
|---------------------------------------------|-------------------------------|
| Grenzabweichungen des Rohraußendurchmessers | ± 1 % (aber ± 0.5 mm maximal) |
| Grenzabweichungen der Rohrwanddicke         | ebenso im DIN 1629            |
| Grenzabweichung des Rohrgewichtes           |                               |
| Für einzelnes Rohr                          | + 12 % / - 8 %                |
| für eine Lieferung minimal 10 Tonnen        | + 10 % / - 5 %                |

Erläuterungen: D = Außendurchmesser, t = Wanddicke



|                                                        |                                                              |                                                             |
|--------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                 | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                      | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAM                      |
| TRUBKY OCELOVÉ BEZEŠVÉ DODÁVANÉ DLE ZAHRANIČNÍCH NOREM | SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO FOREIGN STANDARDS | NAHTLOSE STAHLROHRE GELIEFERT GEMÄSS INTERNATIONALEN NORMEN |
| Dovolené mezní úchytky rozměrů                         | Permissible Variations on Dimensions                         | Zulässige Grenzabweichungen der Abmessungen                 |

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| DIN 17 172          |                                     |                                                                                               |
|---------------------|-------------------------------------|-----------------------------------------------------------------------------------------------|
| Vnější průměr (mm)  | Mezní úchytky vnějšího průměru      |                                                                                               |
|                     | Tělo trubky                         | Konce trubek                                                                                  |
| < 200               | $\pm 1 \% D$<br>(max. $\pm 0.5$ mm) | $\pm 1 \% D$<br>(max. $\pm 0.5$ mm)<br>lze dohodnout<br>$\pm 0.5 \% D$<br>(max. $\pm 0.4$ mm) |
| $200 \leq D < 500$  | $\pm (0.4\%D+1\text{mm})$           | $\pm 0.7 \% D$                                                                                |
| $500 \leq D < 1200$ | $\pm 0.5 \% D$<br>(max. $\pm 5$ mm) | $\pm 1.6$ mm                                                                                  |

| Mezní úchytky tloušťky stěny                                                                                                                     |                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| pro $D \leq 130$ mm                                                                                                                              | $\pm 10 \%$          |
| pro $D > 130$ mm                                                                                                                                 | $\pm 12.5 \%$        |
| Na jednotlivých místech lze podkročit o 0,5 % tloušťku stěny, a to v délkách menších než je dvojnásobný vnější průměr trubky (max. však 300 mm). |                      |
| Mezní úchytky hmotnosti                                                                                                                          |                      |
| pro jednotlivé trubky                                                                                                                            | $+ 10 \% / - 8.5 \%$ |
| pro vagónovou zásilku min. 10 tun                                                                                                                | $\pm 7.5 \%$         |

| DIN 17 173         |                                     |                   |
|--------------------|-------------------------------------|-------------------|
| Vnější průměr (mm) | Mezní úchytky vnějšího průměru      |                   |
|                    | Tělo trubky                         | Konce trubek      |
| < 100              | $\pm 1 \% D$<br>(max. $\pm 0.5$ mm) | max. $\pm 0.4$ mm |
| $100 \leq D < 200$ | $\pm 1 \% D$                        | $\pm 0.5 \% D$    |
| $D > 200$          | $\pm 1 \% D$                        | $\pm 0.6 \% D$    |

| Mezní úchytky tloušťky stěny                   |                            |                         |
|------------------------------------------------|----------------------------|-------------------------|
| $D \leq 130$ mm                                | $t \leq 2 * t_n$           | $+ 15 \% / - 10 \%$     |
|                                                | $2 * t_n < t \leq 4 * t_n$ | $+ 12.5 \% / - 10 \%$   |
|                                                | $t > 4 * t_n$              | $\pm 9 \%$              |
| $130 < D \leq 320$ mm                          | $t \leq 0.05 D$            | $+ 17.5 \% / - 12.5 \%$ |
|                                                | $0.05 D < t \leq 0.11 D$   | $\pm 12.5 \%$           |
|                                                | $t > 0.11 D$               | $\pm 10 \%$             |
| $320 < D \leq 660$ mm                          | $t \leq 0.05 D$            | $+ 22.5 \% / - 12.5 \%$ |
|                                                | $0.05 D < t \leq 0.09 D$   | $+ 15 \% / - 12.5 \%$   |
|                                                | $t > 0.09 D$               | $+ 12.5 \% / - 10 \%$   |
| $t_n$ – základní tloušťka stěny podle DIN 2448 |                            |                         |

| Mezní úchytky hmotnosti           |                    |
|-----------------------------------|--------------------|
| pro jednotlivé trubky             | $+ 12 \% / - 8 \%$ |
| pro vagónovou zásilku min. 10 tun | $+ 10 \% / - 5 \%$ |

| DIN 17 172            |                                            |                                                                                                   |
|-----------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------|
| Outside diameter (mm) | Permissible Variations of Outside diameter |                                                                                                   |
|                       | Tube                                       | Tube end                                                                                          |
| < 200                 | $\pm 1 \% D$<br>(max. $\pm 0.5$ mm)        | $\pm 1 \% D$<br>(max. $\pm 0.5$ mm)<br>possible to agree<br>$\pm 0.5 \% D$<br>(max. $\pm 0.4$ mm) |
| $200 \leq D < 500$    | $\pm (0.4\%D+1\text{mm})$                  | $\pm 0.7 \% D$                                                                                    |
| $500 \leq D < 1200$   | $\pm 0.5 \% D$<br>(max. $\pm 5$ mm)        | $\pm 1.6$ mm                                                                                      |

| Permissible Variations of Wall thickness                                                                                                              |                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| for $D \leq 130$ mm                                                                                                                                   | $\pm 10 \%$          |
| for $D > 130$ mm                                                                                                                                      | $\pm 12.5 \%$        |
| On various parts wall thickness can fall under by about 0,5 %, but only in lengths shorter than twice the outside diameter of the tube (max. 300 mm). |                      |
| Permissible Variations of Weight                                                                                                                      |                      |
| for individual tubes                                                                                                                                  | $+ 10 \% / - 8.5 \%$ |
| for waggon delivery of at least 10 tons                                                                                                               | $\pm 7.5 \%$         |

| DIN 17 173            |                                            |                   |
|-----------------------|--------------------------------------------|-------------------|
| Outside diameter (mm) | Permissible Variations of Outside diameter |                   |
|                       | Tube                                       | Tube end          |
| < 100                 | $\pm 1 \% D$<br>(max. $\pm 0.5$ mm)        | max. $\pm 0.4$ mm |
| $100 \leq D < 200$    | $\pm 1 \% D$                               | $\pm 0.5 \% D$    |
| $D > 200$             | $\pm 1 \% D$                               | $\pm 0.6 \% D$    |

| Permissible Variations of Wall thickness           |                            |                         |
|----------------------------------------------------|----------------------------|-------------------------|
| $D \leq 130$ mm                                    | $t \leq 2 * t_n$           | $+ 15 \% / - 10 \%$     |
|                                                    | $2 * t_n < t \leq 4 * t_n$ | $+ 12.5 \% / - 10 \%$   |
|                                                    | $t > 4 * t_n$              | $\pm 9 \%$              |
| $130 < D \leq 320$ mm                              | $t \leq 0.05 D$            | $+ 17.5 \% / - 12.5 \%$ |
|                                                    | $0.05 D < t \leq 0.11 D$   | $\pm 12.5 \%$           |
|                                                    | $t > 0.11 D$               | $\pm 10 \%$             |
| $320 < D \leq 660$ mm                              | $t \leq 0.05 D$            | $+ 22.5 \% / - 12.5 \%$ |
|                                                    | $0.05 D < t \leq 0.09 D$   | $+ 15 \% / - 12.5 \%$   |
|                                                    | $t > 0.09 D$               | $+ 12.5 \% / - 10 \%$   |
| $t_n$ – basic wall thickness according to DIN 2448 |                            |                         |

| Permissible Variations of Weight        |                    |
|-----------------------------------------|--------------------|
| for individual tubes                    | $+ 12 \% / - 8 \%$ |
| for waggon delivery of at least 10 tons | $+ 10 \% / - 5 \%$ |

| DIN 17 172            |                                             |                                                                                                     |
|-----------------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Außendurchmesser (mm) | Grenzabweichungen des Rohraußendurchmessers |                                                                                                     |
|                       | Rohr                                        | Rohrende                                                                                            |
| < 200                 | $\pm 1 \% D$<br>(max. $\pm 0.5$ mm)         | $\pm 1 \% D$<br>(max. $\pm 0.5$ mm)<br>es gibt zu vereinbaren $\pm 0.5 \% D$<br>(max. $\pm 0.4$ mm) |
| $200 \leq D < 500$    | $\pm (0.4\%D+1\text{mm})$                   | $\pm 0.7 \% D$                                                                                      |
| $500 \leq D < 1200$   | $\pm 0.5 \% D$<br>(max. $\pm 5$ mm)         | $\pm 1.6$ mm                                                                                        |

| Grenzabweichungen der Rohrwanddicke                                                                                                                               |                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| für $D \leq 130$ mm                                                                                                                                               | $\pm 10 \%$          |
| für $D > 130$ mm                                                                                                                                                  | $\pm 12.5 \%$        |
| Die Wanddicke darf an einzelnen Stellen nicht um 0,5 % nach unten abweichen, wenn die Länge kürzer als der zweifache Rohraußendurchmesser ist (aber max. 300 mm). |                      |
| Grenzabweichung des Rohrgewichtes                                                                                                                                 |                      |
| für einzelnes Rohr                                                                                                                                                | $+ 10 \% / - 8.5 \%$ |
| für Waggonlieferung minimal 10 Tonnen                                                                                                                             | $\pm 7.5 \%$         |

| DIN 17 173            |                                             |                   |
|-----------------------|---------------------------------------------|-------------------|
| Außendurchmesser (mm) | Grenzabweichungen des Rohraußendurchmessers |                   |
|                       | Rohr                                        | Rohrende          |
| < 100                 | $\pm 1 \% D$<br>(max. $\pm 0.5$ mm)         | max. $\pm 0.4$ mm |
| $100 \leq D < 200$    | $\pm 1 \% D$                                | $\pm 0.5 \% D$    |
| $D > 200$             | $\pm 1 \% D$                                | $\pm 0.6 \% D$    |

| Grenzabweichungen der Rohrwanddicke  |                            |                         |
|--------------------------------------|----------------------------|-------------------------|
| $D \leq 130$ mm                      | $t \leq 2 * t_n$           | $+ 15 \% / - 10 \%$     |
|                                      | $2 * t_n < t \leq 4 * t_n$ | $+ 12.5 \% / - 10 \%$   |
|                                      | $t > 4 * t_n$              | $\pm 9 \%$              |
| $130 < D \leq 320$ mm                | $t \leq 0.05 D$            | $+ 17.5 \% / - 12.5 \%$ |
|                                      | $0.05 D < t \leq 0.11 D$   | $\pm 12.5 \%$           |
|                                      | $t > 0.11 D$               | $\pm 10 \%$             |
| $320 < D \leq 660$ mm                | $t \leq 0.05 D$            | $+ 22.5 \% / - 12.5 \%$ |
|                                      | $0.05 D < t \leq 0.09 D$   | $+ 15 \% / - 12.5 \%$   |
|                                      | $t > 0.09 D$               | $+ 12.5 \% / - 10 \%$   |
| $t_n$ – Basiswanddicke nach DIN 2448 |                            |                         |

| Grenzabweichung des Rohrgewichtes     |                    |
|---------------------------------------|--------------------|
| für einzelnes Rohr                    | $+ 12 \% / - 8 \%$ |
| für Waggonlieferung minimal 10 Tonnen | $+ 10 \% / - 5 \%$ |



TRUBKY OCELOVÉ BEZEŠVÉ DODÁVANÉ DLE ZAHRANIČNÍCH NOREM

SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO FOREIGN STANDARDS

NAHTLOSE STAHLROHRE GELIEFERT GEMÄSS INTERNATIONALEN NORMEN

Dovolené mezní úchytky rozměrů

Permissible Variations on Dimensions

Zulässige Grenzabweichungen der Abmessungen

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| DIN 17 175                    |                                                    |
|-------------------------------|----------------------------------------------------|
| Vnější průměr                 | Mezní úchytky                                      |
| $D \leq 100 \text{ mm}$       | $\pm 0.75 \%$ (nejméně však $\pm 0.5 \text{ mm}$ ) |
| $100 < D \leq 320 \text{ mm}$ | $\pm 0.9 \%$                                       |
| $D > 320 \text{ mm}$          | $\pm 1 \%$                                         |

| Mezní úchytky tloušťky stěny                   |                            |                         |
|------------------------------------------------|----------------------------|-------------------------|
| $D \leq 130 \text{ mm}$                        | $t \leq 2 * t_n$           | $+ 15 \% / - 10 \%$     |
|                                                | $2 * t_n < t \leq 4 * t_n$ | $+ 12.5 \% / - 10 \%$   |
|                                                | $t \geq 4 * t_n$           | $\pm 9 \%$              |
| $130 < D \leq 320 \text{ mm}$                  | $t \leq 0.05 D$            | $+ 17.5 \% / - 12.5 \%$ |
|                                                | $0.05 D < t \leq 0.11 D$   | $\pm 12.5 \%$           |
|                                                | $t > 0.11 D$               | $\pm 10 \%$             |
| $320 < D \leq 660 \text{ mm}$                  | $t \leq 0.05 D$            | $+ 22.5 \% / - 12.5 \%$ |
|                                                | $0.05 D < t \leq 0.09 D$   | $+ 15 \% / - 12.5 \%$   |
|                                                | $t > 0.09 D$               | $+ 12.5 \% / - 10 \%$   |
| $t_n$ – základní tloušťka stěny podle DIN 2448 |                            |                         |

| Mezní úchytky hmotnosti           |                    |
|-----------------------------------|--------------------|
| pro jednotlivé trubky             | $+ 10 \% / - 8 \%$ |
| pro vagonovou zásilku min. 10 tun | $\pm 7.5 \%$       |

| DIN 17 176                             |                  |
|----------------------------------------|------------------|
| Mezní úchytky vnějšího průměru         | podle DIN 17 175 |
| Mezní úchytky tloušťky stěny, hmotnost | podle DIN 1629   |

| DIN 17 204                          |                                                                       |
|-------------------------------------|-----------------------------------------------------------------------|
| Mezní úchytky vnějšího průměru      | $\pm 1 \%$<br>(avšak $\pm 0.5 \text{ mm}$ je přípustné)               |
| Mezní úchytky tloušťky stěny trubek | $- 12.5 \%$<br>(horní hranice je dána přípustnou odchylkou hmotnosti) |
| Mezní úchytky hmotnosti             |                                                                       |
| pro jednotlivé trubky               | $+ 12 \% / - 8 \%$                                                    |
| pro vagonovou zásilku min. 10 tun   | $+ 10 \% / - 5 \%$                                                    |

| EN 10 208-2        |                                         |                                                                     |
|--------------------|-----------------------------------------|---------------------------------------------------------------------|
| Vnější průměr (mm) | Mezní úchytky vnějšího průměru          |                                                                     |
|                    | Tělo trubky                             | Konec trubky                                                        |
| $D \leq 60$        | $\pm 0.5 \text{ mm}$ nebo $\pm 0.75 \%$ | $\pm 0.5 \text{ mm}$ nebo $\pm 0.5 D$<br>(platí vždy větší hodnota) |
| $60 < D \leq 610$  | (platí vždy větší hodnota)              | nejvýše však $\pm 1.6 \text{ mm}$                                   |

| Tloušťka stěny | Mezní úchytky tloušťky stěny                                                          |
|----------------|---------------------------------------------------------------------------------------|
| $t \leq 4$     | $+ 0.6 \text{ mm} / - 0.5 \text{ mm}$                                                 |
| $4 < t < 25$   | $+ 15 \% / - 12.5 \%$                                                                 |
| $t \geq 25$    | $+ 3.75 \text{ mm} / - 3.0 \text{ mm}$ nebo $\pm 10 \%$<br>(platí vždy větší hodnota) |

| Mezní úchytky hmotnosti |                      |
|-------------------------|----------------------|
| pro jednotlivou trubku  | $+ 10 \% / - 3.5 \%$ |

Vysvětlivky: D = vnější průměr, t = tloušťka stěny

| DIN 17 175                    |                                                     |
|-------------------------------|-----------------------------------------------------|
| Outside diameter              | Permissible Variations                              |
| $D \leq 100 \text{ mm}$       | $\pm 0.75 \%$ ( but at least $\pm 0.5 \text{ mm}$ ) |
| $100 < D \leq 320 \text{ mm}$ | $\pm 0.9 \%$                                        |
| $D > 320 \text{ mm}$          | $\pm 1 \%$                                          |

| Permissible Variations of Wall thickness           |                            |                         |
|----------------------------------------------------|----------------------------|-------------------------|
| $D \leq 130 \text{ mm}$                            | $t \leq 2 * t_n$           | $+ 15 \% / - 10 \%$     |
|                                                    | $2 * t_n < t \leq 4 * t_n$ | $+ 12.5 \% / - 10 \%$   |
|                                                    | $t \geq 4 * t_n$           | $\pm 9 \%$              |
| $130 < D \leq 320 \text{ mm}$                      | $t \leq 0.05 D$            | $+ 17.5 \% / - 12.5 \%$ |
|                                                    | $0.05 D < t \leq 0.11 D$   | $\pm 12.5 \%$           |
|                                                    | $t > 0.11 D$               | $\pm 10 \%$             |
| $320 < D \leq 660 \text{ mm}$                      | $t \leq 0.05 D$            | $+ 22.5 \% / - 12.5 \%$ |
|                                                    | $0.05 D < t \leq 0.09 D$   | $+ 15 \% / - 12.5 \%$   |
|                                                    | $t > 0.09 D$               | $+ 12.5 \% / - 10 \%$   |
| $t_n$ – basic wall thickness according to DIN 2448 |                            |                         |

| Permissible Variations of Weight        |                    |
|-----------------------------------------|--------------------|
| for individual tubes                    | $+ 10 \% / - 8 \%$ |
| for waggon delivery of at least 10 tons | $\pm 7.5 \%$       |

| DIN 17 176                                 |                         |
|--------------------------------------------|-------------------------|
| Permissible Variations of Outside diameter | according to DIN 17 175 |
| Permissible Variations of Wall thickness   | according to DIN 1629   |

| DIN 17 204                                 |                                                                                 |
|--------------------------------------------|---------------------------------------------------------------------------------|
| Permissible Variations of Outside diameter | $\pm 1 \%$<br>(but $\pm 0.5 \text{ mm}$ is allowed)                             |
| Permissible Variations of Wall thickness   | $- 12.5 \%$<br>(upper limit is done by allowed permissible variation of weight) |
| Permissible Variations of Weight           |                                                                                 |
| for individual tubes                       | $+ 12 \% / - 8 \%$                                                              |
| for waggon delivery of at least 10 tons    | $+ 10 \% / - 5 \%$                                                              |

| EN 10 208-2           |                                            |                                                                                                          |
|-----------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Outside diameter (mm) | Permissible Variations of Outside diameter |                                                                                                          |
|                       | Tube                                       | Tube end                                                                                                 |
| $D \leq 60$           | $\pm 0.5 \text{ mm}$ or $\pm 0.75 \%$      | $\pm 0.5 \text{ mm}$ or $\pm 0.5 D$<br>(higher value is always valid) not more than $\pm 1.6 \text{ mm}$ |
| $60 < D \leq 610$     | (higher value is always valid)             |                                                                                                          |

| Wall thickness | Permissible Variations of Wall thickness                                                |
|----------------|-----------------------------------------------------------------------------------------|
| $t \leq 4$     | $+ 0.6 \text{ mm} / - 0.5 \text{ mm}$                                                   |
| $4 < t < 25$   | $+ 15 \% / - 12.5 \%$                                                                   |
| $t \geq 25$    | $+ 3.75 \text{ mm} / - 3.0 \text{ mm}$ or $\pm 10 \%$<br>(higher value is always valid) |

| Permissible Variations of Weight |                      |
|----------------------------------|----------------------|
| for individual tube              | $+ 10 \% / - 3.5 \%$ |

Legend: D = outside diameter, t = wall thickness

| DIN 17 175                    |                                                    |
|-------------------------------|----------------------------------------------------|
| Außendurchmesser (mm)         | Grenzabweichung                                    |
| $D \leq 100 \text{ mm}$       | $\pm 0.75 \%$ (aber minimal $\pm 0.5 \text{ mm}$ ) |
| $100 < D \leq 320 \text{ mm}$ | $\pm 0.9 \%$                                       |
| $D > 320 \text{ mm}$          | $\pm 1 \%$                                         |

| Grenzabweichungen der Rohrwanddicke                   |                            |                         |
|-------------------------------------------------------|----------------------------|-------------------------|
| $D \leq 130 \text{ mm}$                               | $t \leq 2 * t_n$           | $+ 15 \% / - 10 \%$     |
|                                                       | $2 * t_n < t \leq 4 * t_n$ | $+ 12.5 \% / - 10 \%$   |
|                                                       | $t \geq 4 * t_n$           | $\pm 9 \%$              |
| $130 < D \leq 320 \text{ mm}$                         | $t \leq 0.05 D$            | $+ 17.5 \% / - 12.5 \%$ |
|                                                       | $0.05 D < t \leq 0.11 D$   | $\pm 12.5 \%$           |
|                                                       | $t > 0.11 D$               | $\pm 10 \%$             |
| $320 < D \leq 660 \text{ mm}$                         | $t \leq 0.05 D$            | $+ 22.5 \% / - 12.5 \%$ |
|                                                       | $0.05 D < t \leq 0.09 D$   | $+ 15 \% / - 12.5 \%$   |
|                                                       | $t > 0.09 D$               | $+ 12.5 \% / - 10 \%$   |
| $t_n$ – grundlegende Wanddicke nach der Norm DIN 2448 |                            |                         |

| Grenzabweichung des Rohrgewichtes     |                    |
|---------------------------------------|--------------------|
| für ein Einzelrohr                    | $+ 10 \% / - 8 \%$ |
| für Waggonlieferung minimal 10 Tonnen | $\pm 7.5 \%$       |

| DIN 17 176                                             |                   |
|--------------------------------------------------------|-------------------|
| Grenzabweichungen des Rohraußendurchmessers            | gemäss DIN 17 175 |
| Grenzabweichungen der Rohrwanddicke, des Rohrgewichtes | gemäss DIN 1629   |

| DIN 17 204                                  |                                                                     |
|---------------------------------------------|---------------------------------------------------------------------|
| Grenzabweichungen des Rohraußendurchmessers | $\pm 1 \%$<br>(aber $\pm 0.5 \text{ mm}$ maximal)                   |
| Grenzabweichungen der Rohrwanddicke         | $- 12.5 \%$<br>(die obere Grenze ist die zulässige Grenzabweichung) |
| Grenzabweichung des Rohrgewichtes           |                                                                     |
| für einzelnes Rohr                          | $+ 12 \% / - 8 \%$                                                  |
| für Waggonlieferung minimal 10 Tonnen       | $+ 10 \% / - 5 \%$                                                  |

| EN 10 208-2           |                                             |                                                                 |
|-----------------------|---------------------------------------------|-----------------------------------------------------------------|
| Außendurchmesser (mm) | Grenzabweichungen des Rohraußendurchmessers |                                                                 |
|                       | Rohr                                        | Rohrende                                                        |
| $D \leq 60$           | $\pm 0.5 \text{ mm}$ oder $\pm 0.75 \%$     | Rohrende $\pm 0.5 \text{ mm}$ oder $\pm 0.5 D$                  |
| $60 < D \leq 610$     | (gültig ist der größere Wert)               | (gültig ist der größere Wert) aber maximal $\pm 1.6 \text{ mm}$ |

| Rohrwanddicke | Grenzabweichungen der Rohrwanddicke                                                      |
|---------------|------------------------------------------------------------------------------------------|
| $t \leq 4$    | $+ 0.6 \text{ mm} / - 0.5 \text{ mm}$                                                    |
| $4 < t < 25$  | $+ 15 \% / - 12.5 \%$                                                                    |
| $t \geq 25$   | $+ 3.75 \text{ mm} / - 3.0 \text{ mm}$ oder $\pm 10 \%$<br>(gültig ist der größere Wert) |

| Grenzabweichung des Rohrgewichtes |                      |
|-----------------------------------|----------------------|
| für ein Einzelrohr                | $+ 10 \% / - 3.5 \%$ |

Erläuterungen: D = Außendurchmesser, t = Wanddicke



|                                                        |                                                              |                                                             |
|--------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|
| OCÉLOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                 | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                      | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAM                      |
| TRUBKY OCÉLOVÉ BEZEŠVÉ DODÁVANÉ DLE ZAHRANIČNÍCH NOREM | SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO FOREIGN STANDARDS | NAHTLOSE STAHLROHRE DELIEFERT GEMÄSS INTERNATIONALEN NORMEN |
| Dovolené mezní úchytky rozměrů                         | Permissible Variations on Dimensions                         | Zulässige Grenzabweichungen der Abmessungen                 |

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| EN 10 210-2                                                                |                                                  |
|----------------------------------------------------------------------------|--------------------------------------------------|
| Mezní úchytky vnějšího průměru                                             | $\pm 1\%$<br>min. $\pm 0.5$ mm. max. $\pm 10$ mm |
| Mezní úchytky tloušťky stěny                                               | $-10\%$ .<br>+ je omezeno úchytkou hmotnosti     |
| Je možná max. úchytky $-12.5\%$ v přechodových oblastech na $25\%$ obvodu. |                                                  |
| Mezní úchytky hmotnosti pro jednotlivou trubku                             | $\pm 6\%$<br>(je možná max. úchytky $+8\%$ )     |

| EN 10 216-1 a 4                                                   |                                                        |                                                           |                         |                       |             |
|-------------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|-------------------------|-----------------------|-------------|
| Vnější průměr (mm)                                                | Tolerance na průměr                                    | Tolerance na tloušťku stěny podle poměru t/D              |                         |                       |             |
|                                                                   |                                                        | t/D $\leq 0.025$                                          | $0.025 < t/D \leq 0.05$ | $0.05 < t/D \leq 0.1$ | t/D $> 0.1$ |
| D $\leq 219.1$                                                    | $\pm 1\%$ nebo $\pm 0.5$ mm (platí vždy větší hodnota) | $\pm 12.5\%$ nebo $\pm 0.4$ mm (platí vždy větší hodnota) |                         |                       |             |
| D $> 219.1$                                                       |                                                        | $\pm 20\%$                                                | $\pm 15\%$              | $\pm 12.5\%$          | $\pm 10\%$  |
| * Pro D $\geq 355.6$ mm je možno toleranci lokálně zvýšit o $5\%$ |                                                        |                                                           |                         |                       |             |

| EN 10 216-2 a 3                                                                                                               |                                                        |                                                           |                         |                       |             |
|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|-------------------------|-----------------------|-------------|
| Vnější průměr (mm)                                                                                                            | Tolerance na průměr                                    | Tolerance na tloušťku stěny podle poměru t/D              |                         |                       |             |
|                                                                                                                               |                                                        | t/D $\leq 0.025$                                          | $0.025 < t/D \leq 0.05$ | $0.05 < t/D \leq 0.1$ | t/D $> 0.1$ |
| D $\leq 219.1$                                                                                                                | $\pm 1\%$ nebo $\pm 0.5$ mm (platí vždy větší hodnota) | $\pm 12.5\%$ nebo $\pm 0.4$ mm (platí vždy větší hodnota) |                         |                       |             |
| D $> 219.1$                                                                                                                   |                                                        | $\pm 20\%$                                                | $\pm 15\%$              | $\pm 12.5\%$          | $\pm 10\%$  |
| Dále existují tolerance pro kombinace tolerancí na vnitřní průměr a tloušťku stěny, vnější průměr a minimální tloušťku stěny. |                                                        |                                                           |                         |                       |             |

| EN 10297-1         |                                                        |                                                           |                         |              |
|--------------------|--------------------------------------------------------|-----------------------------------------------------------|-------------------------|--------------|
| Vnější průměr (mm) | Tolerance na průměr                                    | Tolerance na tloušťku stěny podle poměru t/D              |                         |              |
|                    |                                                        | t/D $\leq 0.025$                                          | $0.025 < t/D \leq 0.05$ | t/D $> 0.05$ |
| D $\leq 219.1$     | $\pm 1\%$ nebo $\pm 0.5$ mm (platí vždy větší hodnota) | $\pm 12.5\%$ nebo $\pm 0.4$ mm (platí vždy větší hodnota) |                         |              |
| D $> 219.1$        |                                                        | $\pm 20\%$                                                | $\pm 15\%$              | $\pm 12.5\%$ |

| EN 10 210-2                                                         |                                                      |
|---------------------------------------------------------------------|------------------------------------------------------|
| Permissible Variations of Outside diameter                          | $\pm 1\%$<br>min. $\pm 0.5$ mm. max. $\pm 10$ mm     |
| Permissible Variations of Wall thickness                            | $-10\%$ .<br>+ it is limited by weight tolerance     |
| It is possible max. tolerance $-12.5\%$ for $25\%$ of the diameter. |                                                      |
| Permissible Variations of Weight for individual tube                | $\pm 6\%$<br>(it is possible max. tolerance $+8\%$ ) |

| EN 10 216-1 and 4                                                                     |                                                          |                                                                 |                         |                       |             |
|---------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------|-------------------------|-----------------------|-------------|
| Outside diameter (mm)                                                                 | Permissible Variations of Outside diameter               | Permissible Variations of Wall thickness according to ratio t/D |                         |                       |             |
|                                                                                       |                                                          | t/D $\leq 0.025$                                                | $0.025 < t/D \leq 0.05$ | $0.05 < t/D \leq 0.1$ | t/D $> 0.1$ |
| D $\leq 219.1$                                                                        | $\pm 1\%$ or $\pm 0.5$ mm (higher value is always valid) | $\pm 12.5\%$ or $\pm 0.4$ mm (higher value is always valid)     |                         |                       |             |
| D $> 219.1$                                                                           |                                                          | $\pm 20\%$                                                      | $\pm 15\%$              | $\pm 12.5\%$          | $\pm 10\%$  |
| * For D $\geq 355.6$ mm it is possible to increase the local tolerance by about $5\%$ |                                                          |                                                                 |                         |                       |             |

| EN 10 216-2 and 3                                                                                                                                                                      |                                                          |                                                                 |                         |                       |             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------|-------------------------|-----------------------|-------------|
| Outside diameter (mm)                                                                                                                                                                  | Permissible Variations of Outside diameter               | Permissible Variations of Wall thickness according to ratio t/D |                         |                       |             |
|                                                                                                                                                                                        |                                                          | t/D $\leq 0.025$                                                | $0.025 < t/D \leq 0.05$ | $0.05 < t/D \leq 0.1$ | t/D $> 0.1$ |
| D $\leq 219.1$                                                                                                                                                                         | $\pm 1\%$ or $\pm 0.5$ mm (higher value is always valid) | $\pm 12.5\%$ or $\pm 0.4$ mm (higher value is always valid)     |                         |                       |             |
| D $> 219.1$                                                                                                                                                                            |                                                          | $\pm 20\%$                                                      | $\pm 15\%$              | $\pm 12.5\%$          | $\pm 10\%$  |
| There are also tolerances for combination of tolerances for inner diameter and wall thickness, outside diameter and minimum wall thickness, inner diameter and minimum wall thickness. |                                                          |                                                                 |                         |                       |             |

| EN 10297-1            |                                                          |                                                                 |                         |              |
|-----------------------|----------------------------------------------------------|-----------------------------------------------------------------|-------------------------|--------------|
| Outside diameter (mm) | Permissible Variations of Outside diameter               | Permissible Variations of Wall thickness according to ratio t/D |                         |              |
|                       |                                                          | t/D $\leq 0.025$                                                | $0.025 < t/D \leq 0.05$ | t/D $> 0.05$ |
| D $\leq 219.1$        | $\pm 1\%$ or $\pm 0.5$ mm (higher value is always valid) | $\pm 12.5\%$ or $\pm 0.4$ mm (higher value is always valid)     |                         |              |
| D $> 219.1$           |                                                          | $\pm 20\%$                                                      | $\pm 15\%$              | $\pm 12.5\%$ |

| EN 10 210-2                                                                                 |                                                        |
|---------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Grenzabweichungen des Rohraußendurchmessers                                                 | $\pm 1\%$<br>min. $\pm 0.5$ mm. max. $\pm 10$ mm       |
| Grenzabweichungen der Rohrwanddicke                                                         | $-10\%$ .<br>+ begrenzt mit dem Gewicht                |
| Möglich maximal Grenzabweichung $-12.5\%$ in den Übergangsbereichen auf $25\%$ des Umfangs. |                                                        |
| Grenzabweichung des Rohrgewichtes für ein Einzelrohr                                        | $\pm 6\%$<br>(möglich maximal Grenzabweichung $+8\%$ ) |

| EN 10 216-1 und 4                                                                   |                                                           |                                                              |                         |                       |             |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------|-------------------------|-----------------------|-------------|
| Außendurchmesser (mm)                                                               | Grenzabweichungen des Rohraußendurchmessers               | Grenzabweichungen des Rohrwanddicke nach Verhältnis t/D      |                         |                       |             |
|                                                                                     |                                                           | t/D $\leq 0.025$                                             | $0.025 < t/D \leq 0.05$ | $0.05 < t/D \leq 0.1$ | t/D $> 0.1$ |
| D $\leq 219.1$                                                                      | $\pm 1\%$ oder $\pm 0.5$ mm (gültig ist der größere Wert) | $\pm 12.5\%$ oder $\pm 0.4$ mm (gültig ist der größere Wert) |                         |                       |             |
| D $> 219.1$                                                                         |                                                           | $\pm 20\%$                                                   | $\pm 15\%$              | $\pm 12.5\%$          | $\pm 10\%$  |
| * Für D $\geq 355.6$ mm ist es möglich, die Toleranzen örtlich um $5\%$ zu erhöhen. |                                                           |                                                              |                         |                       |             |

| EN 10 216-2 und 3                                                                                                                                                                   |                                                           |                                                              |                         |                       |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------|-------------------------|-----------------------|-------------|
| Außendurchmesser (mm)                                                                                                                                                               | Grenzabweichungen des Rohraußendurchmessers               | Grenzabweichungen des Rohrwanddicke nach Verhältnis t/D      |                         |                       |             |
|                                                                                                                                                                                     |                                                           | t/D $\leq 0.025$                                             | $0.025 < t/D \leq 0.05$ | $0.05 < t/D \leq 0.1$ | t/D $> 0.1$ |
| D $\leq 219.1$                                                                                                                                                                      | $\pm 1\%$ oder $\pm 0.5$ mm (gültig ist der größere Wert) | $\pm 12.5\%$ oder $\pm 0.4$ mm (gültig ist der größere Wert) |                         |                       |             |
| D $> 219.1$                                                                                                                                                                         |                                                           | $\pm 20\%$                                                   | $\pm 15\%$              | $\pm 12.5\%$          | $\pm 10\%$  |
| Es besteht weiter Toleranzen für die Toleranzkombination von Innendurchmesser und Wanddicke, von Außendurchmesser und min. Wanddicke sowie von Innendurchmesser und min. Wanddicke. |                                                           |                                                              |                         |                       |             |

| EN 10297-1            |                                                           |                                                              |                         |              |
|-----------------------|-----------------------------------------------------------|--------------------------------------------------------------|-------------------------|--------------|
| Außendurchmesser (mm) | Grenzabweichungen des Rohraußendurchmessers               | Grenzabweichungen des Rohrwanddicke nach Verhältnis t/D      |                         |              |
|                       |                                                           | t/D $\leq 0.025$                                             | $0.025 < t/D \leq 0.05$ | t/D $> 0.05$ |
| D $\leq 219.1$        | $\pm 1\%$ oder $\pm 0.5$ mm (gültig ist der größere Wert) | $\pm 12.5\%$ oder $\pm 0.4$ mm (gültig ist der größere Wert) |                         |              |
| D $> 219.1$           |                                                           | $\pm 20\%$                                                   | $\pm 15\%$              | $\pm 12.5\%$ |

TRUBKY OCELOVÉ BEZEŠVÉ DODÁVANÉ DLE  
ZAHRA NIČNÍCH NOREM

SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO  
FOREIGN STANDARDS

NAHTLOSE STAHLROHRE GELIEFERT GEMÄSS  
INTERNATIONALEN NORMEN

Dovolené mezní úchytky rozměrů

### Permissible Variations on Dimensions

### Zulässige Grenzabweichungen der Abmessungen

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| Vnější průměr (mm) | Tloušťka stěny (mm) | Mezní úchytky tloušťky stěny |                        |
|--------------------|---------------------|------------------------------|------------------------|
|                    |                     | s vyšší přesností            | s běžnou přesností     |
| do 219             | do 15 včetně        | ± 12,5 %                     | + 12,5 % /<br>– 15,0 % |
|                    | od 15 do 30         | + 10,0 % /<br>– 12,5 %       | ± 12,5 %               |
|                    | nad 30              | ± 10,0 %                     | + 10,0 % /<br>– 12,5 % |
| nad 219            | do 15 včetně        | + 12,5 % /<br>– 15,0 %       |                        |
|                    | od 15 do 30         | ± 12,5 %                     |                        |
|                    | nad 30              | + 10,0 % /<br>– 12,5 %       |                        |

| NF A 49-112                           |                     |                                     |
|---------------------------------------|---------------------|-------------------------------------|
| Mezní úchytky vnějšího průměru trubek |                     | ±1%                                 |
| Mezní úchytky tloušťky stěny          |                     |                                     |
| Vnější průměr                         | t nebo t/D          | Tolerance                           |
| D ≤ 101.6                             | t ≤ 10<br>t > 10    | ± 12.5 %<br>min. ± 0.5 mm<br>± 10 % |
| D > 101.6                             | t/D > 0.100         | ± 10 %                              |
|                                       | 0.050 < t/D ≤ 0.100 | ± 12.5 %                            |
|                                       | 0.025 < t/D ≤ 0.050 | ± 15 %                              |
|                                       | t/D ≤ 0.025         | ± 20 %                              |

| Mezní úchytky hmotnosti      |         |
|------------------------------|---------|
| pro dodávku menší než 10 tun | ± 10 %  |
| pro dodávku větší než 10 tun | ± 7.5 % |

| NF A 49-211                     |                                 |
|---------------------------------|---------------------------------|
| Vnější průměr                   | Mezní úchylnka vnějšího průměru |
| $60,3 \leq D \leq 114,3$<br>mm  | + 0,8 mm / - 0,8 mm             |
| $139,7 \leq D \leq 219,1$<br>mm | + 1,6 mm / - 0,8 mm             |
| $273 \leq D \leq 457$<br>mm     | + 2,4 mm / - 0,8 mm             |

| Tloušťka stěny               | Mezní úchylka tloušťky stěny |
|------------------------------|------------------------------|
| $3.2 < t \leq 20 \text{ mm}$ | $+ 0.15 * t ; - 0.125 * t$   |
| $t > 20 \text{ mm}$          | $\pm 0.125 * t$              |

|                              |                  |
|------------------------------|------------------|
| Mezní úchyly hmotnosti       |                  |
| pro jednotlivé trubky        | + 10 % / – 3.5 % |
| pro dodávku větší než 18 tun | – 1.75 %         |

| NF A 49-311                           |                             |
|---------------------------------------|-----------------------------|
| Mezní úchytky vnějšího průměru trubek | ±1% (nejméně však ± 0.5 mm) |

| Tloušťka stěny | Mezní úchylka tloušťky stěny   |
|----------------|--------------------------------|
| t ≤ 20 mm      | ± 15 % (nejméně však ± 0,5 mm) |
| t > 20 mm      | ± 12,5 % (nejméně však ± 3 mm) |

|                              |                |
|------------------------------|----------------|
| Mezní úchytky hmotnosti      |                |
| pro jednotlivé trubky        | + 10 % / - 8 % |
| pro dodávku větší než 10 tun | ± 7.5 %        |

Vysvětlivky: D = vnější průměr, t = tloušťka stěny

| Outside diameter<br>(mm) | Wall thickness<br>(mm) | Permissible Variations<br>of Wall thickness |                         |
|--------------------------|------------------------|---------------------------------------------|-------------------------|
|                          |                        | with higher<br>accuracy                     | with common<br>accuracy |
| up to 219                | up to 15<br>including  | ± 12.5 %                                    | + 12.5 % /<br>– 15.0 %  |
|                          | from 15<br>to 30       | + 10.0 % /<br>– 12.5 %                      | ± 12.5 %                |
|                          | over 30                | ± 10.0 %                                    | + 10.0 % /<br>– 12.5 %  |
| over 219                 | up to 15<br>including  | + 12.5 % /<br>– 15.0 %                      |                         |
|                          | from 15<br>to 30       | ± 12.5 %                                    |                         |
|                          | over 30                | + 10.0 % /<br>– 12.5 %                      |                         |

| NF A 49-112                                |                     |                                     |
|--------------------------------------------|---------------------|-------------------------------------|
| Permissible Variations of Outside diameter |                     | ±1%                                 |
| Permissible Variations of Wall thickness   |                     |                                     |
| Outside diameter                           | t or t/D            | Permissible Variations              |
| D ≤ 101.6                                  | t ≤ 10<br>t > 10    | ± 12.5 %<br>min. ± 0.5 mm<br>± 10 % |
| D > 101.6                                  | t/D > 0.100         | ± 10 %                              |
|                                            | 0.050 < t/D ≤ 0.100 | ± 12.5 %                            |
|                                            | 0.025 < t/D ≤ 0.050 | ± 15 %                              |
|                                            | t/D ≤ 0.025         | ± 20 %                              |

| Permissible Variations of Weight  |         |
|-----------------------------------|---------|
| for delivery smaller than 10 tons | ± 10 %  |
| for delivery bigger than 10 tons  | ± 7.5 % |

| NF A 49-211                     |                                            |
|---------------------------------|--------------------------------------------|
| Outside diameter                | Permissible Variations of Outside diameter |
| $60.3 \leq D \leq 114.3$<br>mm  | + 0.8 mm / - 0.8 mm                        |
| $139.7 \leq D \leq 219.1$<br>mm | + 1.6 mm / - 0.8 mm                        |
| $273 \leq D \leq 457$<br>mm     | + 2.4 mm / - 0.8 mm                        |

| Wall thickness               | Permissible Variations of Wall thickness |
|------------------------------|------------------------------------------|
| $3.2 < t \leq 20 \text{ mm}$ | $+ 0.15 * t ; - 0.125 * t$               |
| $t > 20 \text{ mm}$          | $\pm 0.125 * t$                          |

| Permissible Variations of Weight |                  |
|----------------------------------|------------------|
| for individual tubes             | + 10 % / - 3.5 % |
| for delivery of at least 18 tons | - 1.75 %         |

| NF A 49-311                                |                        |
|--------------------------------------------|------------------------|
| Permissible Variations of Outside diameter | ±1% (but min. ±0.5 mm) |

| Wall thickness         | Permissible Variations of Wall thickness     |
|------------------------|----------------------------------------------|
| $t \leq 20 \text{ mm}$ | $\pm 15 \%$ (but min. $\pm 0.5 \text{ mm}$ ) |
| $t > 20 \text{ mm}$    | $\pm 12.5 \%$ (but min. $\pm 3 \text{ mm}$ ) |

| Permissible Variations of Weight |                |
|----------------------------------|----------------|
| for individual tubes             | + 10 % / - 8 % |
| for delivery of at least 10 tons | ± 7.5 %        |

Legend: D = outside diameter, t = wall thickness

| Außendurchmesser (mm) | Wanddicke (mm)        | Grenzabweichungen der Rohrwanddicke |                         |
|-----------------------|-----------------------|-------------------------------------|-------------------------|
|                       |                       | mit höhere Genauigkeit              | mit übliche Genauigkeit |
| bis 219               | bis 15 einschließlich | ± 12,5 %                            | + 12,5 % /<br>– 15,0 %  |
|                       | von 15 do 30          | + 10,0 % /<br>– 12,5 %              | ± 12,5 %                |
|                       | über 30               | ± 10,0 %                            | + 10,0 % /<br>– 12,5 %  |
| über 219              | bis 15 einschließlich | + 12,5 % /<br>– 15,0 %              |                         |
|                       | von 15 bis 30         | ± 12,5 %                            |                         |
|                       | über 30               | + 10,0 % /<br>– 12,5 %              |                         |

| NF A 49-112                                    |                        |                                     |
|------------------------------------------------|------------------------|-------------------------------------|
| Grenzabweichungen<br>des Rohraußendurchmessers |                        | ±1%                                 |
| Grenzabweichungen der Rohrwanddicke            |                        |                                     |
| Außendurch-<br>messer                          | t oder t/D             | Grenzabwei-<br>chung                |
| D ≤ 101.6                                      | t ≤ 10<br>t > 10       | ± 12.5 %<br>min. ± 0.5 mm<br>± 10 % |
| D > 101.6                                      | t/D > 0.100            | ± 10 %                              |
|                                                | 0.050 < t/D ≤<br>0.100 | ± 12.5 %                            |
|                                                | 0.025 < t/D ≤<br>0.050 | ± 15 %                              |
|                                                | t/D ≤ 0.025            | ± 20 %                              |

| Grenzabweichung des Rohrgewichtes |         |
|-----------------------------------|---------|
| Für Lieferung < 10 Tonnen         | ± 10 %  |
| Für Lieferung > 10 Tonnen         | ± 7.5 % |

| NF A 49-211                     |                                             |
|---------------------------------|---------------------------------------------|
| Außendurchmesser                | Grenzabweichungen des Rohraußendurchmessers |
| $60.3 \leq D \leq 114.3$<br>mm  | + 0.8 mm / - 0.8 mm                         |
| $139.7 \leq D \leq 219.1$<br>mm | + 1.6 mm / - 0.8 mm                         |
| $273 \leq D \leq 457$<br>mm     | + 2.4 mm / - 0.8 mm                         |

| Rohrwanddicke                | Grenzabweichungen<br>der Rohrwanddicke |
|------------------------------|----------------------------------------|
| $3,2 < t \leq 20 \text{ mm}$ | $+ 0,15 * t; - 0,125 * t$              |
| $t > 20 \text{ mm}$          | $\pm 0,125 * t$                        |

| Grenzabweichung des Rohrgewichtes |                  |
|-----------------------------------|------------------|
| Für ein Einzelrohr                | + 10 % / - 3.5 % |
| Für Lieferung >18 Tonnen          | - 1.75 %         |

|                                                |                                  |
|------------------------------------------------|----------------------------------|
| NF A 49-311                                    |                                  |
| Grenzabweichungen<br>des Rohraußendurchmessers | ±1% (aber mini-<br>mal ± 0.5 mm) |

| Rohrwanddicke          | Grenzabweichungen<br>der Rohrwanddicke           |
|------------------------|--------------------------------------------------|
| $t \leq 20 \text{ mm}$ | $\pm 15 \%$ (aber minimal $\pm 0,5 \text{ mm}$ ) |
| $t > 20 \text{ mm}$    | $\pm 12,5 \%$ (aber minimal $\pm 3 \text{ mm}$ ) |

| Grenzabweichung des Rohrgewichtes |                |
|-----------------------------------|----------------|
| Für ein Einzelrohr                | + 10 % / – 8 % |
| Für Lieferung > 10 Tonnen         | ± 7.5 %        |

Die Erklärungen: D = Außendurchmesser, t = Wanddicke



|                                                        |                                                              |                                                             |
|--------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                 | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                      | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM                     |
| TRUBKY OCELOVÉ BEZEŠVÉ DODÁVANÉ DLE ZAHRANIČNÍCH NOREM | SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO FOREIGN STANDARDS | NAHTLOSE STAHLROHRE DELIEFERT GEMÄSS INTERNATIONALEN NORMEN |
| Rozměrová norma<br>ANSI/ASME B 36.10M-1985             | Dimensional standard<br>ANSI/ASME B 36.10M-1985              | Massnorm gemäss<br>ANSI/ASME B 36.10M-1985                  |

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| ROZMĚROVÁ NORMA<br>ANSI/ASME B 36.10M-1985 |                  |                | DIMENSIONAL STANDARD<br>ANSI/ASME B 36.10M-1985 |            |              | MASSNORM GEMÄSS<br>ANSI/ASME B 36.10M-1985 |                |                  |
|--------------------------------------------|------------------|----------------|-------------------------------------------------|------------|--------------|--------------------------------------------|----------------|------------------|
| NPS                                        | Vnější průměr    | Tloušťka stěny | Hmotnost                                        | STD/XS/XXS | Schedule No. | Vnější průměr                              | Tloušťka stěny | Hmotnost metrová |
| NPS                                        | Outside diameter | Wall thickness | Weight                                          | STD/XS/XXS | Schedule No. | Outside diameter                           | Wall thickness | Weight per meter |
| NPS                                        | Außendurchmesser | Wanddicke      | Gewicht                                         | STD/XS/XXS | Schedule No. | Außendurchmesser                           | Wanddicke      | Metergewicht     |
| (inch)                                     | (inch)           | (inch)         | (lb/ft)                                         |            |              | (mm)                                       | (mm)           | (kg/m)           |
| 2                                          | 2.375            | 0.25           | 5.67                                            |            |              | 60.3                                       | 6.35           | 8.45             |
| 2                                          | 2.375            | 0.281          | 6.28                                            |            |              | 60.3                                       | 7.14           | 9.36             |
| 2                                          | 2.375            | 0.344          | 7.46                                            |            | 160          | 60.3                                       | 8.74           | 11.11            |
| 2                                          | 2.375            | 0.436          | 9.03                                            | XXS        |              | 60.3                                       | 11.07          | 13.44            |
| 3                                          | 3.5              | 0.216          | 7.58                                            | STD        | 40           | 88.9                                       | 5.49           | 11.29            |
| 3                                          | 3.5              | 0.25           | 8.68                                            |            |              | 88.9                                       | 6.35           | 12.93            |
| 3                                          | 3.5              | 0.281          | 9.66                                            |            |              | 88.9                                       | 7.14           | 14.4             |
| 3                                          | 3.5              | 0.3            | 10.25                                           | XS         | 80           | 88.9                                       | 7.62           | 15.27            |
| 3                                          | 3.5              | 0.438          | 14.32                                           |            | 160          | 88.9                                       | 11.13          | 21.35            |
| 3                                          | 3.5              | 0.6            | 18.58                                           | XXS        |              | 88.9                                       | 15.24          | 27.68            |
| 3 1/2                                      | 4                | 0.226          | 9.11                                            | STD        | 40           | 101.6                                      | 5.74           | 13.57            |
| 3 1/2                                      | 4                | 0.25           | 10.01                                           |            |              | 101.6                                      | 6.35           | 14.92            |
| 3 1/2                                      | 4                | 0.281          | 11.16                                           |            |              | 101.6                                      | 7.14           | 16.63            |
| 3 1/2                                      | 4                | 0.318          | 12.5                                            | XS         | 80           | 101.6                                      | 8.08           | 18.63            |
| 4                                          | 4.5              | 0.219          | 10.01                                           |            |              | 114.3                                      | 5.56           | 14.91            |
| 4                                          | 4.5              | 0.237          | 10.79                                           | STD        | 40           | 114.3                                      | 6.02           | 16.07            |
| 4                                          | 4.5              | 0.25           | 11.35                                           |            |              | 114.3                                      | 6.35           | 16.9             |
| 4                                          | 4.5              | 0.281          | 12.66                                           |            |              | 114.3                                      | 7.14           | 18.87            |
| 4                                          | 4.5              | 0.312          | 13.96                                           |            |              | 114.3                                      | 7.92           | 20.78            |
| 4                                          | 4.5              | 0.337          | 14.98                                           | XS         | 80           | 114.3                                      | 8.56           | 22.32            |
| 4                                          | 4.5              | 0.438          | 19                                              |            | 120          | 114.3                                      | 11.13          | 28.32            |
| 4                                          | 4.5              | 0.531          | 22.51                                           |            | 160          | 114.3                                      | 13.49          | 33.54            |
| 4                                          | 4.5              | 0.674          | 27.54                                           | XXS        |              | 114.3                                      | 17.12          | 41.03            |
| 5                                          | 5.563            | 0.258          | 14.62                                           | STD        | 40           | 141.3                                      | 6.55           | 21.77            |
| 5                                          | 5.563            | 0.281          | 15.85                                           |            |              | 141.3                                      | 7.14           | 23.62            |
| 5                                          | 5.563            | 0.312          | 17.5                                            |            |              | 141.3                                      | 7.92           | 26.05            |
| 5                                          | 5.563            | 0.344          | 19.17                                           |            |              | 141.3                                      | 8.74           | 28.57            |
| 5                                          | 5.563            | 0.375          | 20.78                                           | XS         | 80           | 141.3                                      | 9.53           | 30.97            |
| 5                                          | 5.563            | 0.5            | 27.04                                           |            | 120          | 141.3                                      | 12.7           | 40.28            |
| 5                                          | 5.563            | 0.625          | 32.96                                           |            | 160          | 141.3                                      | 15.88          | 49.11            |
| 5                                          | 5.563            | 0.75           | 38.55                                           | XXS        |              | 141.3                                      | 19.05          | 57.43            |
| 6                                          | 6.625            | 0.25           | 17.02                                           |            |              | 168.3                                      | 6.35           | 25.36            |
| 6                                          | 6.625            | 0.28           | 18.97                                           | STD        | 40           | 168.3                                      | 7.11           | 28.26            |
| 6                                          | 6.625            | 0.312          | 21.04                                           |            |              | 168.3                                      | 7.92           | 31.32            |
| 6                                          | 6.625            | 0.344          | 23.08                                           |            |              | 168.3                                      | 8.74           | 34.39            |
| 6                                          | 6.625            | 0.375          | 25.03                                           |            |              | 168.3                                      | 9.53           | 37.31            |
| 6                                          | 6.625            | 0.432          | 28.57                                           | XS         | 80           | 168.3                                      | 10.97          | 42.56            |
| 6                                          | 6.625            | 0.5            | 32.71                                           |            |              | 168.3                                      | 12.7           | 48.73            |
| 6                                          | 6.625            | 0.562          | 36.39                                           |            | 120          | 168.3                                      | 14.27          | 54.2             |
| 6                                          | 6.625            | 0.625          | 40.05                                           |            |              | 168.3                                      | 15.88          | 59.69            |
| 6                                          | 6.625            | 0.719          | 45.35                                           |            | 160          | 168.3                                      | 18.26          | 67.56            |
| 6                                          | 6.625            | 0.75           | 47.06                                           |            |              | 168.3                                      | 19.05          | 70.11            |
| 6                                          | 6.625            | 0.864          | 53.16                                           | XXS        |              | 168.3                                      | 21.95          | 79.22            |
| 6                                          | 6.625            | 0.875          | 53.73                                           |            |              | 168.3                                      | 22.23          | 80.07            |
| 8                                          | 8.625            | 0.25           | 22.36                                           |            | 20           | 219.1                                      | 6.35           | 33.31            |
| 8                                          | 8.625            | 0.277          | 24.7                                            |            | 30           | 219.1                                      | 7.04           | 36.81            |
| 8                                          | 8.625            | 0.312          | 27.7                                            |            |              | 219.1                                      | 7.92           | 41.24            |
| 8                                          | 8.625            | 0.322          | 28.55                                           | STD        | 40           | 219.1                                      | 8.18           | 42.55            |
| 8                                          | 8.625            | 0.344          | 30.42                                           |            |              | 219.1                                      | 8.74           | 45.34            |
| 8                                          | 8.625            | 0.375          | 33.04                                           |            |              | 219.1                                      | 9.53           | 49.25            |
| 8                                          | 8.625            | 0.406          | 35.64                                           |            | 60           | 219.1                                      | 10.31          | 53.08            |
| 8                                          | 8.625            | 0.438          | 38.3                                            |            |              | 219.1                                      | 11.13          | 57.08            |
| 8                                          | 8.625            | 0.5            | 43.39                                           | XS         | 80           | 219.1                                      | 12.7           | 64.64            |
| 8                                          | 8.625            | 0.562          | 48.4                                            |            |              | 219.1                                      | 14.27          | 72.08            |
| 8                                          | 8.625            | 0.594          | 50.95                                           |            | 100          | 219.1                                      | 15.09          | 75.92            |
| 8                                          | 8.625            | 0.625          | 53.4                                            |            |              | 219.1                                      | 15.88          | 79.58            |
| 8                                          | 8.625            | 0.719          | 60.71                                           |            | 120          | 219.1                                      | 18.26          | 90.44            |
| 8                                          | 8.625            | 0.75           | 63.08                                           |            |              | 219.1                                      | 19.05          | 93.98            |
| 8                                          | 8.625            | 0.812          | 67.76                                           |            | 140          | 219.1                                      | 20.62          | 100.92           |
| 8                                          | 8.625            | 0.875          | 72.42                                           | XXS        |              | 219.1                                      | 22.23          | 107.92           |
| 8                                          | 8.625            | 0.906          | 74.69                                           |            | 160          | 219.1                                      | 23.01          | 111.27           |
| 8                                          | 8.625            | 1              | 81.44                                           |            |              | 219.1                                      | 25.4           | 121.33           |
| 10                                         | 10.75            | 0.25           | 28.04                                           |            | 20           | 273                                        | 6.35           | 41.77            |
| 10                                         | 10.75            | 0.279          | 31.2                                            |            |              | 273                                        | 7.09           | 46.51            |
| 10                                         | 10.75            | 0.307          | 34.24                                           |            | 30           | 273                                        | 7.8            | 51.03            |
| 10                                         | 10.75            | 0.344          | 38.23                                           |            |              | 273                                        | 8.74           | 56.98            |
| 10                                         | 10.75            | 0.365          | 40.48                                           | STD        | 40           | 273                                        | 9.27           | 60.31            |
| 10                                         | 10.75            | 0.438          | 48.24                                           |            |              | 273                                        | 11.13          | 71.9             |
| 10                                         | 10.75            | 0.5            | 54.74                                           | XS         | 60           | 273                                        | 12.7           | 81.55            |
| 10                                         | 10.75            | 0.562          | 61.15                                           |            |              | 273                                        | 14.27          | 91.08            |
| 10                                         | 10.75            | 0.594          | 64.43                                           |            | 80           | 273                                        | 15.09          | 96.01            |
| 10                                         | 10.75            | 0.625          | 67.58                                           |            |              | 273                                        | 15.88          | 100.73           |
| 10                                         | 10.75            | 0.719          | 77.03                                           |            | 100          | 273                                        | 18.26          | 114.75           |

|                                                        |                                                              |                                                             |
|--------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|
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| TRUBKY OCELOVÉ BEZEŠVÉ DODÁVANÉ DLE ZAHRANIČNÍCH NOREM | SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO FOREIGN STANDARDS | NAHTLOSE STAHLROHRE DELIEFERT GEMÄSS INTERNATIONALEN NORMEN |
| Rozměrová norma<br>ANSI/ASME B 36.10M-1985             | Dimensional standard<br>ANSI/ASME B 36.10M-1985              | Massnorm gemäss<br>ANSI/ASME B 36.10M-1985                  |



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| NPS    | Vnější průměr    | Tloušťka stěny | Hmotnost | STD/XS/XXS | Schedule No. | Vnější průměr    | Tloušťka stěny | Hmotnost metrová |
|--------|------------------|----------------|----------|------------|--------------|------------------|----------------|------------------|
| NPS    | Outside diameter | Wall thickness | Weight   | STD/XS/XXS | Schedule No. | Outside diameter | Wall thickness | Weight per meter |
| NPS    | Außendurchmesser | Wanddicke      | Gewicht  | STD/XS/XXS | Schedule No. | Außendurchmesser | Wanddicke      | Metergewicht     |
| (inch) | (inch)           | (inch)         | (lb/ft)  |            |              | (mm)             | (mm)           | (kg/m)           |
| 10     | 10.75            | 0.812          | 86.18    |            |              | 273              | 20.62          | 128.38           |
| 10     | 10.75            | 0.844          | 89.29    |            | 120          | 273              | 21.44          | 133.06           |
| 10     | 10.75            | 0.875          | 92.28    |            |              | 273              | 22.23          | 137.52           |
| 10     | 10.75            | 0.938          | 98.3     |            |              | 273              | 23.83          | 146.48           |
| 10     | 10.75            | 1              | 104.13   | XXS        | 140          | 273              | 25.4           | 155.15           |
| 10     | 10.75            | 1.125          | 115.64   |            | 160          | 273              | 28.58          | 172.33           |
| 10     | 10.75            | 1.25           | 126.83   |            |              | 273              | 31.75          | 188.97           |
| 12     | 12.75            | 0.25           | 33.38    |            | 20           | 323.8            | 6.35           | 49.73            |
| 12     | 12.75            | 0.281          | 37.42    |            |              | 323.8            | 7.14           | 55.77            |
| 12     | 12.75            | 0.312          | 41.45    |            |              | 323.8            | 7.92           | 61.71            |
| 12     | 12.75            | 0.33           | 43.77    |            | 30           | 323.8            | 8.38           | 65.2             |
| 12     | 12.75            | 0.344          | 45.58    |            |              | 323.8            | 8.74           | 67.93            |
| 12     | 12.75            | 0.375          | 49.56    | STD        |              | 323.8            | 9.53           | 73.88            |
| 12     | 12.75            | 0.406          | 53.52    |            | 40           | 323.8            | 10.31          | 79.73            |
| 12     | 12.75            | 0.438          | 57.59    |            |              | 323.8            | 11.13          | 85.84            |
| 12     | 12.75            | 0.5            | 65.42    | XS         |              | 323.8            | 12.7           | 97.46            |
| 12     | 12.75            | 0.562          | 73.15    |            | 60           | 323.8            | 14.27          | 108.96           |
| 12     | 12.75            | 0.625          | 80.93    |            |              | 323.8            | 15.88          | 120.62           |
| 12     | 12.75            | 0.688          | 88.63    |            | 80           | 323.8            | 17.48          | 132.08           |
| 12     | 12.75            | 0.75           | 96.12    |            |              | 323.8            | 19.05          | 143.21           |
| 12     | 12.75            | 0.812          | 103.53   |            |              | 323.8            | 20.62          | 154.21           |
| 12     | 12.75            | 0.844          | 107.32   |            | 100          | 323.8            | 21.44          | 159.91           |
| 12     | 12.75            | 0.875          | 110.97   |            |              | 323.8            | 22.23          | 165.37           |
| 12     | 12.75            | 0.938          | 118.33   |            |              | 323.8            | 23.83          | 176.33           |
| 12     | 12.75            | 1              | 125.49   | XXS        | 120          | 323.8            | 25.4           | 186.97           |
| 12     | 12.75            | 1.062          | 132.57   |            |              | 323.8            | 26.97          | 197.48           |
| 12     | 12.75            | 1.125          | 139.67   |            | 140          | 323.8            | 28.58          | 208.14           |
| 12     | 12.75            | 1.25           | 153.53   |            |              | 323.8            | 31.75          | 228.74           |
| 12     | 12.75            | 1.312          | 160.27   |            | 160          | 323.8            | 33.32          | 238.76           |
| 14     | 14               | 0.344          | 50.17    |            |              | 355.6            | 8.74           | 74.76            |
| 14     | 14               | 0.375          | 54.57    | STD        | 30           | 355.6            | 9.53           | 81.33            |
| 14     | 14               | 0.406          | 58.94    |            |              | 355.6            | 10.31          | 87.79            |
| 14     | 14               | 0.438          | 63.44    |            | 40           | 355.6            | 11.13          | 94.55            |
| 14     | 14               | 0.469          | 67.78    |            |              | 355.6            | 11.91          | 100.94           |
| 14     | 14               | 0.5            | 72.09    | XS         |              | 355.6            | 12.7           | 107.39           |
| 14     | 14               | 0.562          | 80.66    |            |              | 355.6            | 14.27          | 120.11           |
| 14     | 14               | 0.594          | 85.05    |            | 60           | 355.6            | 15.09          | 126.71           |
| 14     | 14               | 0.625          | 89.28    |            |              | 355.6            | 15.88          | 133.03           |
| 14     | 14               | 0.688          | 97.81    |            |              | 355.6            | 17.48          | 145.75           |
| 14     | 14               | 0.75           | 106.13   |            | 80           | 355.6            | 19.05          | 158.1            |
| 14     | 14               | 0.812          | 114.37   |            |              | 355.6            | 20.62          | 170.33           |
| 14     | 14               | 0.875          | 122.65   |            |              | 355.6            | 22.23          | 182.75           |
| 14     | 14               | 0.938          | 130.85   |            | 100          | 355.6            | 23.83          | 194.96           |
| 14     | 14               | 1              | 138.84   |            |              | 355.6            | 25.4           | 206.83           |
| 14     | 14               | 1.062          | 146.74   |            |              | 355.6            | 26.97          | 218.57           |
| 14     | 14               | 1.094          | 150.79   |            | 120          | 355.6            | 27.79          | 224.65           |
| 14     | 14               | 1.125          | 154.69   |            |              | 355.6            | 28.58          | 230.48           |
| 14     | 14               | 1.25           | 170.21   |            | 140          | 355.6            | 31.75          | 253.56           |
| 14     | 14               | 1.406          | 189.11   |            | 160          | 355.6            | 35.71          | 281.7            |
| 14     | 14               | 2              | 256.32   |            |              | 355.6            | 50.8           | 381.83           |
| 14     | 14               | 2.125          | 269.5    |            |              | 355.6            | 53.98          | 401.5            |
| 14     | 14               | 2.2            | 277.25   |            |              | 355.6            | 55.88          | 413.01           |
| 14     | 14               | 2.5            | 307.05   |            |              | 355.6            | 63.5           | 457.4            |
| 16     | 16               | 0.812          | 131.71   |            |              | 406.4            | 20.62          | 196.16           |
| 16     | 16               | 0.844          | 136.61   |            | 80           | 406.4            | 21.44          | 203.53           |
| 16     | 16               | 0.875          | 141.34   |            |              | 406.4            | 22.23          | 210.6            |
| 16     | 16               | 0.938          | 150.89   |            |              | 406.4            | 23.83          | 224.82           |
| 16     | 16               | 1              | 160.2    |            |              | 406.4            | 25.4           | 238.64           |
| 16     | 16               | 1.031          | 164.82   |            | 100          | 406.4            | 26.19          | 245.56           |
| 16     | 16               | 1.062          | 169.43   |            |              | 406.4            | 26.97          | 252.35           |
| 16     | 16               | 1.125          | 178.72   |            |              | 406.4            | 28.58          | 266.28           |
| 16     | 16               | 1.188          | 187.93   |            |              | 406.4            | 30.18          | 280              |
| 16     | 16               | 1.219          | 192.43   |            | 120          | 406.4            | 30.96          | 286.64           |
| 16     | 16               | 1.25           | 196.91   |            |              | 406.4            | 31.75          | 293.33           |
| 16     | 16               | 1.438          | 223.64   |            | 140          | 406.4            | 36.53          | 333.19           |
| 16     | 16               | 1.594          | 245.25   |            | 160          | 406.4            | 40.49          | 365.35           |

| POZNÁMKA |                                                     | NOTICE |                                                  | VERMERK |                                                                 |
|----------|-----------------------------------------------------|--------|--------------------------------------------------|---------|-----------------------------------------------------------------|
| NPS      | Nominal pipe size<br>(platí pro celé ASTM a API 5L) | NPS    | Nominal pipe size<br>(valid for ASTM and API 5L) | NPS     | Rohrmenngroße (gültig für ganze<br>ASTM und API 5L)             |
| STD      | Standard                                            | STD    | Standard                                         | STD     | Standard                                                        |
| XS       | Extra-strong                                        | XS     | Extra-strong                                     | XS      | Extra-strong                                                    |
| XXS      | Double extra-strong                                 | XXS    | Double extra-strong                              | XXS     | Double extra-strong                                             |
|          | Vyrábíme po dohodě.                                 |        | Special agreement necessary.                     |         | Wir fertigen im begrenzten Umfang und nur<br>nach Vereinbarung. |



|                                                        |                                                              |                                                             |
|--------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|
| OCÉLOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                 | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                      | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM                     |
| TRUBKY OCÉLOVÉ BEZEŠVÉ DODÁVANÉ DLE ZAHRANIČNÍCH NOREM | SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO FOREIGN STANDARDS | NAHTLOSE STAHLROHRE GELIEFERT GEMÄSS INTERNATIONALEN NORMEN |
| Rozměrová norma<br>ANSI/ASME B 36.10M-1985             | Dimensional standard<br>ANSI/ASME B 36.10M-1985              | Massnorm gemäss<br>ANSI/ASME B 36.10M-1985                  |

| DÉLKÝ LINE PIPE |                  |                | LINE PIPE LENGHTS |             |             |             | LEITUNGSROHRELÄNGEN |             |             |       |
|-----------------|------------------|----------------|-------------------|-------------|-------------|-------------|---------------------|-------------|-------------|-------|
|                 |                  |                |                   |             |             |             |                     |             |             |       |
|                 | Vnější průměr    | Tloušťka stěny |                   |             |             |             |                     |             |             |       |
|                 | Outside diameter | Wall thickness |                   |             |             |             |                     |             |             |       |
|                 | Außendurchmesser | Wanddicke      |                   |             |             |             |                     |             |             |       |
|                 | (mm)             | (mm)           | 6,35              | 7,04        | 7,09        | 7,11        | 7,14                | 7,80        | 7,92        | 8,18  |
|                 | (in)             | (inch)         | 0,250             | 0,277       | 0,279       | 0,280       | 0,281               | 0,307       | 0,312       | 0,322 |
| 168,3           | (m)              | 6-7            |                   |             | 5,5-7       |             | 5-7                 | 5-7         |             |       |
|                 | (m)              | 12-14          |                   |             | 11-14       |             | 10-14               | 10-14       |             |       |
| 6,626           | (ft)             | 19,69-22,97    |                   |             | 18,04-22,97 |             | 16,40-22,97         | 16,40-22,97 |             |       |
|                 | (ft)             | 39,37-45,93    |                   |             | 36,09-45,93 |             | 32,81-45,93         | 32,81-45,93 |             |       |
| 219,1           | (m)              | 5-7            | 5-7               |             |             |             |                     | 5-7         | 5-7         |       |
|                 | (m)              | 10-14          | 10-14             |             |             |             |                     | 10-14       | 10-14       |       |
| 8,626           | (ft)             | 16,40-22,97    | 16,40-22,97       |             |             |             |                     | 16,40-22,97 | 16,40-22,97 |       |
|                 | (ft)             | 32,81-45,93    | 32,81-45,93       |             |             |             |                     | 32,81-45,93 | 32,81-45,93 |       |
| 27              | (m)              | 6-7            |                   | 5,5-7       |             |             |                     |             |             |       |
|                 | (m)              | 12,5-14        |                   | 11-14       |             |             |                     |             |             |       |
| 10,748          | (ft)             | 19,69-22,97    |                   | 18,04-22,97 |             |             |                     |             |             |       |
|                 | (ft)             | 41,01-45,93    |                   | 36,09-45,93 |             |             |                     |             |             |       |
| 323,8           | (m)              | N/A            |                   |             |             | 5,5-7       |                     | 5,5-7       |             |       |
|                 | (m)              |                |                   |             |             | 11-14       |                     | 11-14       |             |       |
| 12,748          | (ft)             |                |                   |             |             | 18,04-22,97 |                     | 18,04-22,97 |             |       |
|                 | (ft)             |                |                   |             |             | 36,09-45,93 |                     | 36,09-45,93 |             |       |
| 355,6           | (m)              | N/A            | N/A               | N/A         | N/A         | N/A         | N/A                 | N/A         | N/A         |       |
| 14,000          | (m)              |                |                   |             |             |             |                     |             |             |       |
|                 | (ft)             |                |                   |             |             |             |                     |             |             |       |
| 406,4           | (m)              | N/A            | N/A               | N/A         | N/A         | N/A         | N/A                 | N/A         | N/A         |       |
|                 | (m)              |                |                   |             |             |             |                     |             |             |       |
| 16,000          | (ft)             |                |                   |             |             |             |                     |             |             |       |
|                 | (ft)             |                |                   |             |             |             |                     |             |             |       |

| Vnější průměr    | Tloušťka stěny |             |             |             |             |             |             |             |             |
|------------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Outside diameter | Wall thickness |             |             |             |             |             |             |             |             |
| Außendurchmesser | Wanddicke      |             |             |             |             |             |             |             |             |
| (mm)             | (mm)           | 8,38        | 8,74        | 9,27        | 9,53        | 10,31       | 10,97       | 11,13       | 11,91       |
| (in)             | (inch)         | 0,330       | 0,344       | 0,365       | 0,375       | 0,406       | 0,432       | 0,438       | 0,469       |
| 168,3            | (m)            |             | 5-7         |             | 4-7         |             | 4-7         |             |             |
|                  | (m)            |             | 10-14       |             | 8-14        |             | 8-14        |             |             |
| 6,626            | (ft)           |             | 16,40-22,97 |             | 13,12-22,97 |             | 13,12-22,97 |             |             |
|                  | (ft)           |             | 32,81-45,93 |             | 26,25-45,93 |             | 26,25-45,93 |             |             |
| 219,1            | (m)            |             | 4,8-7       |             | 4,2-7       | 4,2-7       |             | 4-7         |             |
|                  | (m)            |             | 9,7-14      |             | 8,5-14      | 8,5-14      |             | 8-14        |             |
| 8,626            | (ft)           |             | 15,75-22,97 |             | 13,78-22,97 | 13,78-22,97 |             | 13,12-22,97 |             |
|                  | (ft)           |             | 31,82-45,93 |             | 27,89-45,93 | 27,89-45,93 |             | 26,25-45,93 |             |
| 27               | (m)            |             | 4,3-7       | 4,3-7       |             |             |             | 4-7         |             |
|                  | (m)            |             | 9,7-14      | 9,7-14      |             |             |             | 8-14        |             |
| 10,748           | (ft)           |             | 14,11-22,97 | 14,11-22,97 |             |             |             | 13,12-22,97 |             |
|                  | (ft)           |             | 31,82-45,93 | 31,82-45,93 |             |             |             | 26,25-45,93 |             |
| 323,8            | (m)            | 5,5-7       | 5,5-7       |             | 5,5-7       | 5,5-7       |             | 5-7         |             |
|                  | (m)            | 11-14       | 11-14       |             | 11-14       | 11-14       |             | 10-14       |             |
| 12,748           | (ft)           | 18,04-22,97 | 18,04-22,97 |             | 18,04-22,97 | 18,04-22,97 |             | 16,40-22,97 |             |
|                  | (ft)           | 36,09-45,93 | 36,09-45,93 |             | 36,09-45,93 | 36,09-45,93 |             | 32,81-45,93 |             |
| 355,6            | (m)            | N/A         | 5,5-6,5     |             | 5,2-6,5     | 5,2-6,5     |             | 5-6         | 4,2-6,5     |
|                  | (m)            |             | 11-13       |             | 10,5-13     | 10,5-13     |             | 10-12,5     | 6-13,5      |
| 14,000           | (ft)           | N/A         | 18,04-21,33 |             | 17,06-21,33 | 17,06-21,33 |             | 16,40-19,69 | 13,78-21,33 |
|                  | (ft)           |             | 36,09-42,65 |             | 34,45-42,65 | 34,45-42,65 |             | 32,81-41,01 | 19,69-44,29 |
| 406,4            | (m)            | N/A         | N/A         | N/A         | N/A         | N/A         | N/A         | N/A         | N/A         |
|                  | (m)            |             |             |             |             |             |             |             |             |
| 16,000           | (ft)           | N/A         | N/A         | N/A         | N/A         | N/A         | N/A         | N/A         | N/A         |
|                  | (ft)           |             |             |             |             |             |             |             |             |

|        | Vnější průměr    | Tloušťka stěny |             |             |             |             |             |             |       |             |
|--------|------------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------|-------------|
|        | Outside diameter | Wall thickness |             |             |             |             |             |             |       |             |
|        | Außendurchmesser | Wanddicke      |             |             |             |             |             |             |       |             |
|        | (mm)             | (mm)           | 21,44       | 21,95       | 22,23       | 23,01       | 23,83       | 25,40       | 26,19 | 26,97       |
|        | (in)             | (inch)         | 0,844       | 0,864       | 0,875       | 0,906       | 0,938       | 1,000       | 1,031 | 1,062       |
| 168,3  | (m)              |                |             |             |             |             |             |             |       |             |
|        | (m)              |                | 4,3-9,5     | 4,3-9,4     |             |             |             |             |       |             |
| 6,626  | (ft)             |                |             |             |             |             |             |             |       |             |
|        | (ft)             |                | 14,11-31,17 | 14,11-30,84 |             |             |             |             |       |             |
| 219,1  | (m)              |                |             |             |             |             |             |             |       |             |
|        | (m)              |                |             | 4-8,7       | 4-8,5       |             | 4-7,4       |             |       |             |
| 8,626  | (ft)             |                |             |             |             |             |             |             |       |             |
|        | (ft)             |                |             | 13,12-28,54 | 13,12-27,89 |             | 13,12-24,28 |             |       |             |
| 273    | (m)              |                |             |             |             |             |             |             |       |             |
|        | (m)              | 4-10           |             | 4-9,7       |             | 4-8,5       | 4-8,5       |             |       |             |
| 10,748 | (ft)             |                |             |             |             |             |             |             |       |             |
|        | (ft)             | 13,12-32,81    |             | 13,12-31,82 |             | 13,12-27,89 | 13,12-27,89 |             |       |             |
| 323,8  | (m)              |                |             |             |             |             |             |             |       |             |
|        | (m)              | 5,3-9,5        |             | 5,3-9,3     |             | 4,5-9       | 4,5-8,6     |             |       | 4-8,3       |
| 12,748 | (ft)             |                |             |             |             |             |             |             |       |             |
|        | (ft)             | 17,39-31,17    |             | 17,39-30,51 |             | 14,76-29,53 | 14,76-28,22 |             |       | 13,12-27,23 |
| 355,6  | (m)              |                |             |             |             |             |             |             |       |             |
|        | (m)              |                |             | 5,2-9       |             | 4,5-8,2     | 4,5-8,2     |             |       | 4-8         |
| 14,000 | (ft)             |                |             |             |             |             |             |             |       |             |
|        | (ft)             |                |             | 17,06-29,53 |             | 14,76-26,90 | 14,76-26,90 |             |       | 13,12-26,25 |
| 406,4  | (m)              |                |             |             |             |             |             |             |       |             |
|        | (m)              | 4-8,5          |             | 4-8,5       |             | 4-8         | 4-8         | 4-7,5       |       | 4-7,2       |
| 16,000 | (ft)             |                |             |             |             |             |             |             |       |             |
|        | (ft)             | 13.12-27.89    |             | 13.12-27.89 |             | 13.12-26.25 | 13.12-26.25 | 13.12-24.61 |       | 13.12-23.62 |



|                                                        |                                                              |                                                             |
|--------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|
| OCÉLOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                 | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                      | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM                     |
| TRUBKY OCÉLOVÉ BEZEŠVÉ DODÁVANÉ DLE ZAHRANIČNÍCH NOREM | SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO FOREIGN STANDARDS | NAHTLOSE STAHLROHRE GELIEFERT GEMÄSS INTERNATIONALEN NORMEN |
| Rozměrová norma<br>ANSI/ASME B 36.10M-1985             | Dimensional standard<br>ANSI/ASME B 36.10M-1985              | Massnorm gemäss<br>ANSI/ASME B 36.10M-1985                  |

| Vnější průměr    | Tloušťka stěny |             |             |             |             |             |             |             |             |
|------------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Outside diameter | Wall thickness |             |             |             |             |             |             |             |             |
| Außendurchmesser | Wanddicke      |             |             |             |             |             |             |             |             |
| (mm)             | (mm)           | 27,79       | 28,58       | 30,18       | 30,96       | 31,75       | 33,32       | 35,71       | 36,53       |
| (in)             | (inch)         | 1,094       | 1,125       | 1,188       | 1,219       | 1,250       | 1,312       | 1,406       | 1,438       |
| 168,3            | (m)            |             |             |             |             |             |             |             | N/A         |
|                  | (m)            |             |             |             |             |             |             |             |             |
| 6,626            | (ft)           |             |             |             |             |             |             |             |             |
|                  | (ft)           |             |             |             |             |             |             |             |             |
| 219,1            | (m)            |             |             |             |             |             |             |             |             |
|                  | (m)            |             |             |             |             |             |             |             |             |
| 8,626            | (ft)           |             |             |             |             |             |             |             |             |
|                  | (ft)           |             |             |             |             |             |             |             |             |
| 273              | (m)            |             |             |             |             |             |             |             |             |
|                  | (m)            |             | 4-8,2       |             |             | 4-7,7       |             |             |             |
| 10,748           | (ft)           |             |             |             |             |             |             |             |             |
|                  | (ft)           |             | 13,12-26,90 |             |             | 13,12-25,26 |             |             |             |
| 323,8            | (m)            |             |             |             |             |             |             |             |             |
|                  | (m)            |             | 4-8         |             |             | 4-7,4       | 4-7,2       |             |             |
| 12,748           | (ft)           |             |             |             |             |             |             |             |             |
|                  | (ft)           |             | 13,12-26,25 |             |             | 13,12-24,28 | 13,12-23,62 |             |             |
| 355,6            | (m)            |             |             |             |             |             |             |             |             |
|                  | (m)            | 4-8         | 4-7,8       |             |             | 4-7,3       |             | 4-6,2       |             |
| 14,000           | (ft)           |             |             |             |             |             |             |             |             |
|                  | (ft)           | 13,12-26,25 | 13,12-25,59 |             |             | 13,12-23,95 |             | 13,12-20,34 |             |
| 406,4            | (m)            |             |             |             |             |             |             |             |             |
|                  | (m)            |             | 4-7,2       | 4-6,8       | 4-6,4       | 4-6         |             |             | 4-5,4       |
| 16,000           | (ft)           |             |             |             |             |             |             |             |             |
|                  | (ft)           |             | 13,12-23,62 | 13,12-22,31 | 13,12-21,00 | 13,12-19,69 |             |             | 13,12-17,72 |

|                                                         |                                                              |                                                             |                                                                                    |
|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                  | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                      | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM                     |  |
| TRUBKY OCELOVÉ BEZEŠVÉ DODÁVANÉ DLE ZAHRA NIČNÍCH NOREM | SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO FOREIGN STANDARDS | NAHTLOSE STAHLROHRE GELIEFERT GEMÄSS INTERNATIONALEN NORMEN |                                                                                    |
| Rozměrová norma<br>ANSI/ASME B 36.10M-1985              | Dimensional standard<br>ANSI/ASME B 36.10M-1985              | Massnorm gemäss<br>ANSI/ASME B 36.10M-1985                  |                                                                                    |

| Vnější průměr    | Tloušťka stěny |             |             |             |             |             |  |  |  |
|------------------|----------------|-------------|-------------|-------------|-------------|-------------|--|--|--|
| Outside diameter | Wall thickness |             |             |             |             |             |  |  |  |
| Außendurchmesser | Wanddicke      |             |             |             |             |             |  |  |  |
| (mm)             | (mm)           | 40,49       | 50,80       | 53,98       | 55,88       | 63,50       |  |  |  |
| (in)             | (inch)         | 1,594       | 2,000       | 2,125       | 2,20        | 2,500       |  |  |  |
| 168,3            | (m)            | N/A         | N/A         | N/A         | N/A         | N/A         |  |  |  |
| 6,626            | (ft)           |             |             |             |             |             |  |  |  |
| 219,1            | (m)            | N/A         | N/A         | N/A         | N/A         | N/A         |  |  |  |
| 8,626            | (m)            |             |             |             |             |             |  |  |  |
|                  | (ft)           |             |             |             |             |             |  |  |  |
| 273              | (m)            |             |             |             |             |             |  |  |  |
| 10,748           | (ft)           |             |             |             |             |             |  |  |  |
| 323,8            | (m)            |             |             |             |             |             |  |  |  |
| 12,748           | (ft)           |             |             |             |             |             |  |  |  |
| 355,6            | (m)            |             | 4-4,5       | 4-4,5       | 4-4,5       | 3,5-4,2     |  |  |  |
| 14,000           | (ft)           |             |             |             |             |             |  |  |  |
| 406,4            | (m)            |             | 13,12-14,76 | 13,12-14,76 | 13,12-14,76 | 11,48-13,78 |  |  |  |
|                  | (ft)           |             |             |             |             |             |  |  |  |
| 16,000           | (ft)           | 13,12-16,40 |             |             |             |             |  |  |  |



|                                                                      |                                                                             |                                                                          |
|----------------------------------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------|
| CELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                                | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                                     | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM                                  |
| TRUBKY CELOVÉ BEZEŠVÉ DODÁVANÉ DLE ZAHRANIČNÍCH NOREM / DÉLKY TRUBEK | SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO FOREIGN STANDARDS / TUBE LENGTHS | NAHTLOSE STAHLROHRE GELIEFERT GEMÄSS INTERNATIONALEN NORMEN / ROHRLÄNGEN |
| Rozměrová norma DIN 2448/81                                          | Dimensional Standard DIN 2448/81                                            | Massnorm gemäss DIN 2448/81                                              |

| ROZMĚROVÁ NORMA DIN 2448/81 |      |                     |      |      |      |      |      |      |      | DIMENSIONAL STANDARD DIN 2448/81 |      |      |      |      |      |      |     |     |     | MASSNORM GEMÄSS DIN 2448/81 |     |     |  |  |  |  |  |  |  |
|-----------------------------|------|---------------------|------|------|------|------|------|------|------|----------------------------------|------|------|------|------|------|------|-----|-----|-----|-----------------------------|-----|-----|--|--|--|--|--|--|--|
|                             |      |                     |      |      |      |      |      |      |      |                                  |      |      |      |      |      |      |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| Vnější průměr               |      | Tloušťka stěny (mm) |      |      |      |      |      |      |      |                                  |      |      |      |      |      |      |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| Outside diameter            |      | Wall thickness (mm) |      |      |      |      |      |      |      |                                  |      |      |      |      |      |      |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| Außendurchmesser            |      | Wanddicke (mm)      |      |      |      |      |      |      |      |                                  |      |      |      |      |      |      |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| (mm)                        | 6.3  | 7.1                 | 8    | 8.8  | 10   | 11   | 12.5 | 14.2 | 16   | 17.5                             | 20   | 22.2 | 25   | 28   | 30   | 32   | 36  | 40  | 45  | 50                          | 55  | 60  |  |  |  |  |  |  |  |
| 60.3                        | 8.4  | 9.3                 | 10.3 | 11.2 | 12.4 | 13.4 | 14.7 | 16.1 |      |                                  |      |      |      |      |      |      |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 63.5                        | 8.9  | 9.9                 | 10.9 | 11.9 | 13.2 | 14.2 | 15.7 | 17.3 |      |                                  |      |      |      |      |      |      |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 70                          | 9.9  | 11                  | 12.2 | 13.3 | 14.8 | 16   | 17.7 | 19.5 | 21.3 | 22.7                             |      |      |      |      |      |      |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 73                          | 10.4 | 11.5                | 12.8 | 13.9 | 15.5 | 16.8 | 18.7 | 20.6 | 22.5 | 24                               |      |      |      |      |      |      |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 76.1                        | 10.8 | 12.1                | 13.4 | 14.6 | 16.3 | 17.7 | 19.6 | 21.7 | 23.7 | 25.3                             | 27.7 |      |      |      |      |      |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 82.5                        | 11.8 | 13.2                | 14.7 | 16   | 17.9 | 19.4 | 21.6 | 23.9 | 26.2 | 28.1                             | 30.8 | 33   |      |      |      |      |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 88.9                        | 12.8 | 14.3                | 16   | 17.4 | 19.5 | 21.1 | 23.6 | 26.2 | 28.8 | 30.8                             | 34   | 36.5 | 39.4 |      |      |      |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 101.6                       | 14.8 | 16.5                | 18.5 | 20.1 | 22.6 | 24.6 | 27.5 | 30.6 | 33.8 | 36.3                             | 40.2 | 43.5 | 47.2 |      |      |      |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 108                         | 15.8 | 17.7                | 19.7 | 21.5 | 24.2 | 26.3 | 29.4 | 32.8 | 36.3 | 39.1                             | 43.4 | 47   | 51.2 |      |      |      |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 114.3                       | 16.8 | 18.8                | 21   | 22.9 | 25.7 | 28   | 31.4 | 35.1 | 38.8 | 41.8                             | 46.5 | 50.4 | 55.1 |      |      |      |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 127                         | 18.8 | 21                  | 23.5 | 25.7 | 28.9 | 31.5 | 35.3 | 39.5 | 43.8 | 47.3                             | 52.8 | 57.4 | 62.9 | 68.4 | 71.8 | 75   |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 133                         | 19.7 | 22                  | 24.7 | 27   | 30.3 | 33.1 | 37.1 | 41.6 | 46.2 | 49.8                             | 55.7 | 60.7 | 66.6 | 72.5 | 76.2 | 79.7 |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 139.7                       | 20.7 | 23.2                | 26   | 28.4 | 32   | 34.9 | 39.2 | 43.9 | 48.8 | 52.7                             | 59   | 64.3 | 70.7 | 77.1 | 81.2 | 85   |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 152.4                       | 22.7 | 25.4                | 28.5 | 31.2 | 35.1 | 38.4 | 43.1 | 48.4 | 53.8 | 58.2                             | 65.3 | 71.3 | 78.5 | 85.9 | 90.6 | 95   |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 159                         | 23.7 | 26.6                | 29.8 | 32.6 | 36.7 | 40.1 | 45.2 | 50.7 | 56.4 | 61.1                             | 68.6 | 74.9 | 82.6 | 90.5 | 95.4 | 100  |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 168.3                       | 25.2 | 28.2                | 31.6 | 34.6 | 39   | 42.7 | 48   | 54   | 60.1 | 65.1                             | 73.1 | 80   | 88.3 | 96.9 | 102  | 108  |     |     |     |                             |     |     |  |  |  |  |  |  |  |
| 177.8                       | 26.6 | 29.9                | 33.5 | 36.7 | 41.4 | 45.2 | 51   | 57.3 | 63.8 | 69.2                             | 77.8 | 85.2 | 94.2 | 103  | 109  | 115  | 126 |     |     |                             |     |     |  |  |  |  |  |  |  |
| 193.7                       | 29.1 | 32.7                | 36.6 | 40.1 | 45.3 | 49.6 | 55.9 | 62.9 | 70.1 | 76                               | 85.7 | 93.9 | 104  | 114  | 121  | 128  | 140 | 152 |     |                             |     |     |  |  |  |  |  |  |  |
| 219.1                       | 33.1 | 37.1                | 41.6 | 45.6 | 51.6 | 56.5 | 63.7 | 71.8 | 80.1 | 87                               | 98.2 | 108  | 120  | 132  | 140  | 148  | 163 |     |     |                             |     |     |  |  |  |  |  |  |  |
| 244.5                       | 37   | 41.6                | 46.7 | 51.2 | 57.8 | 63.3 | 71.5 | 80.6 | 90.2 | 98                               | 111  | 122  | 135  | 149  | 159  | 168  | 185 | 202 | 221 |                             |     |     |  |  |  |  |  |  |  |
| 273                         | 41.4 | 46.6                | 52.3 | 57.3 | 64.9 | 71.1 | 80.3 | 90.6 | 101  | 110                              | 125  | 137  | 153  | 169  | 180  | 190  | 210 | 230 | 253 | 275                         |     |     |  |  |  |  |  |  |  |
| 323.9                       |      | 55.5                | 62.3 | 68.4 | 77.4 | 84.9 | 96   | 108  | 121  | 132                              | 150  | 165  | 184  | 204  | 217  | 230  | 256 | 280 | 310 | 338                         | 365 | 390 |  |  |  |  |  |  |  |
| 355.6                       |      |                     |      | 75.3 | 85.2 | 93.5 | 106  | 120  | 134  | 146                              | 166  | 183  | 204  | 226  | 241  | 255  | 284 | 311 | 345 | 377                         | 408 | 437 |  |  |  |  |  |  |  |
| 406.4                       |      |                     |      |      |      |      |      |      |      |                                  | 191  | 210  | 235  | 261  | 278  | 295  | 329 | 361 | 401 |                             |     |     |  |  |  |  |  |  |  |

Vyrábíme v omezeném rozsahu a jen po dohodě.

Special agreement necessary.

Wir fertigen im begrenzten Umfang und nur nach Vereinbarung.

| DÉLKY TRUBEK                                                                                                                                                                                                                | TUBE LENGTHS                                                                                                                                                                                                                                           | ROHRLÄNGEN                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dodáváme trubky ve výrobních a přesných délkách, nebo v násobcích přesných délek s přídavkem na řez dle požadavků zákazníka.<br>Tolerance přesných délek je + 15 mm – 0 mm, přičemž je možno dohodnout přísnější tolerance. | Tubes are supplied in random and exact lengths, or multiple precise lengths with a cutting allowance acc. to standards or customers' requirement.<br>Tolerance of the exact length is + 15 – 0 mm, tougher tolerances are possible based on agreement. | Wir liefern Rohre in Herstellungs- und Fixlängen, oder in Kombilängen mit Schnitzzugabe je nach Forderungen des Kunden.<br>Toleranzen bei Fixlängen sind – 0/ + 15 mm, wobei nach Vereinbarung auch strengere Toleranzen bestätigt werden können. |

|                                               |                                                          |                                             |                                                                                    |
|-----------------------------------------------|----------------------------------------------------------|---------------------------------------------|------------------------------------------------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM        | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                  | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM     |  |
| TRUBKY OCELOVÉ BEZEŠVÉ DODÁVANÉ DLE NOREM ČSN | SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO ČSN STANDARDS | NAHTLOSE STAHLROHRE GELIEFERT GEMÄSS ČSN    |                                                                                    |
| Dovolené mezní úchytky rozměrů                | Permissible Variations on Dimensions                     | Zulässige Grenzabweichungen der Abmessungen |                                                                                    |

| TRUBKY OCELOVÉ BEZEŠVÉ DODÁVANÉ DLE NOREM ČSN |                 |
|-----------------------------------------------|-----------------|
| Technické dodací podmínky                     | Rozměrová norma |
| ČSN 42 025                                    | ČSN 42 5715     |
|                                               | ČSN 42 5716     |
| ČSN 42 0251                                   | ČSN 42 5715     |
|                                               | ČSN 42 5716     |
| ČSN 42 0165                                   | ČSN 42 5715     |
|                                               | ČSN 42 5716     |
| ČSN 42 0252                                   | ČSN 42 5750     |

### DOVOLENÉ MEZNÍ ÚCHYLKY ROZMĚRŮ

(výťah některých hlavních parametrů, nezahrnuje úplné znění normy)

| ČSN 42 5715                    |                                 |                   |
|--------------------------------|---------------------------------|-------------------|
| Mezní úchytky vnějšího průměru |                                 |                   |
| do ø 219 mm                    | ± 1,25 %, nejméně však ± 0,5 mm |                   |
| nad ø 219 mm                   | ± 1,5 %                         |                   |
| Mezní úchytky tloušťky stěny   |                                 |                   |
| do ø 219 mm                    | tloušťky do 20 mm               | + 12,5 % / – 15 % |
|                                | tloušťky nad 20 mm              | ± 12,5 %          |
| nad ø 219 mm                   | všechny tloušťky                | ± 15 %            |

| ČSN 42 5716                    |                              |  |
|--------------------------------|------------------------------|--|
| Mezní úchytky vnějšího průměru |                              |  |
| do ø 219 mm                    | ± 1 %, nejméně však ± 0,5 mm |  |
| nad ø 219 mm                   | ± 1,25 %                     |  |
| Mezní úchytky tloušťky stěny   |                              |  |
| do 20 mm                       | ± 12,5 %                     |  |
| nad 20 mm                      | ± 10 %                       |  |

| ČSN 42 5720                    |                              |  |
|--------------------------------|------------------------------|--|
| Mezní úchytky vnějšího průměru | ± 1 %, nejméně však ± 0,5 mm |  |
| Mezní úchytky tloušťky stěny   | + 15 % / – 10 %              |  |

| ČSN 42 5750 pro trubky z oceli 17 102 |                   |  |
|---------------------------------------|-------------------|--|
| Mezní úchytky vnějšího průměru        |                   |  |
| do ø 133 mm                           | ± 1 %             |  |
| nad ø 133 mm                          | + 1,5 % / – 1,0 % |  |
| Mezní úchytky tloušťky stěny          | ± 15 %            |  |

| ČSN 42 5750 pro trubky z oceli 17 021, 17 041, 17 061, 17 116 a 17 134 |                   |  |
|------------------------------------------------------------------------|-------------------|--|
| Mezní úchytky vnějšího průměru                                         | + 1,5 % / – 1,0 % |  |
| Mezní úchytky tloušťky stěny                                           | ± 15 %            |  |

| VN 42 0256                                                                                                                           |                     |  |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------|--|
| Mezní úchytky vnějšího průměru                                                                                                       |                     |  |
| do ø 114 mm                                                                                                                          | ± 1,25 %            |  |
| nad ø 114 do ø 219 mm                                                                                                                | ± 1,5 %             |  |
| nad ø 219 mm                                                                                                                         | ± 2,0 %             |  |
| Vnější průměr může být podkročen v maximální délce 1 m pod stanovené minusové úchytky, pokud bude dodržena minimální tloušťka stěny, |                     |  |
| Mezní úchytky tloušťky stěny:                                                                                                        |                     |  |
| do 20 mm                                                                                                                             | + 12,5 % / – 15,0 % |  |
| nad 20 mm                                                                                                                            | ± 12,5 %            |  |

| SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO ČSN STANDARDS |                       |
|----------------------------------------------------------|-----------------------|
| Technical delivery conditions                            | Dimensional standards |
| ČSN 42 025                                               | ČSN 42 5715           |
|                                                          | ČSN 42 5716           |
| ČSN 42 0251                                              | ČSN 42 5715           |
|                                                          | ČSN 42 5716           |
| ČSN 42 0165                                              | ČSN 42 5715           |
|                                                          | ČSN 42 5716           |
| ČSN 42 0252                                              | ČSN 42 5750           |

### PERMISSIBLE VARIATIONS ON DIMENSIONS

(extract of some main parameters; it does not include exact wording of the standard)

| ČSN 42 5715                                |                             |                   |
|--------------------------------------------|-----------------------------|-------------------|
| Permissible Variations of Outside diameter |                             |                   |
| up to ø 219 mm                             | ± 1.25 %, but min. ± 0.5 mm |                   |
| over ø 219 mm                              | ± 1.5 %                     |                   |
| Permissible Variations of Wall thickness   |                             |                   |
| up to ø 219 mm                             | t up to 20 mm               | + 12.5 % / – 15 % |
|                                            | t over 20 mm                | ± 12.5 %          |
| over ø 219 mm                              | all Wall thicknesses        | ± 15 %            |

| ČSN 42 5716                                |                          |  |
|--------------------------------------------|--------------------------|--|
| Permissible Variations of Outside diameter |                          |  |
| up to ø 219 mm                             | ± 1 %, but min. ± 0.5 mm |  |
| over ø 219 mm                              | ± 1.25 %                 |  |
| Permissible Variations of Wall thickness   |                          |  |
| up to 20 mm                                | ± 12.5 %                 |  |
| over 20 mm                                 | ± 10 %                   |  |

| ČSN 42 5720                                |                          |  |
|--------------------------------------------|--------------------------|--|
| Permissible Variations of Outside diameter | ± 1 %, but min. ± 0.5 mm |  |
| Permissible Variations of Wall thickness   | + 15 % / – 10 %          |  |

| ČSN 42 5750 FOR TUBES FROM STEEL 17 102    |                   |  |
|--------------------------------------------|-------------------|--|
| Permissible Variations of Outside diameter |                   |  |
| up to ø 133 mm                             | ± 1 %             |  |
| over ø 133 mm                              | + 1.5 % / – 1.0 % |  |
| Permissible Variations of Wall thickness   | ± 15 %            |  |

| ČSN 42 5750 FOR TUBE FROM STEEL 17 021, 17 041, 17 061, 17 116 and 17 134 |                   |  |
|---------------------------------------------------------------------------|-------------------|--|
| Permissible Variations of Outside diameter                                | + 1.5 % / – 1.0 % |  |
| Permissible Variations of Wall thickness                                  | ± 15 %            |  |

| VN 42 0256                                                                                                                                          |                     |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--|
| Permissible Variations of Outside diameter                                                                                                          |                     |  |
| up to ø 114 mm                                                                                                                                      | ± 1.25 %            |  |
| from ø 114 to ø 219 mm                                                                                                                              | ± 1.5 %             |  |
| over ø 219 mm                                                                                                                                       | ± 2.0 %             |  |
| The outside diameter can fall under the set minus permissible variations on the maximum span of 1 m, as long as the minimum wall thickness is kept. |                     |  |
| Permissible Variations of Wall thickness                                                                                                            |                     |  |
| up to 20 mm                                                                                                                                         | + 12.5 % / – 15.0 % |  |
| over 20 mm                                                                                                                                          | ± 12.5 %            |  |

| NAHTLOSE STAHLROHRE GELIEFERT GEMÄSS ČSN |             |
|------------------------------------------|-------------|
| Technische Lieferbedingungen             | Massnorm    |
| ČSN 42 025                               | ČSN 42 5715 |
|                                          | ČSN 42 5716 |
| ČSN 42 0251                              | ČSN 42 5715 |
|                                          | ČSN 42 5716 |
| ČSN 42 0165                              | ČSN 42 5715 |
|                                          | ČSN 42 5716 |
| ČSN 42 0252                              | ČSN 42 5750 |

### ZULÄSSIGE GRENZABWEICHUNGEN DER ABMESSUNGEN

(Auszug von einigen Hauptparametern; kein Ersatz für Norm)

| ČSN 42 5715                                 |                                 |                   |
|---------------------------------------------|---------------------------------|-------------------|
| Grenzabweichungen des Rohraußendurchmessers |                                 |                   |
| bis ø 219 mm                                | ± 1,25 %, aber minimal ± 0,5 mm |                   |
| über ø 219 mm                               | ± 1,5 %                         |                   |
| Grenzabweichungen der Rohrwanddicke         |                                 |                   |
| bis ø 219 mm                                | Wanddicke bis 20 mm             | + 12,5 % / – 15 % |
|                                             | Wanddicke über 20 mm            | ± 12,5 %          |
| über ø 219 mm                               | Alle wanddicke                  | ± 15 %            |

| ČSN 42 5716                                 |                              |  |
|---------------------------------------------|------------------------------|--|
| Grenzabweichungen des Rohraußendurchmessers |                              |  |
| bis ø 219 mm                                | ± 1 %, aber minimal ± 0,5 mm |  |
| über ø 219 mm                               | ± 1,25 %                     |  |
| Grenzabweichungen der Rohrwanddicke         |                              |  |
| bis 20 mm                                   | ± 12,5 %                     |  |
| über 20 mm                                  | ± 10 %                       |  |

| ČSN 42 5720                                 |                              |  |
|---------------------------------------------|------------------------------|--|
| Grenzabweichungen des Rohraußendurchmessers | ± 1 %, aber minimal ± 0,5 mm |  |
| Grenzabweichungen der Rohrwanddicke         | + 15 % / – 10 %              |  |

| ČSN 42 5750 FÜR ROHRE AUS DEM STAHL 17 102  |                   |  |
|---------------------------------------------|-------------------|--|
| Grenzabweichungen des Rohraußendurchmessers |                   |  |
| bis ø 133 mm                                | ± 1 %             |  |
| über ø 133 mm                               | + 1,5 % / – 1,0 % |  |
| Grenzabweichungen der Rohrwanddicke         | ± 15 %            |  |

| ČSN 42 5750 FÜR ROHRE AUS DEM STAHL 17 021, 17 041, 17 061, 17 116 und 17 134 |                   |  |
|-------------------------------------------------------------------------------|-------------------|--|
| Grenzabweichungen des Rohraußendurchmessers                                   | + 1,5 % / – 1,0 % |  |
| Grenzabweichungen der Rohrwanddicke                                           | ± 15 %            |  |

| VN 42 0256                                                                                                                                           |                     |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--|
| Grenzabweichungen des Rohraußendurchmessers                                                                                                          |                     |  |
| bis ø 114 mm                                                                                                                                         | ± 1,25 %            |  |
| über ø 114 bis ø 219 mm                                                                                                                              | ± 1,5 %             |  |
| über ø 219 mm                                                                                                                                        | ± 2,0 %             |  |
| Der Rohraußendurchmesser darf in der Länge maximal 1 m unter den Mindestgrenzabweichungen liegen, solange die Mindestrohrwanddicke eingehalten wird. |                     |  |
| Grenzabweichungen der Rohrwanddicke:                                                                                                                 |                     |  |
| bis 20 mm                                                                                                                                            | + 12,5 % / – 15,0 % |  |
| über 20 mm                                                                                                                                           | ± 12,5 %            |  |



|                                         |                                                          |                                          |
|-----------------------------------------|----------------------------------------------------------|------------------------------------------|
| OCÉLOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM  | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                  | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM  |
| TRUBKY OCÉLOVÉ BEZEŠVÉ DODÁVANÉ DLE ČSN | SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO ČSN STANDARDS | NAHTLOSE STAHLROHRE DELIEFERT GEMÄSS ČSN |
| Rozměrová norma<br>ČSN ISO 4200         | Dimensional Standard<br>ČSN ISO 4200                     | Massnorm gemäss<br>ČSN ISO 4200          |

| ROZMĚROVÁ NORMA ČSN ISO 4200                                                                                                                          |      |      |      |      |      |      |      |      |      | DIMENSIONAL STANDARD ČSN ISO 4200                                                                                                                                                                         |      |      |      |      |      |      |      |      |      | MASSNORM GEMÄSS ČSN ISO 4200                                                                                                                              |     |     |     |     |     |  |  |  |                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|--|--|--|-----------------------------------------------|
| Vnější průměr                                                                                                                                         |      |      |      |      |      |      |      |      |      | Tloušťka stěny (mm)                                                                                                                                                                                       |      |      |      |      |      |      |      |      |      |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| Outside diameter                                                                                                                                      |      |      |      |      |      |      |      |      |      | Wall thickness (mm)                                                                                                                                                                                       |      |      |      |      |      |      |      |      |      |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| Außendurchmesser                                                                                                                                      |      |      |      |      |      |      |      |      |      | Wanddicke (mm)                                                                                                                                                                                            |      |      |      |      |      |      |      |      |      |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| (mm)                                                                                                                                                  | 4.5  | 5    | 5.6  | 6.3  | 7.1  | 8    | 8.8  | 10   | 11   | 12.5                                                                                                                                                                                                      | 14.2 | 16   | 17.5 | 20   | 22.2 | 25   | 28   | 30   | 32   | 36                                                                                                                                                        | 40  | 45  | 50  | 55  | 60  |  |  |  | hmotnost kg/m<br>weight kg /m<br>Gewicht kg/m |
| 60.3                                                                                                                                                  |      |      |      | 8.39 | 9.32 | 10.3 | 11.2 | 12.4 | 13.4 | 14.7                                                                                                                                                                                                      | 16.1 |      |      |      |      |      |      |      |      |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 63.5                                                                                                                                                  |      |      |      | 8.89 | 9.88 | 11.0 | 11.9 | 13.2 | 14.2 | 15.7                                                                                                                                                                                                      | 17.3 |      |      |      |      |      |      |      |      |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 70                                                                                                                                                    |      |      |      | 9.90 | 11.0 | 12.2 | 13.3 | 14.8 | 16.0 | 17.7                                                                                                                                                                                                      | 19.5 | 21.3 | 22.7 |      |      |      |      |      |      |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 73.0                                                                                                                                                  |      |      |      | 10.4 | 11.5 | 12.8 | 13.9 | 15.5 | 16.8 | 18.7                                                                                                                                                                                                      | 20.6 | 22.5 | 24.0 |      |      |      |      |      |      |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 76.1                                                                                                                                                  |      | 8.77 | 9.74 | 10.8 | 12.1 | 13.4 | 14.6 | 16.3 | 17.7 | 19.6                                                                                                                                                                                                      | 21.7 | 23.7 | 25.3 | 27.7 |      |      |      |      |      |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 82.5                                                                                                                                                  |      | 9.56 | 10.6 | 11.8 | 13.2 | 14.7 | 16.0 | 17.9 | 19.4 | 21.6                                                                                                                                                                                                      | 23.9 | 26.2 | 28.1 | 30.8 | 33.0 |      |      |      |      |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 88.9                                                                                                                                                  | 9.37 | 10.3 | 11.5 | 12.8 | 14.3 | 16.0 | 17.4 | 19.5 | 21.1 | 23.6                                                                                                                                                                                                      | 26.2 | 28.8 | 30.8 | 34.0 | 36.5 | 39.4 |      |      |      |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 101.5                                                                                                                                                 | 10.8 | 11.9 | 13.2 | 14.8 | 16.5 | 18.4 | 20.1 | 22.6 | 24.6 | 27.4                                                                                                                                                                                                      | 30.6 | 33.7 | 36.3 | 40.2 | 43.4 | 47.2 |      |      |      |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 108                                                                                                                                                   | 11.5 | 12.7 | 14.1 | 15.8 | 17.7 | 19.7 | 21.5 | 24.2 | 26.3 | 29.4                                                                                                                                                                                                      | 32.8 | 36.3 | 39.1 | 43.4 | 47.0 | 51.2 |      |      |      |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 114.3                                                                                                                                                 | 12.2 | 13.5 | 15.0 | 16.8 | 18.8 | 21.0 | 22.9 | 25.7 | 28.0 | 31.4                                                                                                                                                                                                      | 35.1 | 38.8 | 41.8 | 46.5 | 50.4 | 55.1 |      |      |      |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 127                                                                                                                                                   | 13.6 | 15.0 | 16.8 | 18.8 | 21.0 | 23.5 | 25.7 | 28.9 | 31.5 | 35.3                                                                                                                                                                                                      | 39.5 | 43.8 | 47.3 | 52.8 | 57.4 | 62.9 | 68.4 | 71.8 | 75.0 |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 133                                                                                                                                                   | 14.3 | 15.8 | 17.6 | 19.7 | 22.1 | 24.7 | 27.0 | 30.3 | 33.1 | 37.1                                                                                                                                                                                                      | 41.6 | 46.2 | 49.8 | 55.7 | 60.7 | 66.6 | 72.5 | 76.2 | 79.7 |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 139.7                                                                                                                                                 |      |      |      | 20.7 | 23.2 | 26.0 | 28.4 | 32.0 | 34.9 | 39.2                                                                                                                                                                                                      | 44.0 | 48.8 | 52.7 | 59.0 | 64.3 | 70.7 | 77.1 | 81.2 | 85.0 |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 141.3                                                                                                                                                 |      |      |      | 21.0 | 23.5 | 26.3 | 28.8 | 32.4 | 35.3 | 39.7                                                                                                                                                                                                      | 44.5 | 49.4 | 53.4 | 59.8 | 65.2 | 71.7 | 78.2 | 82.3 | 86.3 |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 152.4                                                                                                                                                 |      |      |      | 22.7 | 25.4 | 28.5 | 31.2 | 35.1 | 38.4 | 43.1                                                                                                                                                                                                      | 48.4 | 53.8 | 58.2 | 65.3 | 71.3 | 78.5 | 85.9 | 90.6 | 95.0 |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 159                                                                                                                                                   |      |      |      | 23.7 | 26.6 | 29.8 | 32.6 | 36.7 | 40.1 | 45.2                                                                                                                                                                                                      | 50.7 | 56.4 | 61.1 | 68.6 | 74.9 | 82.6 | 90.5 | 95.4 | 100  |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 168.3                                                                                                                                                 |      |      |      | 25.2 | 28.2 | 31.6 | 34.6 | 39.0 | 42.7 | 48.0                                                                                                                                                                                                      | 54.0 | 60.1 | 65.1 | 73.1 | 80.0 | 88.4 | 96.9 | 102  | 108  |                                                                                                                                                           |     |     |     |     |     |  |  |  |                                               |
| 177.8                                                                                                                                                 |      |      |      | 26.6 | 29.9 | 33.5 | 36.7 | 41.4 | 45.2 | 51.0                                                                                                                                                                                                      | 57.3 | 63.8 | 69.2 | 77.8 | 85.2 | 94.2 | 103  | 109  | 115  | 126                                                                                                                                                       |     |     |     |     |     |  |  |  |                                               |
| 193.7                                                                                                                                                 |      |      |      | 29.1 | 32.7 | 36.6 | 40.1 | 45.3 | 49.6 | 55.9                                                                                                                                                                                                      | 62.9 | 70.1 | 76.0 | 85.7 | 93.9 | 104  | 114  | 121  | 128  | 140                                                                                                                                                       | 152 |     |     |     |     |  |  |  |                                               |
| 219.1                                                                                                                                                 |      |      |      | 33.1 | 37.1 | 41.6 | 45.6 | 51.6 | 56.5 | 63.7                                                                                                                                                                                                      | 71.8 | 80.1 | 87.0 | 98.2 | 108  | 120  | 132  | 140  | 148  | 163                                                                                                                                                       |     |     |     |     |     |  |  |  |                                               |
| 244.5                                                                                                                                                 |      |      |      | 37.0 | 41.6 | 46.7 | 51.2 | 57.8 | 63.3 | 71.5                                                                                                                                                                                                      | 80.7 | 90.2 | 98.0 | 111  | 122  | 135  | 150  | 159  | 168  | 185                                                                                                                                                       | 202 | 221 | 240 |     |     |  |  |  |                                               |
| 273                                                                                                                                                   |      |      |      | 41.4 | 46.5 | 52.2 | 57.2 | 64.7 | 70.9 | 80.2                                                                                                                                                                                                      | 90.5 | 101  | 110  | 125  | 137  | 153  | 169  | 179  | 190  | 210                                                                                                                                                       | 229 | 253 | 275 |     |     |  |  |  |                                               |
| 323.9                                                                                                                                                 |      |      |      |      | 55.5 | 62.3 | 68.4 | 77.4 | 84.9 | 96.0                                                                                                                                                                                                      | 109  | 122  | 132  | 150  | 165  | 184  | 204  | 217  | 230  | 256                                                                                                                                                       | 280 | 310 | 338 |     |     |  |  |  |                                               |
| 355.6                                                                                                                                                 |      |      |      |      |      |      | 75.3 | 85.2 | 93.5 | 106                                                                                                                                                                                                       | 120  | 134  | 146  | 166  | 183  | 204  | 226  | 241  | 255  | 284                                                                                                                                                       | 311 | 345 | 377 | 408 | 437 |  |  |  |                                               |
| 406.4                                                                                                                                                 |      |      |      |      |      |      |      |      |      |                                                                                                                                                                                                           |      |      |      |      | 191  | 210  | 235  | 261  | 279  | 296                                                                                                                                                       | 329 | 361 | 401 |     |     |  |  |  |                                               |
| POZNÁMKA                                                                                                                                              |      |      |      |      |      |      |      |      |      | NOTICE                                                                                                                                                                                                    |      |      |      |      |      |      |      |      |      | VERMERK                                                                                                                                                   |     |     |     |     |     |  |  |  |                                               |
| Trubky s tloušťkou stěny do 9,0 mm včetně a trubky vnějšího průměru 406,4 mm se vyrábějí jen z oceli konstrukční dle ČSN. Jiné oceli pouze po dohodě. |      |      |      |      |      |      |      |      |      | Tubes with wall thickness up to 9,0 mm inclusive and pipes with outside diameter of 406,4 mm are produced only in construction steel according to ČSN. Other steel grades after a special agreement only. |      |      |      |      |      |      |      |      |      | Rohre mit Wanddicke bis 9,0 mm inbegriffen und Rohre mit Aussendurchmesser 406,4 mm werden ausschliesslich aus Konstruktionsstahl gemäss ČSN hergestellt. |     |     |     |     |     |  |  |  |                                               |
| Vyrábíme v omezeném rozsahu a jen po dohodě.                                                                                                          |      |      |      |      |      |      |      |      |      | Special agreement necessary.                                                                                                                                                                              |      |      |      |      |      |      |      |      |      | Wir fertigen im begrenzten Umfang und nur nach Vereinbarung.                                                                                              |     |     |     |     |     |  |  |  |                                               |

|                                         |                                                          |                                          |
|-----------------------------------------|----------------------------------------------------------|------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM  | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                  | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM  |
| TRUBKY OCELOVÉ BEZEŠVÉ DODÁVANÉ DLE ČSN | SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO ČSN STANDARDS | NAHTLOSE STAHLROHRE GELIEFERT GEMÄSS ČSN |
| Rozměrová norma<br>ČSN 42 5715, 42 5716 | Dimensional Standard<br>ČSN 42 5715, 42 5716             | Massnorm gemäss<br>ČSN 42 5715, 42 5716  |



| ROZMĚROVÁ NORMA<br>ČSN 42 5715, 42 5716                                 | DIMENSIONAL STANDARD<br>ČSN 42 5715, 42 5716                                | MASSNORM GEMÄSS<br>ČSN 42 5715, 42 5716                                    |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------|
| technické dodací podmínky:<br>ČSN 42 0250, 42 0251, 42 0165, VN 42 0249 | Technical delivery conditions:<br>ČSN 42 0250, 42 0251, 42 0165, VN 42 0249 | Technische Lieferbedingungen:<br>ČSN 42 0250, 42 0251, 42 0165, VN 42 0249 |

| Vnější průměr    | Tloušťka stěny (mm) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                               |      |     |     |
|------------------|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------------------------------------|------|-----|-----|
| Outside diameter | Wall thickness (mm) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                               |      |     |     |
| Außendurchmesser | Wanddicke (mm)      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                                               |      |     |     |
| ( mm )           | 4.5                 | 5    | 5.6  | 6.3  | 7    | 8    | 9    | 10   | 11   | 12.5 | 14   | 16   | 18   | 20   | 22   | 25                                            | 28   | 32  | 36  |
| 60.3             |                     |      |      | 8.39 | 9.20 | 10.3 | 11.4 | 12.4 | 13.4 | 14.7 |      |      |      |      |      |                                               |      |     |     |
| 63.5             |                     |      |      | 8.89 | 9.75 | 11.0 | 12.1 | 13.2 | 14.2 | 15.7 |      |      |      |      |      | hmotnost kg/m<br>weight kg /m<br>Gewicht kg/m |      |     |     |
| 70               |                     | 8.02 | 8.89 | 9.90 | 10.9 | 12.2 | 13.5 | 14.8 | 16.0 | 17.7 |      |      |      |      |      |                                               |      |     |     |
| 76               |                     | 8.75 | 9.72 | 10.8 | 11.9 | 13.4 | 14.9 | 16.3 | 17.6 | 19.6 | 21.4 |      |      |      |      |                                               |      |     |     |
| 82.5             |                     | 9.56 | 10.6 | 11.8 | 13.0 | 14.7 | 16.3 | 17.9 | 19.4 | 21.6 | 23.7 |      |      |      |      |                                               |      |     |     |
| 89               | 9.38                | 10.4 | 11.5 | 12.8 | 14.2 | 16.0 | 17.8 | 19.5 | 21.2 | 23.6 | 25.9 | 28.8 |      |      |      |                                               |      |     |     |
| 102              | 10.8                | 12.0 | 13.3 | 14.9 | 16.4 | 18.5 | 20.6 | 22.7 | 24.7 | 27.6 | 30.4 | 33.9 | 37.3 |      |      |                                               |      |     |     |
| 108              | 11.5                | 12.7 | 14.1 | 15.8 | 17.4 | 19.7 | 22.0 | 24.2 | 26.3 | 29.4 | 32.5 | 36.3 | 40.0 | 43.4 |      |                                               |      |     |     |
| 114              | 12.2                | 13.4 | 15.0 | 16.7 | 18.5 | 20.9 | 23.3 | 25.6 | 27.9 | 31.3 | 34.5 | 38.7 | 42.6 | 46.4 |      |                                               |      |     |     |
| 127              | 13.6                | 15.0 | 16.8 | 18.8 | 20.7 | 23.5 | 26.2 | 28.9 | 31.5 | 35.3 | 39.0 | 43.8 | 48.4 | 52.8 | 57.0 |                                               |      |     |     |
| 133              | 14.3                | 15.8 | 17.6 | 19.7 | 21.8 | 24.7 | 27.5 | 30.3 | 33.1 | 37.1 | 41.1 | 46.2 | 51.1 | 55.7 | 60.2 | 66.6                                          |      |     |     |
| 140              |                     |      |      | 20.8 | 23.0 | 26.0 | 29.1 | 32.1 | 35.0 | 39.3 | 43.5 | 48.9 | 54.2 | 59.2 | 64.0 | 70.9                                          |      |     |     |
| 152              |                     |      |      | 22.6 | 25.0 | 28.4 | 31.7 | 35.0 | 38.3 | 43.0 | 47.6 | 53.7 | 59.5 | 65.1 | 70.5 | 78.3                                          |      |     |     |
| 159              |                     |      |      | 23.7 | 26.2 | 29.8 | 33.3 | 36.7 | 40.1 | 45.2 | 50.1 | 56.4 | 62.6 | 68.6 | 74.3 | 82.6                                          | 90.5 |     |     |
| 168              |                     |      |      | 25.1 | 27.8 | 31.6 | 35.3 | 39.0 | 42.6 | 47.9 | 53.2 | 60.0 | 66.6 | 73.0 | 79.2 | 88.2                                          | 96.7 |     |     |
| 178              |                     |      |      | 26.7 | 29.5 | 33.5 | 37.5 | 41.4 | 45.3 | 51.0 | 56.6 | 63.9 | 71.0 | 77.9 | 84.6 | 94.3                                          | 104  |     |     |
| 194              |                     |      |      | 29.2 | 32.3 | 36.7 | 41.1 | 45.4 | 49.6 | 56.0 | 62.1 | 70.2 | 78.1 | 85.8 | 93.3 | 104                                           | 115  | 128 |     |
| 219              |                     |      |      | 33.1 | 36.6 | 41.6 | 46.6 | 51.5 | 56.4 | 63.7 | 70.8 | 80.1 | 89.2 | 98.2 | 107  | 120                                           | 132  | 148 |     |
| 245              |                     |      |      | 37.1 | 41.1 | 46.8 | 52.4 | 58.0 | 63.5 | 71.7 | 79.8 | 90.4 | 101  | 111  | 121  | 136                                           | 150  | 168 | 186 |
| 273              |                     |      |      | 41.4 | 45.9 | 52.3 | 58.6 | 64.9 | 71.1 | 80.3 | 89.4 | 101  | 113  | 125  | 136  | 153                                           | 169  | 190 | 210 |
| 324              |                     |      |      |      | 54.7 | 62.3 | 69.9 | 77.4 | 84.9 | 96.0 | 107  | 122  | 136  | 150  | 164  | 184                                           | 204  | 230 | 256 |
| 356              |                     |      |      |      |      |      | 76.9 | 85.2 | 93.4 | 106  | 118  | 134  | 150  | 165  | 181  | 204                                           | 226  | 255 | 284 |
| 377              |                     |      |      |      |      |      |      | 90.5 | 99.3 | 112  | 125  | 142  | 159  | 176  | 193  | 217                                           | 241  | 272 | 303 |
| 406              |                     |      |      |      |      |      |      |      |      |      |      |      |      | 190  | 208  | 235                                           | 261  | 295 | 329 |

| POZNÁMKA                                                                                                                                              | NOTICE                                                                                                                                                                                                    | VERMERK                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Trubky s tloušťkou stěny do 9,0 mm včetně a trubky vnějšího průměru 406,4 mm se vyrábějí jen z oceli konstrukční dle ČSN. Jiné oceli pouze po dohodě. | Tubes with wall thickness up to 9,0 mm inclusive and pipes with outside diameter of 406,4 mm are produced only in construction steel according to ČSN. Other steel grades after a special agreement only. | Rohre mit Wanddicke bis 9,0 mm inbegriffen und Rohre mit Aussendurchmesser 406,4 mm werden ausschliesslich aus Konstruktionsstahl gemäß ČSN hergestellt. |
| Vyrábíme v omezeném rozsahu a jen po dohodě.                                                                                                          | Special agreement necessary.                                                                                                                                                                              | Wir fertigen im begrenzten Umfang und nur nach Vereinbarung.                                                                                             |



|                                                     |                                                          |                                              |
|-----------------------------------------------------|----------------------------------------------------------|----------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM              | SEAMLESS STEEL TUBES PRODUCTION PROGRAM                  | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM      |
| TRUBKY OCELOVÉ BEZEŠVÉ DODÁVANÉ DLE ČSN             | SEAMLESS STEEL TUBES SUPPLIED ACCORDING TO ČSN STANDARDS | NAHTLOSE STAHLROHRE GELIEFERT GEMÄSS ČSN     |
| Trubky ocelové bezešvé silnostěnné tvářené za tepla | Hot rolled heavy wall thickness seamless steel pipes     | Nahtlose warmgewalzte dickwandige Stahlrohre |

| TRUBKY OCELOVÉ BEZEŠVÉ<br>SILNOSTĚNNÉ TVÁŘENÉ ZA TEPLA |                     |      |      | HOT ROLLED HEAVY WALL THICKNESS<br>SEAMLESS STEEL PIPES |      |      |      |       | NAHTLOSE WARMGEWALZTE<br>DICKWANDIGE STAHLROHRE |     |               |     |     |     |
|--------------------------------------------------------|---------------------|------|------|---------------------------------------------------------|------|------|------|-------|-------------------------------------------------|-----|---------------|-----|-----|-----|
| Rozměrová norma VN 42 0256                             |                     |      |      | Dimensional standard VN 42 0256                         |      |      |      |       | Massnorm VN 42 0256                             |     |               |     |     |     |
| Technické dodací podmínky                              |                     |      |      | Technical delivery conditions                           |      |      |      |       | Technische Lieferbedingungen                    |     |               |     |     |     |
|                                                        |                     |      |      |                                                         |      |      |      |       |                                                 |     |               |     |     |     |
| Vnější průměr                                          | Tloušťka stěny (mm) |      |      |                                                         |      |      |      |       |                                                 |     |               |     |     |     |
| Outside diameter                                       | Wall thickness (mm) |      |      |                                                         |      |      |      |       |                                                 |     |               |     |     |     |
| Außendurchmesser                                       | Wanddicke (mm)      |      |      |                                                         |      |      |      |       |                                                 |     |               |     |     |     |
| ( mm )                                                 | 14                  | 16   | 18   | 20                                                      | 22   | 25   | 28   | 32    | 36                                              | 40  | 46            | 50  | 54  | 60  |
| 60.3                                                   | 16.0                |      |      |                                                         |      |      |      |       |                                                 |     |               |     |     |     |
| 70                                                     | 19.3                | 21.3 | 23.1 | 24.7                                                    |      |      |      |       |                                                 |     | hmotnost kg/m |     |     |     |
| 76                                                     |                     | 23.7 | 25.7 | 27.6                                                    |      |      |      |       |                                                 |     | weight kg/m   |     |     |     |
| 82.5                                                   |                     | 26.2 | 28.6 | 30.8                                                    |      |      |      |       |                                                 |     | Gewicht kg/m  |     |     |     |
| 89                                                     |                     |      | 31.5 | 34.0                                                    | 36.4 | 39.5 |      |       |                                                 |     |               |     |     |     |
| 102                                                    |                     |      |      | 40.4                                                    | 43.4 | 47.5 |      |       |                                                 |     |               |     |     |     |
| 108                                                    |                     |      |      |                                                         | 46.7 | 51.2 |      |       |                                                 |     |               |     |     |     |
| 114                                                    |                     |      |      |                                                         | 49.9 | 54.9 |      |       |                                                 |     |               |     |     |     |
| 127                                                    |                     |      |      |                                                         |      | 62.9 | 68.4 | 75.0  |                                                 |     |               |     |     |     |
| 133                                                    |                     |      |      |                                                         |      |      | 72.5 | 79.7  |                                                 |     |               |     |     |     |
| 140                                                    |                     |      |      |                                                         |      |      | 77.3 | 85.2  |                                                 |     |               |     |     |     |
| 152                                                    |                     |      |      |                                                         |      |      | 85.6 | 94.7  |                                                 |     |               |     |     |     |
| 159                                                    |                     |      |      |                                                         |      |      |      | 100.2 |                                                 |     |               |     |     |     |
| 219                                                    |                     |      |      |                                                         |      |      |      |       | 162.5                                           | 177 |               |     |     |     |
| 245                                                    |                     |      |      |                                                         |      |      |      |       |                                                 | 202 | 226           |     |     |     |
| 273                                                    |                     |      |      |                                                         |      |      |      |       |                                                 | 230 | 258           | 275 |     |     |
| 324                                                    |                     |      |      |                                                         |      |      |      |       |                                                 | 280 | 315           | 338 | 360 | 391 |
| 356                                                    |                     |      |      |                                                         |      |      |      |       |                                                 | 312 | 352           | 377 | 402 | 438 |
| 377                                                    |                     |      |      |                                                         |      |      |      |       |                                                 | 332 | 376           | 403 | 430 | 469 |

|                                        |                                          |                                         |                                                                                    |
|----------------------------------------|------------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------|
| OCELOVÉ BEŽEŠVÉ TRUBKY VÝROBNÍ PROGRAM | SEAMLESS STEEL TUBES PRODUCTION PROGRAM  | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |  |
| MEZIROZMĚRY<br>PŘÍRUBOVÉ TRUBKY        | INTERMEDIATE DIMENSIONS<br>FLANGE COLLAR | ZWISCHENABMESSUNGEN<br>FLANSCHENROHRE   |                                                                                    |
|                                        |                                          |                                         |                                                                                    |

| MEZIROZMĚRY                                                                                                                                      |                     |      |      |      |      |      |      |      |      | INTERMEDIATE DIMENSIONS                                                                                                                                  |      |      |      |      |      |      |      |      |      | ZWISCHENABMESSUNGEN                                                                                                                                                                          |      |      |      |      |      |     |     |     |     |     |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------|------|------|------|------|------|------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|
| Meziorozměry se vyrábějí pouze po dohodě. U těchto nestandardních rozměrů je nutno v kupních smlouvách potvrzovat tolerance dle příslušné normy. |                     |      |      |      |      |      |      |      |      | Intermediate dimensions are produced based on agreement only and on order confirmations it is necessary to confirm tolerances according to the standard. |      |      |      |      |      |      |      |      |      | Zwischenabmessungen werden nur nach Vereinbarung hergestellt. Es ist notwendig, bei diesen nicht normgerechten Abmessungen in den Auftragsbestätigungen Toleranzen gem. entsprechenden Norm. |      |      |      |      |      |     |     |     |     |     |     |
|                                                                                                                                                  |                     |      |      |      |      |      |      |      |      |                                                                                                                                                          |      |      |      |      |      |      |      |      |      |                                                                                                                                                                                              |      |      |      |      |      |     |     |     |     |     |     |
| Vnější průměr                                                                                                                                    | Tloušťka stěny (mm) |      |      |      |      |      |      |      |      |                                                                                                                                                          |      |      |      |      |      |      |      |      |      |                                                                                                                                                                                              |      |      |      |      |      |     |     |     |     |     |     |
| Outside diameter                                                                                                                                 | Wall thickness (mm) |      |      |      |      |      |      |      |      |                                                                                                                                                          |      |      |      |      |      |      |      |      |      |                                                                                                                                                                                              |      |      |      |      |      |     |     |     |     |     |     |
| Außendurchmesser                                                                                                                                 | Wanddicke (mm)      |      |      |      |      |      |      |      |      |                                                                                                                                                          |      |      |      |      |      |      |      |      |      |                                                                                                                                                                                              |      |      |      |      |      |     |     |     |     |     |     |
| (mm)                                                                                                                                             | 6.3                 | 7    | 7.1  | 8    | 8.8  | 9    | 10   | 11   | 12.5 | 12.5                                                                                                                                                     | 14   | 14.2 | 16   | 17.5 | 18   | 20   | 22   | 22.2 | 24   | 25                                                                                                                                                                                           | 28   | 30   | 32   | 34   | 36   | 38  | 40  | 46  | 50  | 54  | 60  |
| 72.0                                                                                                                                             | 10.2                | 11.2 | 11.4 | 12.6 | 13.7 | 14.0 | 15.3 | 16.5 | 18.3 | 18.3                                                                                                                                                     | 20.0 | 20.2 | 22.1 | 23.5 | 24.0 | 25.6 |      |      |      |                                                                                                                                                                                              |      |      |      |      |      |     |     |     |     |     |     |
| 74.0                                                                                                                                             | 10.6                | 11.7 | 11.8 | 13.1 | 14.3 | 14.5 | 15.9 | 17.2 | 19.1 | 19.1                                                                                                                                                     | 20.9 | 21.1 | 23.1 | 24.6 | 25.1 | 26.9 |      |      |      |                                                                                                                                                                                              |      |      |      |      |      |     |     |     |     |     |     |
| 95.0                                                                                                                                             | 13.8                | 15.2 | 15.4 | 17.2 | 18.7 | 19.1 | 21.0 | 22.8 | 25.4 | 25.4                                                                                                                                                     | 28.0 | 28.3 | 31.2 | 33.4 | 34.2 | 37.0 | 39.6 | 39.9 | 42.0 | 43.2                                                                                                                                                                                         |      |      |      |      |      |     |     |     |     |     |     |
| 106.0                                                                                                                                            | 15.5                | 17.1 | 17.3 | 19.3 | 21.1 | 21.5 | 23.7 | 25.8 | 28.8 | 28.8                                                                                                                                                     | 31.8 | 32.1 | 35.5 | 38.2 | 39.1 | 42.4 | 45.6 | 45.9 | 48.5 | 49.9                                                                                                                                                                                         |      |      |      |      |      |     |     |     |     |     |     |
| 121.0                                                                                                                                            | 17.8                | 19.7 | 19.9 | 22.3 | 24.4 | 24.9 | 27.4 | 29.8 | 33.4 | 33.4                                                                                                                                                     | 36.9 | 37.4 | 41.4 | 44.7 | 45.7 | 49.8 | 53.7 | 54.1 | 57.4 | 59.2                                                                                                                                                                                         | 64.2 | 67.3 | 70.2 |      |      |     |     |     |     |     |     |
| 146.0                                                                                                                                            | 21.7                | 24.0 | 24.3 | 27.2 | 29.8 | 30.4 | 33.5 | 36.6 | 41.2 | 41.2                                                                                                                                                     | 45.6 | 46.2 | 51.3 | 55.5 | 56.8 | 62.1 | 67.3 | 67.8 | 72.2 | 74.6                                                                                                                                                                                         | 81.5 | 85.8 | 90.0 | 93.9 | 97.7 |     |     |     |     |     |     |
| 147.0                                                                                                                                            | 21.9                | 24.2 | 24.5 | 27.4 | 30.0 | 30.6 | 33.8 | 36.9 | 41.5 | 41.5                                                                                                                                                     | 45.9 | 46.5 | 51.7 | 55.9 | 57.3 | 62.6 | 67.8 | 68.3 | 72.8 | 75.2                                                                                                                                                                                         | 82.2 | 86.6 | 90.8 | 94.8 | 98.5 |     |     |     |     |     |     |
| 177.0                                                                                                                                            | 26.5                | 29.3 | 29.7 | 33.3 | 36.5 | 37.3 | 41.2 | 45.0 | 50.7 | 50.7                                                                                                                                                     | 56.3 | 57.0 | 63.5 | 68.8 | 70.6 | 77.4 | 84.1 | 84.8 | 90.6 | 93.7                                                                                                                                                                                         | 103  | 109  | 114  | 120  | 125  |     |     |     |     |     |     |
| 191.0                                                                                                                                            |                     |      |      | 36.1 | 39.5 | 40.4 | 44.6 | 48.8 | 55.0 | 55.0                                                                                                                                                     | 61.1 | 61.9 | 69.1 | 74.9 | 76.8 | 84.3 | 91.7 | 92.4 | 98.8 | 102                                                                                                                                                                                          | 113  | 119  | 126  | 132  | 138  | 143 | 149 |     |     |     |     |
| 193.0                                                                                                                                            |                     |      |      | 32.6 | 36.5 | 40.0 | 40.8 | 45.1 | 49.4 | 55.6                                                                                                                                                     | 55.6 | 61.8 | 62.6 | 69.8 | 75.7 | 77.7 | 85.3 | 92.8 | 93.5 | 100                                                                                                                                                                                          | 104  | 114  | 121  | 127  | 133  | 139 | 145 | 151 |     |     |     |
| 203.0                                                                                                                                            | 30.6                | 33.8 | 34.3 | 38.5 | 42.1 | 43.1 | 47.6 | 52.1 | 58.7 | 58.7                                                                                                                                                     | 65.3 | 66.1 | 73.8 | 80.1 | 82.1 | 90.3 | 98.2 | 99.0 | 106  | 110                                                                                                                                                                                          | 121  | 128  | 135  | 142  | 148  | 155 | 161 |     |     |     |     |
| 204.0                                                                                                                                            | 30.7                | 34.0 | 34.5 | 38.7 | 42.4 | 43.3 | 47.8 | 52.4 | 59.0 | 59.0                                                                                                                                                     | 65.6 | 66.5 | 74.2 | 80.5 | 82.6 | 90.8 | 98.7 | 99.5 | 107  | 110                                                                                                                                                                                          | 122  | 129  | 136  | 143  | 149  | 156 | 162 |     |     |     |     |
| 216.0                                                                                                                                            | 32.6                | 36.1 | 36.6 | 41.0 | 45.0 | 45.9 | 50.8 | 55.6 | 62.7 | 62.7                                                                                                                                                     | 69.7 | 70.7 | 78.9 | 85.7 | 87.9 | 96.7 | 105  | 106  | 114  | 118                                                                                                                                                                                          | 130  | 138  | 145  | 153  | 160  | 167 | 174 |     |     |     |     |
| 229.0                                                                                                                                            | 34.6                | 38.3 | 38.9 | 43.6 | 47.8 | 48.8 | 54.0 | 59.1 | 66.7 | 66.7                                                                                                                                                     | 74.2 | 75.2 | 84.1 | 91.3 | 93.7 | 103  | 112  | 113  | 121  | 126                                                                                                                                                                                          | 139  | 147  | 156  | 164  | 171  | 179 | 186 | 208 | 221 |     |     |
| 241.0                                                                                                                                            | 36.5                | 40.4 | 41.0 | 46.0 | 50.4 | 51.5 | 57.0 | 62.4 | 70.4 | 70.4                                                                                                                                                     | 78.4 | 79.4 | 88.8 | 96.5 | 99.0 | 109  | 119  | 120  | 128  | 133                                                                                                                                                                                          | 147  | 156  | 165  | 174  | 182  | 190 | 198 | 221 | 236 |     |     |
| 254.0                                                                                                                                            | 38.5                | 42.6 | 43.2 | 48.5 | 53.2 | 54.4 | 60.2 | 65.9 | 74.4 | 74.4                                                                                                                                                     | 82.9 | 84.0 | 93.9 | 102  | 105  | 115  | 126  | 127  | 136  | 141                                                                                                                                                                                          | 156  | 166  | 175  | 185  | 194  | 202 | 211 | 236 |     |     |     |
| 267.0                                                                                                                                            | 40.5                | 44.9 | 45.5 | 51.1 | 56.0 | 57.3 | 63.4 | 69.4 | 78.5 | 78.5                                                                                                                                                     | 87.4 | 88.5 | 99.0 | 108  | 111  | 122  | 133  | 134  | 144  | 149                                                                                                                                                                                          | 165  | 175  | 186  | 195  | 205  | 215 | 224 | 251 | 268 |     |     |
| 279.0                                                                                                                                            |                     | 47.0 | 47.6 | 53.5 | 58.6 | 59.9 | 66.3 | 72.7 | 82.2 | 82.2                                                                                                                                                     | 91.5 | 92.7 | 104  | 113  | 116  | 128  | 139  | 141  | 151  | 157                                                                                                                                                                                          | 173  | 184  | 195  | 205  | 216  | 226 | 236 | 264 | 282 |     |     |
| 292.0                                                                                                                                            |                     | 49.2 | 49.9 | 56.0 | 61.5 | 62.8 | 69.5 | 76.2 | 86.2 | 86.2                                                                                                                                                     | 96.0 | 97.3 | 109  | 119  | 122  | 134  | 147  | 148  | 159  | 165                                                                                                                                                                                          | 182  | 194  | 205  | 216  | 227  | 238 | 249 | 279 | 298 | 317 |     |
| 296.0                                                                                                                                            |                     | 49.9 | 50.6 | 56.8 | 62.3 | 63.7 | 70.5 | 77.3 | 87.4 | 87.4                                                                                                                                                     | 97.4 | 98.7 | 111  | 120  | 123  | 136  | 149  | 150  | 161  | 167                                                                                                                                                                                          | 185  | 197  | 208  | 220  | 231  | 242 | 253 | 284 | 303 | 322 |     |
| 298.5                                                                                                                                            |                     | 50.3 | 51.0 | 57.3 | 62.9 | 64.3 | 71.1 | 78.0 | 88.2 | 88.2                                                                                                                                                     | 98.2 | 99.6 | 112  | 121  | 125  | 137  | 150  | 151  | 163  | 169                                                                                                                                                                                          | 187  | 199  | 210  | 222  | 233  | 244 | 255 | 286 | 306 | 326 |     |
| 305.0                                                                                                                                            |                     | 51.4 | 52.2 | 58.6 | 64.3 | 65.7 | 72.8 | 79.8 | 90.2 | 90.2                                                                                                                                                     | 101  | 102  | 114  | 124  | 127  | 141  | 154  | 155  | 166  | 173                                                                                                                                                                                          | 191  | 204  | 215  | 227  | 239  | 250 | 261 | 294 | 314 | 334 |     |
| 318.0                                                                                                                                            |                     |      |      | 61.2 | 67.1 | 68.6 | 76.0 | 83.3 | 94.2 | 94.2                                                                                                                                                     | 105  | 106  | 119  | 130  | 133  | 147  | 161  | 162  | 174  | 181                                                                                                                                                                                          | 200  | 213  | 226  | 238  | 250  | 262 | 274 | 309 | 331 | 352 |     |
| 330.0                                                                                                                                            |                     |      |      | 63.5 | 69.7 | 71.2 | 78.9 | 86.5 | 97.9 | 97.9                                                                                                                                                     | 109  | 111  | 124  | 135  | 139  | 153  | 167  | 169  | 181  | 188                                                                                                                                                                                          | 209  | 222  | 235  | 248  | 261  | 274 | 286 | 322 | 345 | 368 | 400 |
| 368.0                                                                                                                                            |                     |      |      |      | 78.0 | 79.7 | 88.3 | 96.8 | 110  | 110                                                                                                                                                      | 122  | 124  | 139  | 151  | 155  | 172  | 188  | 189  | 204  | 212                                                                                                                                                                                          | 235  | 250  | 265  | 280  | 295  | 309 | 324 | 365 | 392 | 418 | 456 |
| 394.0                                                                                                                                            |                     |      |      |      |      |      |      |      |      |                                                                                                                                                          |      |      |      | 163  | 167  | 185  | 202  | 204  | 219  | 228                                                                                                                                                                                          | 253  | 269  | 286  | 302  | 318  | 334 | 349 |     |     |     |     |

| PŘÍRUBOVÉ TRUBKY |                                                                                                                                                              | FLANGE COLLAR |                                                                                                                                                                        | FLANSCHENROHRE |                                                                                                                                                                        |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  |                                                                                                                                                              |               |                                                                                                                                                                        |                |                                                                                                                                                                        |
| Vnější průměr    | Tloušťka stěny (mm)                                                                                                                                          |               |                                                                                                                                                                        |                |                                                                                                                                                                        |
| Outside diameter | Wall thickness (mm)                                                                                                                                          |               |                                                                                                                                                                        |                |                                                                                                                                                                        |
| Außendurchmesser | Wanddicke (mm)                                                                                                                                               |               |                                                                                                                                                                        |                |                                                                                                                                                                        |
| (mm)             | 4                                                                                                                                                            | 4,5           | 5                                                                                                                                                                      |                |                                                                                                                                                                        |
| 108              | 5 – 6                                                                                                                                                        | xxx           | 5 – 6                                                                                                                                                                  |                |                                                                                                                                                                        |
| 159              | xxx                                                                                                                                                          | 5 – 6         | xxx                                                                                                                                                                    |                |                                                                                                                                                                        |
|                  |                                                                                                                                                              |               |                                                                                                                                                                        |                |                                                                                                                                                                        |
| POZNÁMKA         |                                                                                                                                                              | NOTICE        |                                                                                                                                                                        | VERMERK        |                                                                                                                                                                        |
|                  | Trubky dodávané pro trh České republiky dle ČSN 42 0250 a rozměrové normy VN 42 5791. Materiály dle ČSN – 11 353, 11368, 11369, 12 021. Přírubový lem PN 40. |               | Tubes supplied in the Czech market according to ČSN 420250 and Dimensional Standard HV 42 5791. Grades acc. to ČSN – 11353, 11368, 11369, 12 021. Flange Collar PN 40. |                | Rohre geliefert für den tschechischen Markt gem. ČSN 42 0250 und gem. Abmessungsnormen VN 42 5791. Güten gem. ČSN – 11 353, 11368, 11369, 12 021. Flanschenrand PN 40. |



|                                              |                                         |                                         |
|----------------------------------------------|-----------------------------------------|-----------------------------------------|
| OCÉLOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM       | SEAMLESS STEEL TUBES PRODUCTION PROGRAM | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |
| TRUBKY PRO TĚŽBU NAFTY, ZEMNÍHO PLYNU A VODY | OIL COUNTRY TUBULAR GOODS               | NAHTLOSE ÖLFELDROHRE                    |
| Pažnicové trubky Casing                      | Casing                                  | Futterrohre                             |

| TRUBKY PRO TĚŽBU NAFTY, ZEMNÍHO PLYNU A VODY                                                                                                                                                                                                                                                                  | OIL COUNTRY TUBULAR GOODS                                                                                                                                                                                                                                                                                        | NAHTLOSE ÖLFELDROHRE                                                                                                                                                                                                                                                                                                                                                                                                                                 |               |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------|--|-----|-----|-----|--------------|-------------|--------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|-----|------|--|-----|-----|-----|------------------|-------------|--------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----|-----|------|--|-----|-----|-----|------------|-------------|--------------|---------------|
| Pažnicové trubky Casing                                                                                                                                                                                                                                                                                       | Casing                                                                                                                                                                                                                                                                                                           | Futterrohre                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
| <p>Pažnicové trubky Casing jsou bezešvé ocelové trubky za tepla válcované, se speciálním pravotočivým závitem podle normy API Spec. 5 B na obou koncích trubky. Trubky se spojují nátrubkem. Výroba, kontrola, dodávky a rozměry jsou stanoveny technickými dodacími předpisy podle norem API Spec. 5 CT.</p> | <p>Casing is seamless, hot rolled steel pipe provided with special right-hand threads on both ends as required by API Spec. 5 B, with couplings and thread protectors.</p> <p>Production, inspection, deliveries and dimensions are determined by technical delivery conditions according to API Spec. 5 CT.</p> | <p>Die Futterrohre sind nahtlose warmgewalzte Stahlrohre, die auf beiden Enden mit dem rechtsgängigen Gewinde nach der Norm API Spec. 5 B versehen sind. Sie werden zur Verröhrung von Bohrlöchern bei der Erdöl-, Erdgas- und Wassergewinnung verwendet. Die Rohre werden mittels Rohrstutzen verbunden. Die Fertigung, Kontrolle, Lieferungen und Rohrstutzen sind durch technische Lieferbedingungen gemäss Normen API Spec. 5 CT festgelegt.</p> |               |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
| <p><b>Jakost materiálu</b></p> <p>Dodáváme pažnicové trubky a nátrubky Casing z materiálů dle API jakostních stupňů H-40, J-55, K-55, N-80 typ 1 a typ Q a L 80 typ1.</p>                                                                                                                                     | <p><b>Steel Grades</b></p> <p>We supply casing with couplings in grades H-40, J-55, K-55, N-80 typ 1 and typ Q and L 80 typ1 as required by API specifications.</p>                                                                                                                                              | <p><b>Werkstoffgüte</b></p> <p>Wir liefern die Bohrröhre und Rohrstutzen Casing aus den Werkstoffen gemäss API, Gütegrade H-40, J-55, K-55, N-80 typ 1 und typ Q und L 80 typ1.</p>                                                                                                                                                                                                                                                                  |               |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
| <p><b>Rozměry trubek a nátrubků</b></p> <p>Rozměrová norma a TDP: API Spec. 5 CT</p> <p>Norma pro závit: API Spec. 5 B</p>                                                                                                                                                                                    | <p><b>Dimensions of Casing and Couplings</b></p> <p>Dimensional standard and technical delivery conditions: API Spec. 5 CT</p> <p>Threads: API Spec. 5 B</p>                                                                                                                                                     | <p><b>Abmessungen der Rohre und Rohrstutzen</b></p> <p>Massnorm sowie technische Lieferbedingungen: API Spec. 5 CT</p> <p>Gewindenorm: API Spec. 5 B</p>                                                                                                                                                                                                                                                                                             |               |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
| <p><b>Dovolené mezní úchytky trubek</b></p> <p>Vnější průměr trubky + 1% /– 0,5%, horní hranice nesmí překročit hodnotu + 3,18 mm</p> <p>Tloušťka stěny trubky – 12,5 %, max. imální tloušťka stěny je limitována hmotností.</p> <p>Tolerance hmotnosti jednotlivých trubek + 6,5% / – 3,5 %</p>              | <p><b>Permissible Variations</b></p> <p>Outside diameter + 1% /– 0,5%, upper limits shall not exceed + 3,18 mm</p> <p>Wall thickness – 12,5 %, maximum wall thickness is limited by weight</p> <p>Tolerances of weight of individual tubes + 6,5% / – 3,5 %</p>                                                  | <p><b>Zulässige Grenzabweichungen der Rohre</b></p> <p>Außendurchmesser + 1% /– 0,5%, die obere Grenze darf den Wert + 3,18 mm nicht überschreiten.</p> <p>Wanddicke – 12,5 %, die maximale Wanddicke ist durch das Gewicht limitiert.</p> <p>Gewichtstoleranz von einzelnen Rohren + 6,5% / – 3,5 %</p>                                                                                                                                             |               |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
| <p><b>Délky</b></p> <p>Pažnicové trubky se dodávají ve skupinových délkách – RANGE</p>                                                                                                                                                                                                                        | <p><b>Lengths</b></p> <p>Casings are supplied in Ranges.</p>                                                                                                                                                                                                                                                     | <p><b>Längenbereich</b></p> <p>Bohrröhre werden in Range-Gruppenlängen geliefert.</p>                                                                                                                                                                                                                                                                                                                                                                |               |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
| <table><tr><th>Skupina rozsahu</th><th>I.</th><th>II.</th><th>III.</th></tr><tr><td></td><td>(m)</td><td>(m)</td><td>(m)</td></tr><tr><td>Délky trubek</td><td>4,88 – 7,62</td><td>7,62 – 10,36</td><td>10,36 – 14,63</td></tr></table>                                                                       | Skupina rozsahu                                                                                                                                                                                                                                                                                                  | I.                                                                                                                                                                                                                                                                                                                                                                                                                                                   | II.           | III. |  | (m) | (m) | (m) | Délky trubek | 4,88 – 7,62 | 7,62 – 10,36 | 10,36 – 14,63 | <table><tr><th>Range</th><th>I.</th><th>II.</th><th>III.</th></tr><tr><td></td><td>(m)</td><td>(m)</td><td>(m)</td></tr><tr><td>Lengths of tubes</td><td>4.88 – 7.62</td><td>7.62 – 10.36</td><td>10.36 – 14.63</td></tr></table> | Range | I. | II. | III. |  | (m) | (m) | (m) | Lengths of tubes | 4.88 – 7.62 | 7.62 – 10.36 | 10.36 – 14.63 | <table><tr><th>Umfangsgruppe</th><th>I.</th><th>II.</th><th>III.</th></tr><tr><td></td><td>(m)</td><td>(m)</td><td>(m)</td></tr><tr><td>Rohrlängen</td><td>4,88 – 7,62</td><td>7,62 – 10,36</td><td>10,36 – 14,63</td></tr></table> | Umfangsgruppe | I. | II. | III. |  | (m) | (m) | (m) | Rohrlängen | 4,88 – 7,62 | 7,62 – 10,36 | 10,36 – 14,63 |
| Skupina rozsahu                                                                                                                                                                                                                                                                                               | I.                                                                                                                                                                                                                                                                                                               | II.                                                                                                                                                                                                                                                                                                                                                                                                                                                  | III.          |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
|                                                                                                                                                                                                                                                                                                               | (m)                                                                                                                                                                                                                                                                                                              | (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                  | (m)           |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
| Délky trubek                                                                                                                                                                                                                                                                                                  | 4,88 – 7,62                                                                                                                                                                                                                                                                                                      | 7,62 – 10,36                                                                                                                                                                                                                                                                                                                                                                                                                                         | 10,36 – 14,63 |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
| Range                                                                                                                                                                                                                                                                                                         | I.                                                                                                                                                                                                                                                                                                               | II.                                                                                                                                                                                                                                                                                                                                                                                                                                                  | III.          |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
|                                                                                                                                                                                                                                                                                                               | (m)                                                                                                                                                                                                                                                                                                              | (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                  | (m)           |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
| Lengths of tubes                                                                                                                                                                                                                                                                                              | 4.88 – 7.62                                                                                                                                                                                                                                                                                                      | 7.62 – 10.36                                                                                                                                                                                                                                                                                                                                                                                                                                         | 10.36 – 14.63 |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
| Umfangsgruppe                                                                                                                                                                                                                                                                                                 | I.                                                                                                                                                                                                                                                                                                               | II.                                                                                                                                                                                                                                                                                                                                                                                                                                                  | III.          |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
|                                                                                                                                                                                                                                                                                                               | (m)                                                                                                                                                                                                                                                                                                              | (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                  | (m)           |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
| Rohrlängen                                                                                                                                                                                                                                                                                                    | 4,88 – 7,62                                                                                                                                                                                                                                                                                                      | 7,62 – 10,36                                                                                                                                                                                                                                                                                                                                                                                                                                         | 10,36 – 14,63 |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |
| <p><b>Povrch a dodávky</b></p> <p>Povrch trubek, ochrana závitů, značení trubek, kontrola, zkoušení a přejímání jsou stanoveny technickými dodacími předpisy dle norem API Spec. 5 CT.</p>                                                                                                                    | <p><b>Surface and Delivery</b></p> <p>Tube surface, thread protection, pipe designation, inspection, testing and acceptance requirements are specified by API Spec. 5 CT.</p>                                                                                                                                    | <p><b>Oberfläche und Lieferungen</b></p> <p>Rohroberfläche, Gewindeschutz, Rohrmarkierung, Kontrolle, Prüfungen und Abnahme sind in den technischen Lieferbedingungen nach den API – Normen Spec. 5 CT festgelegt.</p>                                                                                                                                                                                                                               |               |      |  |     |     |     |              |             |              |               |                                                                                                                                                                                                                                   |       |    |     |      |  |     |     |     |                  |             |              |               |                                                                                                                                                                                                                                     |               |    |     |      |  |     |     |     |            |             |              |               |

|                                              |                                         |                                         |                                                                                    |
|----------------------------------------------|-----------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM       | SEAMLESS STEEL TUBES PRODUCTION PROGRAM | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |  |
| TRUBKY PRO TĚŽBU NAFTY, ZEMNÍHO PLYNU A VODY | OIL COUNTRY TUBULAR GOODS               | NAHTLOSE ÖLFELDROHRE                    |                                                                                    |
| Pažnicové trubky Casing                      | Casing                                  | Futterrohre                             |                                                                                    |

| TRUBKY           |                |          |       |                  | TUBES  |               |     |    |     | ROHRE       |                           |        |
|------------------|----------------|----------|-------|------------------|--------|---------------|-----|----|-----|-------------|---------------------------|--------|
|                  |                |          |       |                  |        |               |     |    |     |             |                           |        |
| Vnější průměr    | tloušťka stěny | Hmotnost |       | Zvýšená hmotnost | Jakost | Závity        |     |    | CET | Max. délka  | Průchozí průměr           |        |
| Outside diameter | Wall thickness | Weight   |       | Increased weight | Grade  | Threads       |     |    | CET | Max. length | Drift diameter            |        |
| Außendurchmesser | Wanddicke      | Gewicht  |       | Erhöhtes Gewicht | Güte   | Gewinde       |     |    | CET | Max. Länge  | Durchgehender Durchmesser |        |
| inch             | mm             | mm       | Lb/ft | kg/m             | kg/m   |               | STC | LC | BC  | max.        | m                         | inch   |
| 9 5/8            | 244,48         | 7,92     | 32,30 | 46,20            | 48,07  | H40           | x   |    |     | –           | 13                        | 8,845  |
|                  |                | 8,94     | 36,00 | 51,93            | 53,57  | H40           |     |    |     | –           | 13                        | 8,765  |
|                  |                | 8,94     | 36,00 | 51,93            | 53,57  | J55, K55      | x   | x  | x   | 0,58        | 13                        | 8,765  |
|                  |                | 10,03    | 40,00 | 57,99            | 59,93  | J55, K55      | x   | x  | x   | 0,58        | 13                        | 8,679  |
|                  |                | 10,03    | 40,00 | 57,99            | 59,93  | L80           |     | x  | x   | 0,58        | 13                        | 8,679  |
|                  |                | 10,03    | 40,00 | 57,99            | 59,93  | N80 Type 1, Q |     | x  | x   | 0,58        | 13                        | 8,679  |
|                  |                | 11,05    | 43,50 | 63,61            | 64,73  | L80           |     | x  | x   | 0,58        | 13                        | 8,599  |
|                  |                | 11,05    | 43,50 | 63,61            | 64,73  | N80 Type 1, Q |     | x  | x   | 0,58        | 13                        | 8,599  |
|                  |                | 11,99    | 47,00 | 68,75            | 69,94  | L80           |     | x  | x   | 0,58        | 13                        | 8,525  |
| 10 3/4           | 273,05         | 8,89     | 40,50 | 57,91            | 60,27  | H40           | x   |    |     | –           | 13                        | 9,894  |
|                  |                | 8,89     | 40,50 | 57,91            | 60,27  | J55, K55      | x   |    | x   | 0,58        | 13                        | 9,894  |
|                  |                | 10,16    | 45,50 | 65,87            | 67,71  | J55, K55      | x   |    | x   | 0,58        | 13                        | 9,794  |
|                  |                | 11,43    | 51,00 | 73,75            | 75,90  | J55, K55      | x   |    | x   | 0,58        | 13                        | 9,694  |
|                  |                | 11,43    | 51,00 | 73,75            | 75,90  | L80           | x   |    | x   | 0,58        | 13                        | 9,694  |
| 11 3/4           | 298,50         | 11,43    | 51,00 | 73,75            | 75,90  | N80 Type 1, Q | x   |    | x   | 0,58        | 13                        | 9,694  |
|                  |                | 8,46     | 42,00 | 62,56            | 62,50  | H40           | x   |    |     | –           | 13                        | 10,928 |
|                  |                | 9,53     | 47,00 | 67,83            | 69,94  | J55, K55      | x   |    | x   | 0,58        | 13                        | 10,844 |
|                  |                | 11,05    | 54,00 | 78,32            | 80,36  | J55, K55      | x   |    | x   | 0,58        | 13                        | 10,724 |
| 13 3/8           | 339,72         | 12,42    | 60,00 | 87,61            | 89,29  | J55, K55      | x   |    | x   | 0,58        | 13                        | 10,616 |
|                  |                | 8,38     | 48,00 | 68,48            | 71,34  | H40           | x   |    |     | –           | 13                        | 12,559 |
|                  |                | 9,65     | 54,50 | 78,55            | 81,10  | J55, K55      | x   |    | x   | 0,58        | 13                        | 12,459 |
|                  |                | 10,92    | 61,00 | 88,55            | 90,78  | J55, K55      | x   |    | x   | 0,58        | 13                        | 12,359 |
|                  |                | 12,19    | 68,00 | 98,46            | 101,19 | J55, K55      | x   |    | x   | 0,58        | 12                        | 12,259 |
|                  |                | 12,19    | 68,00 | 98,46            | 101,19 | L80           | x   |    | x   | 0,58        | 12                        | 12,259 |
|                  |                | 12,19    | 68,00 | 98,46            | 101,19 | N80 Type 1, Q | x   |    | x   | 0,58        | 12                        | 12,259 |
|                  |                | 13,06    | 72,00 | 105,21           | 107,15 | L80           | x   |    | x   | 0,58        | 11                        | 12,191 |
|                  |                | 13,06    | 72,00 | 105,21           | 107,15 | N80 Type 1, Q | x   |    | x   | 0,58        | 11                        | 12,191 |

| POZNÁMKA                                                                                                                                                                                    |  | NOTICE                                                                                                                                                                                                                               |  | VERMERK                                                                                                                                                                                                                                                            |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Jsou možné dodávky trubek i s hladkými konci.                                                                                                                                               |  | Supply of tubes with plain ends is possible.                                                                                                                                                                                         |  | Rohre können auch mit glatten Enden geliefert werden.                                                                                                                                                                                                              |  |
| Uhlíkový ekvivalent CET pro pažnicové trubky:<br>CET = C + (Mn + Mo)/10 + (Cr + Cu)/20 + Ni/40                                                                                              |  | Carbon equivalent CET for casing:<br>CET = C + (Mn + Mo)/10 + (Cr + Cu)/20 + Ni/40                                                                                                                                                   |  | Kohlenstoffequivalent CET für Futterrohre:<br>CET = C + (Mn + Mo)/10 + (Cr + Cu)/20 + Ni/40                                                                                                                                                                        |  |
| Vyrábíme po dohodě.<br>Lze vyrobit LC závit i bez Monogramu API.<br>Je možno rovněž po dohodě dodávat bez Monogramu API následující rozměry: 9 5/8 x 59,40; 9 5/8 x 64,90 a 13 3/8 x 77,00. |  | Special agreement necessary.<br>It's possible to also produce a thread without API Monogram.<br>Supply of tubes without API Monogram is possible also for the following dimensions: 9 5/8 x 59,40; 9 5/8 x 64,90 and 13 3/8 x 77,00. |  | Wir fertigen im begrenzten Umfang und nur nach Vereinbarung.<br>Ist möglich herstellen Gewinde auch ohne Monogramm API.<br>Nach Vereinbarung können folgende Abmessungen ohne das Monogramm API geliefert werden: 9 5/8 x 59,40; 9 5/8 x 64,90 und 13 3/8 x 77,00. |  |

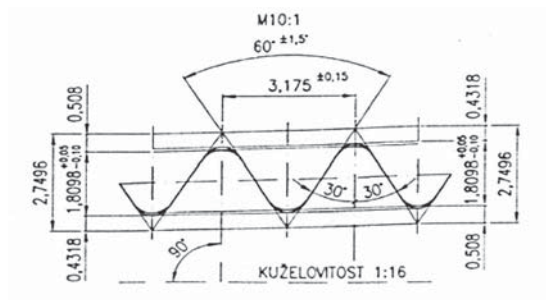
| TRUBKY PRO NÁTRUBKY |  | COUPLINGS STOCKS |  | ROHRE FÜR MUFFEN   |  |
|---------------------|--|------------------|--|--------------------|--|
|                     |  |                  |  |                    |  |
| Vnější průměr       |  |                  |  | Jakost             |  |
| Outside diameter    |  |                  |  | Grade              |  |
| Außendurchmesser    |  |                  |  | Güte               |  |
| inch                |  | mm               |  |                    |  |
| 9.625               |  | 244,48           |  | J55, K55, N80, L80 |  |
| 10.625              |  | 269,88           |  |                    |  |
| 11.750              |  | 298,45           |  |                    |  |
| 14.375              |  | 365,12           |  |                    |  |

| POZNÁMKA                                                      |  | NOTICE                                                                           |  | VERMERK                                                                 |  |
|---------------------------------------------------------------|--|----------------------------------------------------------------------------------|--|-------------------------------------------------------------------------|--|
| Délka, tloušťka stěny a tolerance vnějšího průměru po dohodě. |  | Lenght, wall thickness and tolerance of the outside diameter after an agreement. |  | Länge, Wanddicke und Toleranzen bei Außendurchmesser nach Vereinbarung. |  |

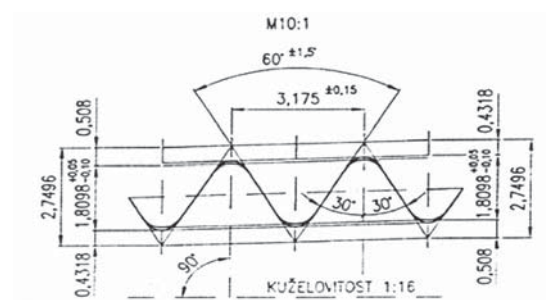


|                                              |                                         |                                         |
|----------------------------------------------|-----------------------------------------|-----------------------------------------|
| OCÉLOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM       | SEAMLESS STEEL TUBES PRODUCTION PROGRAM | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |
| TRUBKY PRO TĚŽBU NAFTY, ZEMNÍHO PLYNU A VODY | OIL COUNTRY TUBULAR GOODS               | NAHTLOSE ÖLFELDROHRE                    |
| Pažnicové trubky Casing                      | Casing                                  | Futterrohre                             |

- DETAIL OBLÉHO ZÁVITU – TRUBKA
- SCHEME OF LONG ROUND THERAD – TUBE
- DETAIL DES RUNDGEWINDES – ROHR



- DETAIL OBLÉHO ZÁVITU – NÁTRUBEK
- SCHEME OF LONG ROUND THREAD – COUPLING
- DETAIL DES RUNDGEWINDES – MUFFE

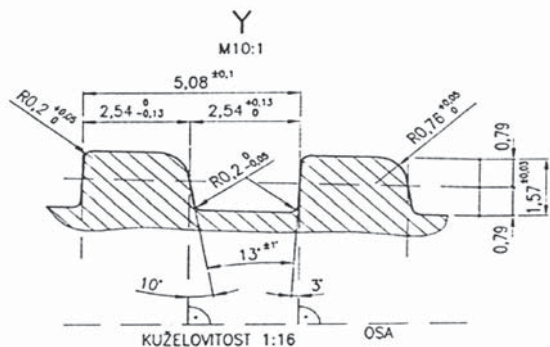


| NÁTRUBKY               |        | COUPLINGS              | MUFFEN                  |
|------------------------|--------|------------------------|-------------------------|
| Závit oblý dlouhý – LC |        | Long round thread – LC | Rundes Langgewinde – LC |
| Vnější průměr          |        | Min. délka závitu      | Hmotnost                |
| Outside diameter       |        | Min. length of threads | Weight                  |
| Außendurchmesser       |        | Mindestgewindelänge    | Gewicht                 |
| inch                   | mm     | mm                     | Lb/ft                   |
| 9 5/8                  | 269.90 | 266.70                 | 25.45                   |

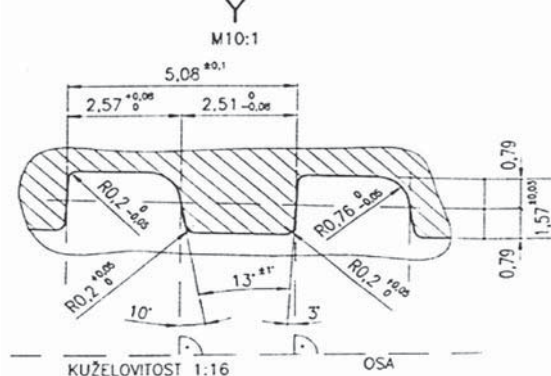
| NÁTRUBKY                |        | COUPLINGS                | MUFFEN                   |
|-------------------------|--------|--------------------------|--------------------------|
| Závit oblý krátký – STC |        | Short round thread – STC | Rundes Kurzgewinde – STC |
| Vnější průměr           |        | Min. délka závitu        | Hmotnost                 |
| Outside diameter        |        | Min. length of threads   | Weight                   |
| Außendurchmesser        |        | Mindestgewindelänge      | Gewicht                  |
| inch                    | mm     | mm                       | Lb/ft                    |
| 9 5/8                   | 269.90 | 196.85                   | 18.03                    |
| 10 3/4                  | 298.40 | 203.20                   | 20.78                    |
| 11 3/4                  | 323.80 | 203.20                   | 22.64                    |
| 13 3/8                  | 365.10 | 203.20                   | 25.66                    |



- DETAIL ZÁVITU BUTTRESS – TRUBKA
- SCHEME OF BUTTRESS THREAD – TUBE
- DETAIL DES GEWINDES BUTTRESS – ROHR



- DETAIL ZÁVITU BUTTRESS – NÁTRUBEK
- SCHEME OF BUTTRESS THREAD – COUPLING
- DETAIL DES GEWINDES BUTTRESS – MUFFE



| NÁTRUBKY                  |        | COUPLINGS              | MUFFEN             |
|---------------------------|--------|------------------------|--------------------|
| Závít lichoběžníkový – BC |        | Buttress thread – BC   | Trapezgewinde – BC |
| Vnější průměr             |        | Min. délka závitu      | Hmotnost           |
| Outside diameter          |        | Min. length of threads | Weight             |
| Außendurchmesser          |        | Mindestgewindelänge    | Gewicht            |
| inch                      | mm     | mm                     | Lb/ft              |
| 9 5/8                     | 269.90 | 269.90                 | 23.16              |
| 10 3/4                    | 298.40 | 269.90                 | 25.74              |
| 11 3/4                    | 323.80 | 269.90                 | 28.03              |
| 13 3/8                    | 365.10 | 269.90                 | 31.77              |



|                                              |                                         |                                         |
|----------------------------------------------|-----------------------------------------|-----------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM       | SEAMLESS STEEL TUBES PRODUCTION PROGRAM | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |
| TRUBKY PRO TĚŽBU NAFTY, ZEMNÍHO PLYNU A VODY | OIL COUNTRY TUBULAR GOODS               | NAHTLOSE ÖLFELDROHRE                    |
| Naftovodné trubky Line Pipe                  | Line Pipe                               | Leitungsrohre                           |

| TRUBKY PRO TĚŽBU NAFTY, ZEMNÍHO PLYNU A VODY                                                                                                                                       | OIL COUNTRY TUBULAR GOODS                                                                                                                                              | NAHTLOSE ÖLFELDROHRE                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Naftovodné trubky Line Pipe                                                                                                                                                        | Line Pipe                                                                                                                                                              | Leitungsrohre                                                                                                                                                                                   |
| <p>Ocelové bezešvé trubky válcované za tepla se dodávají dle váhových standardů ANSI/ASME B 36.10 M – 1985 s kolmo upíchnutými konci nebo s kalibrovanými a úkosovanými konci.</p> | <p>Hot rolled steel seamless line pipe is supplied in the weight standard according to ANSI/ASME B 36.10 M – 1985 with plain ends or calibrated and bevelled ends.</p> | <p>Nahtlose warmgewalzte Stahlrohre werden nach den Gewichtsstandards ANSI/ASME B 36.10 M – 1985 mit senkrecht abgestochenen Enden oder mit kalibrierten und abgeschrägten Enden geliefert.</p> |
| <b>Rozměry</b><br>Trubky se dodávají dle API Spec. 5 L                                                                                                                             | <b>Dimensions</b><br>Tubes are supplied according to API Spec. 5 L.                                                                                                    | <b>Abmessungen</b><br>Rohre werden gemäss API Spec. 5 L geliefert                                                                                                                               |
| <b>Dovolené mezní úchytky trubek</b>                                                                                                                                               | <b>Permissible Variations</b>                                                                                                                                          | <b>Zulässige Grenzabweichungen der Rohre</b>                                                                                                                                                    |
| Vnější průměr                                                                                                                                                                      | Outside diameter                                                                                                                                                       | Außendurchmesser                                                                                                                                                                                |
| ± 0,75 %                                                                                                                                                                           | ± 0.75 %                                                                                                                                                               | ± 0,75 %                                                                                                                                                                                        |
| Tloušťka stěny                                                                                                                                                                     | Wall thickness                                                                                                                                                         | Wanddicke                                                                                                                                                                                       |
| + 15 % / – 12,5 %                                                                                                                                                                  | + 15 % / – 12.5 %                                                                                                                                                      | + 15 % / – 12,5 %                                                                                                                                                                               |
| Hmotnost jednotlivých trubek                                                                                                                                                       | Weight of individual tubes                                                                                                                                             | Gewicht einzelner Rohre                                                                                                                                                                         |
| + 10 % / – 3,5 %                                                                                                                                                                   | + 10 % / – 3.5 %                                                                                                                                                       | + 10 % / – 3,5 %                                                                                                                                                                                |
| <b>Délky</b>                                                                                                                                                                       | <b>Lengths</b>                                                                                                                                                         | <b>Längenbereich</b>                                                                                                                                                                            |
| <b>Nominální délka (ft)</b>                                                                                                                                                        | <b>Nominal length (ft)</b>                                                                                                                                             | <b>Nennlänge (ft)</b>                                                                                                                                                                           |
| 20 (6 m)                                                                                                                                                                           | 20 (6 m)                                                                                                                                                               | 20 (6 m)                                                                                                                                                                                        |
| 40 (12 m)                                                                                                                                                                          | 40 (12 m)                                                                                                                                                              | 40 (12 m)                                                                                                                                                                                       |
| <b>Minimální délka (m)</b>                                                                                                                                                         | <b>Minimum length (m)</b>                                                                                                                                              | <b>Min. Länge (m)</b>                                                                                                                                                                           |
| 2,74                                                                                                                                                                               | 2.74                                                                                                                                                                   | 2,74                                                                                                                                                                                            |
| 4,27                                                                                                                                                                               | 4.27                                                                                                                                                                   | 4,27                                                                                                                                                                                            |
| <b>Průměrná délka (m)</b>                                                                                                                                                          | <b>Average length (m)</b>                                                                                                                                              | <b>Durchschnittlänge (m)</b>                                                                                                                                                                    |
| 5,33                                                                                                                                                                               | 5.33                                                                                                                                                                   | 5,33                                                                                                                                                                                            |
| 10,67                                                                                                                                                                              | 10.67                                                                                                                                                                  | 10,67                                                                                                                                                                                           |
| <b>Maximální délka (m)</b>                                                                                                                                                         | <b>Maximum length (m)</b>                                                                                                                                              | <b>Max. Länge (m)</b>                                                                                                                                                                           |
| 6,86                                                                                                                                                                               | 6.86                                                                                                                                                                   | 6,86                                                                                                                                                                                            |
| 13,72                                                                                                                                                                              | 13.72                                                                                                                                                                  | 13,72                                                                                                                                                                                           |
| <p>Výroba, značení, povrchová úprava, kontrola, přejímky, mechanické a chemické složení odpovídají dodacím předpisům norem API Spec. 5 L.</p>                                      | <p>Production, marking, surface finishing, inspection, acceptance, mechanical properties and chemical composition comply with API Spec. 5 L.</p>                       | <p>Fertigung, Rohrmarkierung, Oberflächenbehandlung, Kontrolle, Abnahmen, mechanische Eigenschaften und chemische Zusammensetzung entsprechen den Vorschriften der Normen API Spec. 5 L.</p>    |

| NAFTOVODNÉ TRUBKY LINE PIPE |                     |                | LINE PIPE                    |   |      |      |      | LEITUNGSROHRE |                                                              |                 |
|-----------------------------|---------------------|----------------|------------------------------|---|------|------|------|---------------|--------------------------------------------------------------|-----------------|
| Vnější průměr               |                     | Tloušťka stěny | Jakost                       |   |      |      |      |               |                                                              | Hmotnost        |
| Outside diameter            |                     | Wall thickness | Grade                        |   |      |      |      |               |                                                              | Weight          |
| Außendurchmesser            |                     | Wanddicke      | Güte                         |   |      |      |      |               |                                                              | Gewicht         |
| inch                        | mm                  | mm             |                              |   |      |      |      |               |                                                              | kg/m            |
| 6 5/8                       | 168.3               | 7.1 – 22.2     | A                            | B | X 42 | X 46 | X 52 | X 56          | X 60                                                         | 28.22 – 79.98   |
| 8 5/8                       | 219.1               | 7.0 – 25.4     | A                            | B | X 42 | X 46 | X 52 | X 56          | X 60                                                         | 36.61 – 121.32  |
| 10 3/4                      | 273.1               | 7.1 – 25.4     | A                            | B | X 42 | X 46 | X 52 | X 56          | X 60                                                         | 46.57 – 155.15  |
| 12 3/4                      | 323.9               | 7.9 – 25.4     | A                            | B | X 42 | X 46 | X 52 | X 56          | X 60                                                         | 61.56 – 186.97  |
| 14                          | 355.6               | 8.7 – 25.4     | A                            | B | X 42 | X 46 | X 52 | X 56          | X 60                                                         | 74.42 – 206.83  |
| 16                          | 406.4               | 20.62 – 40.49  | A                            | B | X 42 | X 46 | X 52 | X 56          | X 60                                                         | 196.16 – 365.35 |
|                             |                     |                |                              |   |      |      |      |               |                                                              |                 |
|                             | Vyrábíme po dohodě. |                | Special agreement necessary. |   |      |      |      |               | Wir fertigen im begrenzten Umfang und nur nach Vereinbarung. |                 |

Od roku 1927 jsme oprávněni užívat monogram API při výrobě a značení trubek Casing a Line Pipe.

We have been licensed with API monogram in manufacturing and marking procedure of Casing, Couplings and Line Pipe since 1927.

Seit 1927 sind wir berechtigt, bei der Fertigung und Kennzeichnung der Casing und Line-Pipe-Rohre des Monogram von API zu verwenden.



## ÚPRAVA KONCŮ TRUBEK

Konce trubek jsou odříznuty za studena kolmo k podélné ose trubky. Po dohodě lze dodávat trubky s úkosal pro „V“ svar, kalibrované konce, konce řezané za tepla nebo neřezané konce.

Trubky s úkosy pro „V“ svar mohou být dodávány pro vnější průměry od 168 mm (včetně) dle následujících norem:

| API 5 L     |
|-------------|
| ASTM A 106  |
| ASTM A 53   |
| EN 10208-2  |
| EN 10216-1  |
| EN 10216-2  |
| EN 10216-3  |
| EN 10216-4  |
| EN 10297-1  |
| NF A 49-211 |

Trubky s vnějším průměrem menším než 168 mm mohou být dodávány s úkosy pro „V“ svar bez záruky čelní plošky s úhlem 30° (+ 5°/– 0°).

## FINISHING OF TUBE ENDS

Tube ends are cold cut perpendicular to longitudinal axis of tube. After special agreement it is possible to supply tubes with bevelled ends for „V“ weld, sized ends, hot cut ends or non-cut ends.

Tubes with bevelled ends for „V“ weld, with outside diameter from 168 mm (including), can be supplied according to the following standards:

| API 5 L     |
|-------------|
| ASTM A 106  |
| ASTM A 53   |
| EN 10208-2  |
| EN 10216-1  |
| EN 10216-2  |
| EN 10216-3  |
| EN 10216-4  |
| EN 10297-1  |
| NF A 49-211 |

Tubes with outside diameter, less than 168 mm, can be delivered with bevelled ends for „V“ weld without assurance of root face and with angle 30° (+ 5°/– 0°).

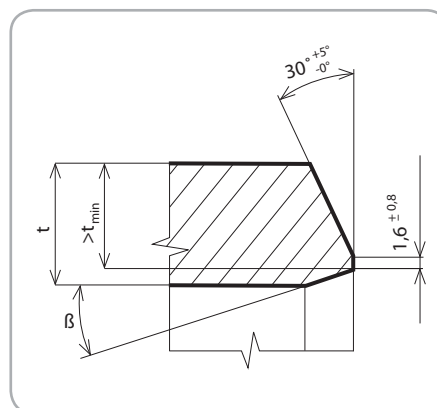
## BEHANDLUNG VON ROHRENDEN

Die Rohrenden sind im kalten Zustand senkrecht zur Rohrlängsachse abgeschnitten. Nach Vereinbarung können die Rohre mit Schrägen für „V“ Schweißnaht, mit kalibrierten, warmgeschnittenen oder mit nicht geschnittenen Enden geliefert werden.

Die Rohre mit abgeschrägten Enden können für Außendurchmesser von 168 mm nach den nachfolgenden Normen geliefert werden:

| API 5 L     |
|-------------|
| ASTM A 106  |
| ASTM A 53   |
| EN 10208-2  |
| EN 10216-1  |
| EN 10216-2  |
| EN 10216-3  |
| EN 10216-4  |
| EN 10297-1  |
| NF A 49-211 |

Die Rohre mit abgeschrägten Enden können für Außendurchmesser unter 168 mm ohne Garantie der Stirnfläche mit dem Winkel 30° (+ 5°/– 0°).





|                                              |                                         |                                         |
|----------------------------------------------|-----------------------------------------|-----------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM       | SEAMLESS STEEL TUBES PRODUCTION PROGRAM | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |
| TRUBKY PRO TĚŽBU NAFTY, ZEMNÍHO PLYNU A VODY | OIL COUNTRY TUBULAR GOODS               | NAHTLOSE ÖLFELDROHRE                    |
| Úprava konců trubek                          | Finishing of Tube Ends                  | Behandlung der Rohrenden                |

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| ÚKOSY            |        |                | SLANTS                                                                                                                                                            | ANLAUF |
|------------------|--------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                  |        |                |                                                                                                                                                                   |        |
| Vnější průměr    |        | Tloušťka stěny | Monogram API                                                                                                                                                      |        |
| Outside diameter |        | Wall thickness | API Monogram                                                                                                                                                      |        |
| Außendurchmesser |        | Wanddicke      | Monogramm API                                                                                                                                                     |        |
| inch             | mm     | mm             |                                                                                                                                                                   |        |
| 6,625            | 168,3  | 6,35           | S Monogramem API.<br>With API Monogram.<br>Mit Monogramm API.                                                                                                     |        |
|                  |        | 7,11           |                                                                                                                                                                   |        |
|                  |        | 7,92           |                                                                                                                                                                   |        |
|                  |        | 8,74           |                                                                                                                                                                   |        |
|                  |        | 9,53           |                                                                                                                                                                   |        |
|                  |        | 10,97          |                                                                                                                                                                   |        |
|                  |        | 12,7           |                                                                                                                                                                   |        |
|                  |        | 14,27          |                                                                                                                                                                   |        |
|                  |        | 15,88          | Bez kalibrace konců trubek; bez Monogramu API.<br>Without calibration of tube ends; without API Monogram.<br>Ohne Kalibrierung der Rohrenden; ohne API Monogramm. |        |
|                  |        | 18,26          |                                                                                                                                                                   |        |
|                  |        | 19,05          |                                                                                                                                                                   |        |
|                  |        | 21,95          |                                                                                                                                                                   |        |
|                  |        | 22,23          |                                                                                                                                                                   |        |
|                  |        | >25 ≤ 40       | S Monogramem API.<br>With API Monogram.<br>Mit Monogramm API.                                                                                                     |        |
| 8,625            | 219,1  | 6,35           |                                                                                                                                                                   |        |
|                  |        | 7,04           |                                                                                                                                                                   |        |
|                  |        | 7,92           |                                                                                                                                                                   |        |
|                  |        | 8,18           |                                                                                                                                                                   |        |
|                  |        | 8,74           |                                                                                                                                                                   |        |
|                  |        | 9,53           |                                                                                                                                                                   |        |
|                  |        | 10,31          |                                                                                                                                                                   |        |
|                  |        | 11,13          |                                                                                                                                                                   |        |
|                  |        | 12,7           |                                                                                                                                                                   |        |
|                  |        | 14,27          |                                                                                                                                                                   |        |
|                  |        | 15,09          |                                                                                                                                                                   |        |
|                  |        | 15,88          |                                                                                                                                                                   |        |
|                  |        | 18,26          |                                                                                                                                                                   |        |
|                  |        | 19,05          |                                                                                                                                                                   |        |
|                  |        | 20,62          |                                                                                                                                                                   |        |
|                  |        | 22,23          | Bez kalibrace konců trubek; bez Monogramu API.<br>Without calibration of tube ends; without API Monogram.<br>Ohne Kalibrierung der Rohrenden; ohne API Monogramm. |        |
|                  |        | 23,01          |                                                                                                                                                                   |        |
| 9 5/8            | 244,48 | 25,4           | S Monogramem API.<br>With API Monogram.<br>Mit Monogramm API.                                                                                                     |        |
|                  |        | ≤ 40           |                                                                                                                                                                   |        |
|                  |        | 7,92           |                                                                                                                                                                   |        |
|                  |        | 8,94           |                                                                                                                                                                   |        |
|                  |        | 10,03          |                                                                                                                                                                   |        |
|                  |        | 11,05          |                                                                                                                                                                   |        |
|                  |        | 11,99          |                                                                                                                                                                   |        |
|                  |        | 13,84          |                                                                                                                                                                   |        |
|                  |        | 15,11          |                                                                                                                                                                   |        |
|                  |        | ≤ 25           | Bez kalibrace konců trubek; bez Monogramu API.<br>Without calibration of tube ends; without API Monogram.<br>Ohne Kalibrierung der Rohrenden; ohne API Monogramm. |        |
|                  |        | >25 ≤ 40       |                                                                                                                                                                   |        |

|                                              |                                         |                                         |                                                                                    |
|----------------------------------------------|-----------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM       | SEAMLESS STEEL TUBES PRODUCTION PROGRAM | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |  |
| TRUBKY PRO TĚŽBU NAFTY, ZEMNÍHO PLYNU A VODY | OIL COUNTRY TUBULAR GOODS               | NAHTLOSE ÖLFELDROHRE                    |                                                                                    |
| Úprava konců trubek                          | Finishing of Tube Ends                  | Behandlung der Rohrenden                |                                                                                    |

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| Vnější průměr    |        | Tloušťka stěny | Monogram API                                                  |
|------------------|--------|----------------|---------------------------------------------------------------|
| Outside diameter |        | Wall thickness | API Monogram                                                  |
| Außendurchmesser |        | Wanddicke      | Monogramm API                                                 |
| inch             | mm     | mm             |                                                               |
| 10,75            | 273    | 6,35           | S monogramem API.<br>With API Monogram.<br>Mit Monogramm API. |
|                  |        | 7,09           |                                                               |
|                  |        | 7,8            |                                                               |
|                  |        | 8,74           |                                                               |
|                  |        | 9,27           |                                                               |
|                  |        | 11,13          |                                                               |
|                  |        | 12,7           |                                                               |
|                  |        | 14,27          |                                                               |
|                  |        | 15,09          |                                                               |
|                  |        | 15,88          |                                                               |
|                  |        | 18,26          |                                                               |
|                  |        | 20,62          |                                                               |
|                  |        | 21,44          |                                                               |
|                  |        | 22,23          |                                                               |
|                  |        | 23,83          |                                                               |
| 10 3/4           | 273,05 | 25,4           | S Monogramem API.<br>With API Monogram.<br>Mit Monogramm API. |
|                  |        | 28,58          |                                                               |
|                  |        | 8,89           |                                                               |
|                  |        | 10,16          |                                                               |
|                  |        | 11,43          |                                                               |
|                  |        | 12,57          |                                                               |
|                  |        | 13,84          |                                                               |
|                  |        | 15,11          |                                                               |
|                  |        | ≤ 25           |                                                               |
|                  |        | >25 ≤ 40       |                                                               |
| 11 3/4           | 298,45 | 8,46           | S Monogramem API.<br>With API Monogram.<br>Mit Monogramm API. |
|                  |        | 9,53           |                                                               |
|                  |        | 11,05          |                                                               |
|                  |        | 12,42          |                                                               |
|                  |        | ≤ 25           |                                                               |
|                  |        | >25 ≤ 45       |                                                               |

| POZNÁMKA                                                                                                                                                              | NOTICE                                                                                                                                                                                              | VERMERK                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Se zákazníkem může být domluven i jiný tvar úkosu než API a trubky se mohou dodávat s monogramem API, pokud budou kalibrované konce trubek do tloušťky stěny ≤ 25 mm. | It is possible to agree on a different type of bevelled end other than according to API provided wall thickness of tube ends does not exceed 25 mm. Tubes will still be supplied with API Monogram. | Mit dem Kunden kann auch andere Form der Abschrägung als API vereinbart werden und die Rohre können mit dem Monogramm API geliefert werden, wenn die Wanddicke der kalibrierten Enden bis ≤ 25mm dick ist. |
| Minimální délka trubky musí být 4,3 m.                                                                                                                                | Minimum length of tube needs to be 4,3 m.                                                                                                                                                           | Das Rohr muss min. 4,3m lang sein.                                                                                                                                                                         |

| Tloušťka stěny |             |             |        | Wall thickness |             |             |        | Wanddicke        |             |             |        |
|----------------|-------------|-------------|--------|----------------|-------------|-------------|--------|------------------|-------------|-------------|--------|
| t (mm)         |             |             |        | t (mm)         |             |             |        | t (mm)           |             |             |        |
| < 10.5         | 10.5 – 14.0 | 14.1 – 17.0 | > 17.0 | < 10.5         | 10.5 – 14.0 | 14.1 – 17.0 | > 17.0 | < 10.5           | 10.5 – 14.0 | 14.1 – 17.0 | > 17.0 |
| Vnitřní úkos   |             |             |        | Internal bevel |             |             |        | Innenabschrägung |             |             |        |
| max. β         |             |             |        | max. β         |             |             |        | max. β           |             |             |        |
| 7°             | 9.5°        | 11°         | 14°    | 7°             | 9.5°        | 11°         | 14°    | 7°               | 9.5°        | 11°         | 14°    |





|                                              |                                         |                                         |
|----------------------------------------------|-----------------------------------------|-----------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM       | SEAMLESS STEEL TUBES PRODUCTION PROGRAM | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |
| TRUBKY PRO TĚŽBU NAFTY, ZEMNÍHO PLYNU A VODY | OIL COUNTRY TUBULAR GOODS               | NAHTLOSE ÖLFELDROHRE                    |
| Úprava konců trubek                          | Finishing of Tube Ends                  | Behandlung der Rohrenden                |

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| Vnější průměr    |        | TLoušťka stěny | Monogram API                                                                                                                                                      |
|------------------|--------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Outside diameter |        | Wall thickness | API Monogram                                                                                                                                                      |
| Außendurchmesser |        | Wanddicke      | Monogramm API                                                                                                                                                     |
| inch             | mm     | mm             |                                                                                                                                                                   |
| 12,75            | 323,8  | 6,35           | S Monogramem API.<br>With API Monogram.<br>Mit Monogramm API.                                                                                                     |
|                  |        | 7,14           |                                                                                                                                                                   |
|                  |        | 7,92           |                                                                                                                                                                   |
|                  |        | 8,38           |                                                                                                                                                                   |
|                  |        | 8,74           |                                                                                                                                                                   |
|                  |        | 9,53           |                                                                                                                                                                   |
|                  |        | 10,31          |                                                                                                                                                                   |
|                  |        | 11,13          |                                                                                                                                                                   |
|                  |        | 12,7           |                                                                                                                                                                   |
|                  |        | 14,27          |                                                                                                                                                                   |
|                  |        | 15,88          |                                                                                                                                                                   |
|                  |        | 17,48          |                                                                                                                                                                   |
|                  |        | 19,05          |                                                                                                                                                                   |
|                  |        | 20,62          |                                                                                                                                                                   |
|                  |        | 21,44          |                                                                                                                                                                   |
|                  |        | 22,23          |                                                                                                                                                                   |
| 13 3/8           | 339,72 | 23,83          | Bez kalibrace konců trubek; bez Monogramu API.<br>Without calibration of tube ends; without API Monogram.<br>Ohne Kalibrierung der Rohrenden; ohne API Monogramm. |
|                  |        | 25,4           | S Monogramem API.<br>With API Monogram.<br>Mit Monogramm API.                                                                                                     |
|                  |        | 26,97          |                                                                                                                                                                   |
|                  |        | 28,58          |                                                                                                                                                                   |
|                  |        | 31,75          |                                                                                                                                                                   |
|                  |        | 33,32          |                                                                                                                                                                   |
|                  |        | ≤ 45           |                                                                                                                                                                   |
|                  |        | 8,38           |                                                                                                                                                                   |
|                  |        | 9,65           |                                                                                                                                                                   |
|                  |        | 10,92          |                                                                                                                                                                   |
| 14               | 355,6  | 12,19          | S Monogramem API.<br>With API Monogram.<br>Mit Monogramm API.                                                                                                     |
|                  |        | 13,06          |                                                                                                                                                                   |
|                  |        | ≤ 25           |                                                                                                                                                                   |
|                  |        | >25 ≤ 45       | S Monogramem API.<br>With API Monogram.<br>Mit Monogramm API.                                                                                                     |
|                  |        | 9,53           |                                                                                                                                                                   |
|                  |        | 10,31          |                                                                                                                                                                   |
|                  |        | 11,13          |                                                                                                                                                                   |
|                  |        | 11,91          |                                                                                                                                                                   |
|                  |        | 12,7           |                                                                                                                                                                   |
|                  |        | 14,27          |                                                                                                                                                                   |
|                  |        | 15,09          |                                                                                                                                                                   |
|                  |        | 15,88          |                                                                                                                                                                   |
|                  |        | 17,48          |                                                                                                                                                                   |
|                  |        | 19,05          |                                                                                                                                                                   |
|                  |        | 20,62          |                                                                                                                                                                   |
|                  |        | 22,23          |                                                                                                                                                                   |
|                  |        | 23,83          |                                                                                                                                                                   |
|                  |        | 25,4           |                                                                                                                                                                   |
| 16               | 406,4  | 26,97          | S Monogramem API.<br>With API Monogram.<br>Mit Monogramm API.                                                                                                     |
|                  |        | 27,79          |                                                                                                                                                                   |
|                  |        | 28,58          |                                                                                                                                                                   |
|                  |        | 31,75          |                                                                                                                                                                   |
|                  |        | 35,71          |                                                                                                                                                                   |
|                  |        | ≤ 45           |                                                                                                                                                                   |
|                  |        | 20,62          | Bez kalibrace konců trubek; bez Monogramu API.<br>Without calibration of tube ends; without API Monogram.<br>Ohne Kalibrierung der Rohrenden; ohne API Monogramm. |
|                  |        | 21,44          |                                                                                                                                                                   |
|                  |        | 22,23          |                                                                                                                                                                   |
|                  |        | 23,83          |                                                                                                                                                                   |
|                  |        | 25,4           | S Monogramem API.<br>With API Monogram.<br>Mit Monogramm API.                                                                                                     |
|                  |        | 26,19          |                                                                                                                                                                   |
|                  |        | 26,97          |                                                                                                                                                                   |
|                  |        | 28,58          |                                                                                                                                                                   |
|                  |        | 30,18          |                                                                                                                                                                   |
|                  |        | 30,96          |                                                                                                                                                                   |
|                  |        | 31,75          |                                                                                                                                                                   |
|                  |        | 36,53          |                                                                                                                                                                   |
|                  |        | 40,49          |                                                                                                                                                                   |
|                  |        | ≤ 45           |                                                                                                                                                                   |

|                                              |                                         |                                         |                                                                                    |
|----------------------------------------------|-----------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM       | SEAMLESS STEEL TUBES PRODUCTION PROGRAM | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |  |
| TRUBKY PRO TĚŽBU NAFTY, ZEMNÍHO PLYNU A VODY | OIL COUNTRY TUBULAR GOODS               | NAHTLOSE ÖLFELDROHRE                    |                                                                                    |
| Úprava konců trubek                          | Finishing of Tube Ends                  | Behandlung der Rohrenden                |                                                                                    |

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| Vnější průměr    |       | Tloušťka stěny | Monogram API                                                                                                                                                                                                                                                                                   |
|------------------|-------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Outside diameter |       | Wall thickness | API Monogram                                                                                                                                                                                                                                                                                   |
| Außendurchmesser |       | Wanddicke      | Monogramm API                                                                                                                                                                                                                                                                                  |
| inch             | mm    | mm             |                                                                                                                                                                                                                                                                                                |
| 2,875            | 73    | 6,35           | <div>Se zaručenou šířkou čelní plošky; bez kalibrace konců a bez Monogramu API.</div> <div>With guaranteed root face; without calibration of tube ends and without API Monogram.</div> <div>Mit garantierter Breite der Stirnfläche; ohne Kalibrierung der Enden und ohne API Monogramm.</div> |
|                  |       | 7,01           |                                                                                                                                                                                                                                                                                                |
| 3,5              | 88,9  | 6,35           |                                                                                                                                                                                                                                                                                                |
|                  |       | 7,14           |                                                                                                                                                                                                                                                                                                |
|                  |       | 7,62           |                                                                                                                                                                                                                                                                                                |
|                  |       | 11,13          |                                                                                                                                                                                                                                                                                                |
|                  |       | 6,35           |                                                                                                                                                                                                                                                                                                |
| 4                | 101,6 | 7,14           |                                                                                                                                                                                                                                                                                                |
|                  |       | 8,08           |                                                                                                                                                                                                                                                                                                |
|                  |       | 6,02           |                                                                                                                                                                                                                                                                                                |
| 4,5              | 114,3 | 6,35           |                                                                                                                                                                                                                                                                                                |
|                  |       | 7,14           |                                                                                                                                                                                                                                                                                                |
|                  |       | 7,92           |                                                                                                                                                                                                                                                                                                |
|                  |       | 8,56           |                                                                                                                                                                                                                                                                                                |
|                  |       | 11,13          |                                                                                                                                                                                                                                                                                                |
|                  |       | 13,49          |                                                                                                                                                                                                                                                                                                |
|                  |       | 17,12          |                                                                                                                                                                                                                                                                                                |
| 5,563            | 141,3 | 6,55           |                                                                                                                                                                                                                                                                                                |
|                  |       | 7,14           |                                                                                                                                                                                                                                                                                                |
|                  |       | 7,92           |                                                                                                                                                                                                                                                                                                |
|                  |       | 8,74           |                                                                                                                                                                                                                                                                                                |
|                  |       | 9,53           |                                                                                                                                                                                                                                                                                                |
|                  |       | 12,70          |                                                                                                                                                                                                                                                                                                |
|                  |       | 15,88          |                                                                                                                                                                                                                                                                                                |
| 6,625            | 168,3 | 19,05          |                                                                                                                                                                                                                                                                                                |
|                  |       | 6,35           |                                                                                                                                                                                                                                                                                                |
|                  |       | 7,11           |                                                                                                                                                                                                                                                                                                |
|                  |       | 7,92           |                                                                                                                                                                                                                                                                                                |
|                  |       | 8,74           |                                                                                                                                                                                                                                                                                                |
|                  |       | 9,53           |                                                                                                                                                                                                                                                                                                |
|                  |       | 10,97          |                                                                                                                                                                                                                                                                                                |
|                  |       | 12,70          |                                                                                                                                                                                                                                                                                                |
|                  |       | 14,27          |                                                                                                                                                                                                                                                                                                |
|                  |       | 15,88          |                                                                                                                                                                                                                                                                                                |
|                  |       | 18,26          |                                                                                                                                                                                                                                                                                                |
|                  |       | 19,05          |                                                                                                                                                                                                                                                                                                |

| POZNÁMKA |                                                                                                                                                                       | NOTICE |                                                                                                                                                                                                     | VERMERK |                                                                                                                                                                                                            |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | Se zákazníkem může být domluven i jiný tvar úkosu než API a trubky se mohou dodávat s monogramem API, pokud budou kalibrované konce trubek do tloušťky stěny ≤ 25 mm. |        | It is possible to agree on a different type of bevelled end other than according to API provided wall thickness of tube ends does not exceed 25 mm. Tubes will still be supplied with API Monogram. |         | Mit dem Kunden kann auch andere Form der Abschrägung als API vereinbart werden und die Rohre können mit dem Monogramm API geliefert werden, wenn die Wanddicke der kalibrierten Enden bis ≤ 25mm dick ist. |
|          | Minimální délka trubky musí být 4,3 m.                                                                                                                                |        | Minimum length of tube needs to be 4,3 m.                                                                                                                                                           |         | Das Rohr muss min. 4,3m lang sein.                                                                                                                                                                         |

| Tloušťka stěny |             |             |        | Wall thickness |             |             |        | Wanddicke        |             |             |        |
|----------------|-------------|-------------|--------|----------------|-------------|-------------|--------|------------------|-------------|-------------|--------|
| t (mm)         |             |             |        | t (mm)         |             |             |        | t (mm)           |             |             |        |
| < 10.5         | 10.5 – 14.0 | 14.1 – 17.0 | > 17.0 | < 10.5         | 10.5 – 14.0 | 14.1 – 17.0 | > 17.0 | < 10.5           | 10.5 – 14.0 | 14.1 – 17.0 | > 17.0 |
| Vnitřní úkos   |             |             |        | Internal bevel |             |             |        | Innenabschrägung |             |             |        |
| max. β         |             |             |        | max. β         |             |             |        | max. β           |             |             |        |
| 7°             | 9.5°        | 11°         | 14°    | 7°             | 9.5°        | 11°         | 14°    | 7°               | 9.5°        | 11°         | 14°    |



|                                                                  |                                                 |                                         |
|------------------------------------------------------------------|-------------------------------------------------|-----------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM                           | SEAMLESS STEEL TUBES PRODUCTION PROGRAM         | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM |
| NEDESTRUKTIVNÍ ZKOUŠENÍ                                          | NON DESTRUCTIVE TESTING                         | ZERSTÖRUNGSFREIE PRÜFUNG                |
| Seznam běžně používaných norem a standardních zkušebních postupů | List of standards and standard practices in use | Parameter der Defektoskopieanlage       |

| NEDESTRUKTIVNÍ ZKOUŠENÍ                                                                                                                                | NON DESTRUCTIVE TESTING                                                                                                                                       | ZERSTÖRUNGSFREIE PRÜFUNG                                                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seznam běžně používaných norem a standardních zkušebních postupů                                                                                       | List of standards and standard practices in use                                                                                                               | Parameter der Defektoskopieanlage                                                                                                                                                                        |
| ASTM E 709                                                                                                                                             |                                                                                                                                                               |                                                                                                                                                                                                          |
| Standardní směrnice pro zkoušku magnetickými částicemi                                                                                                 | Standard guide for magnetic particle examination                                                                                                              | Standardrichtlinie für Magnetpulverprüfung                                                                                                                                                               |
| ČSN 01 5015                                                                                                                                            |                                                                                                                                                               |                                                                                                                                                                                                          |
| Zkoušení materiálu a výrobků magnetickou práškovou metodou                                                                                             | Magnetic particle inspection of material and products                                                                                                         | Werkstoff- und Produktprüfungen durch Magnetpulverprüfung                                                                                                                                                |
| EN 10246-12                                                                                                                                            |                                                                                                                                                               |                                                                                                                                                                                                          |
| Zkoušení bezešvých a svařovaných trubek z feromagnetických ocelí pro zjišťování povrchových necelistvostí magnetickou metodou práškovou                | Magnetic particle inspection of seamless and welded ferromagnetic steel tubes for the detection of surface imperfections                                      | Magnetpulverprüfung der nahtlosen und geschweißten Stahlrohre aus ferromagnetischen Stählen zum Nachweis von Oberflächenfehlern                                                                          |
| EN 10 246 – 6                                                                                                                                          |                                                                                                                                                               |                                                                                                                                                                                                          |
| Automatické zkoušení bezešvých ocelových trubek pro zjišťování příčných necelistvostí ultrazvukem                                                      | Automatic full peripheral ultrasonic testing of seamless steel tubes for the detection of transverse imperfections                                            | Automatisches Ultraschallprüfen der nahtlosen Stahlrohre zum Feststellen von Querfehlern                                                                                                                 |
| EN 10 246 – 7                                                                                                                                          |                                                                                                                                                               |                                                                                                                                                                                                          |
| Automatické zkoušení bezešvých a svařovaných ocelových trubek (kromě svařovaných pod tavidlem) pro zjišťování podélných necelistvostí ultrazvukem      | Automatic full peripheral ultrasonic testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of longitudinal imperfections | Automatisches Ultraschallprüfen der nahtlosen und geschweißten Stahlrohre (außer den durch die Unterpulverschweißung geschweißten Rohren) zum Feststellen von länglichen Unkompaktheiten                 |
| EN 10 246 – 13                                                                                                                                         |                                                                                                                                                               |                                                                                                                                                                                                          |
| Automatické zkoušení tloušťky bezešvých a svařovaných ocelových trubek (kromě svařovaných pod tavidlem) ultrazvukem                                    | Automatic full peripheral ultrasonic thickness testing of seamless and welded (except submerged arc-welded) steel tubes                                       | Automatisches Ultraschallprüfen der Wanddicke bei nahtlosen und geschweißten Stahlrohren (ausser den durch Unterpulverschweißung geschweißten Rohren)                                                    |
| EN 10 246 – 14                                                                                                                                         |                                                                                                                                                               |                                                                                                                                                                                                          |
| Automatické zkoušení bezešvých ocelových trubek (kromě svařovaných pod tavidlem) pro zjišťování dvojítloušťky ultrazvukem                              | Automatic full peripheral ultrasonic testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of laminar imperfections      | Automatisches Ultraschallprüfen der nahtlosen Stahlrohre (außer den durch die Unterpulverschweißung geschweißten Rohren) zum Feststellen von Dopplungen                                                  |
| SEP 1915                                                                                                                                               |                                                                                                                                                               |                                                                                                                                                                                                          |
| Ultrazvuková zkouška ocelových trubek na podélné vady                                                                                                  | Ultrasonic inspection of steel pipes for detection of longitudinal defects                                                                                    | Ultraschallprüfung von Stahlrohren auf Längsfehler                                                                                                                                                       |
| SEP 1918                                                                                                                                               |                                                                                                                                                               |                                                                                                                                                                                                          |
| Ultrazvuková zkouška ocelových trubek na příčné vady                                                                                                   | Ultrasonic inspection of steel pipes for detection transversal defects                                                                                        | Ultraschallprüfung von Stahlrohren auf Querfehler                                                                                                                                                        |
| SEP 1919                                                                                                                                               |                                                                                                                                                               |                                                                                                                                                                                                          |
| Ultrazvuková zkouška trubek ze žároveňových ocelí na dvojítloušťky                                                                                     | Ultrasonic inspection of heat resistant steel pipe for detection of laminations defects                                                                       | Ultraschallprüfung auf Dopplungen von Rohren aus warmfesten Stählen                                                                                                                                      |
| ČSN 01 5028                                                                                                                                            |                                                                                                                                                               |                                                                                                                                                                                                          |
| Zkoušení ocelových bezešvých trubek ultrazvukem                                                                                                        | Ultrasonic inspection of seamless steel pipe                                                                                                                  | Prüfung von nahtlosen Stahlrohren mit Ultraschall                                                                                                                                                        |
| EN 10 246 – 1                                                                                                                                          |                                                                                                                                                               |                                                                                                                                                                                                          |
| Automatické elektromagnetické zkoušení bezešvých a svařovaných trubek (kromě svařovaných pod tavidlem) z feromagnetických ocelí pro ověřování těsnosti | Automatic electromagnetic testing of seamless and welded (except submerged arc-welded) ferromagnetic steel tubes for verification of hydraulic leak-tightness | Automatische elektromagnetische Prüfung von nahtlosen und geschweißten Rohren (außer den durch die Unterpulverschweißung geschweißten Rohren) aus Ferromagnetischen Stählen zum Überprüfen der Dichtheit |

|                                        |                                         |                                          |                                                                                    |
|----------------------------------------|-----------------------------------------|------------------------------------------|------------------------------------------------------------------------------------|
| OCELOVÉ BEZEŠVÉ TRUBKY VÝROBNÍ PROGRAM | SEAMLESS STEEL TUBES PRODUCTION PROGRAM | NAHTLOSE STAHLROHRE PRODUKTIONSPROGRAMM  |  |
| NEDESTRUKTIVNÍ ZKOUŠENÍ                | NON DESTRUCTIVE TESTING                 | ZERSTÖRUNGSFREIE PRÜFUNG                 |                                                                                    |
| Parametry nedestruktivních linek       | Non destructive testing device list     | Parameter der zerstörungsfreien Strassen |                                                                                    |

| EN 10 246 – 5                                                                                                                                                                       |                                                                                                                                                                                                    |                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Automatické zkoušení bezešvých a svařovaných trubek (kromě svařovaných pod tavídkem) z feromagnetických ocelí pro zjišťování podélných necelistvostí magnetickými rozptylovými toky | Automatic full peripheral magnetic transducer/ flux leakage testing of seamless and welded (except submerged arc-welded) ferromagnetic steel tubes for the detection of longitudinal imperfections | Automatisches Streuflussprüfungen von nahtlosen und geschweißten Rohren (außer den durch die Unterpulverschweißung geschweißten Rohren) aus Ferromagnetischen Stählen zum Feststellen von länglichen Unkompaktheiten |
| ASTM E 213                                                                                                                                                                          |                                                                                                                                                                                                    |                                                                                                                                                                                                                      |
| Standardní postup pro zkoušení ocelových trubek ultrazvukem                                                                                                                         | Standard practice for ultrasonic examination of metal pipe and tubing                                                                                                                              | Standardvorgang zum Ultraschallprüfen von Stahlrohren                                                                                                                                                                |
| ASTM E 570                                                                                                                                                                          |                                                                                                                                                                                                    |                                                                                                                                                                                                                      |
| Standardní postup pro zkoušení ocelových trubkových výrobků rozptylovými toky                                                                                                       | Standard practice for flux leakage examination of Ferromagnetic Steel tubular products                                                                                                             | Standardvorgang für das Streuflussprüfen von Stahlrohrprodukten                                                                                                                                                      |
| ČSN 01 5047                                                                                                                                                                         |                                                                                                                                                                                                    |                                                                                                                                                                                                                      |
| Zkoušení ocelových trubek metodou magnetických rozptylových toků                                                                                                                    | Flux leakage examination of steel pipe                                                                                                                                                             | Prüfen von Stahlrohren durch das magnetische Streuflussverfahren                                                                                                                                                     |
| ČSN 01 5049                                                                                                                                                                         |                                                                                                                                                                                                    |                                                                                                                                                                                                                      |
| Zjišťování nepropustnosti trubek elektromagnetickými metodami                                                                                                                       | Tightness statement with electromagnetic method                                                                                                                                                    | Ermittlung der Undurchlässigkeit von Rohren mittels elektromagnetischer Verfahren                                                                                                                                    |
| SEP 1925                                                                                                                                                                            |                                                                                                                                                                                                    |                                                                                                                                                                                                                      |
| Elektromagnetická zkouška trubek k prokázání těsnosti                                                                                                                               | Electromagnetic inspection of pipe for tightness determination                                                                                                                                     | Elektromagnetische Prüfung von Rohren zum Nachweis der Dichtheit                                                                                                                                                     |

| PARAMETRY NEDESTRUKTIVNÍCH LINEK |                   | NON DESTRUCTIVE TESTING DEVICE LIST            | PARAMETER DER ZERSTÖRUNGSFREIEN STRASSEN                                                                                                                     |
|----------------------------------|-------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rozsah průměrů                   | Rozsah délek      | Zkušební metoda                                | Norma                                                                                                                                                        |
| Dimension range                  | Length range      | Testing method                                 | Standard                                                                                                                                                     |
| Umfang von Durchmessern          | Umfang von Längen | Prüfverfahren                                  | Norm                                                                                                                                                         |
| (mm)                             | (m)               |                                                |                                                                                                                                                              |
| 60,3 – 406,4                     | 3,6 – 12,0        | Ultrazvuk<br>Ultrasonic<br>Ultraschall         | ASTM E 213<br>ČSN 01 5028.2<br>ČSN 01 5028.3<br>ČSN 01 5028.4<br>EN 10246-13<br>EN 10 246-14<br>EN 10246-6<br>EN 10246-7<br>SEP 1915<br>SEP 1918<br>SEP 1919 |
| 60,3 – 406,4                     | 3,6 – 12,0        | Rozptylové toky<br>Flux leakage<br>Streuflüsse | ASTM E 570<br>ČSN 01 5047<br>ČSN 01 5049<br>EN 10 246-5<br>EN 10246-1<br>SEP 1925                                                                            |

| POZNÁMKA                                                                       | NOTICE                                                                            | VERMERK                                                                                     |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Nedestruktivní zkoušení je ve všech uvedených metodách certifikováno TÜV NORD. | TÜV NORD has approved all the above non-destructive testing methods.              | Zerstörungsfreie Prüfungen sind in allen angeführten Verfahren durch TÜV NORD zertifiziert. |
| Pro provedení NDT zkoušky je nutno zachovat $t/D \leq 0,17$ .                  | In order to carry out NDT testing, the ration $t/D \leq 0,17$ must be maintained. | Zerstörungsfreie Prüfung möglich nur mit Teilwert $t/D \leq 0,17$ .                         |



|                                                       |                                                                           |                                                               |
|-------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------|
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| CERTIFIKACE VÝROBKŮ                                   | PRODUCTS CERTIFICATION                                                    | ZERTIFIKATION PRODUKTEN                                       |
| Dle ES 97/23/EG<br>Dle AD 2000-Merkblatt W4 a TRD 102 | According to ES 97/23/EG<br>According to AD 2000-Merkblatt W4 and TRD 102 | Gemäss ES 97/23/EG<br>Gemäss AD 2000-Merkblatt W4 und TRD 102 |

| CERTIFIKACE VÝROBKŮ                         |                               | PRODUCTS CERTIFICATION   |                 | ZERTIFIKATION PRODUKTEN |                          |   |
|---------------------------------------------|-------------------------------|--------------------------|-----------------|-------------------------|--------------------------|---|
| dle ES 97/23/EG                             |                               | according to ES 97/23/EG |                 | gemäss ES 97/23/EG      |                          |   |
|                                             |                               |                          |                 |                         |                          |   |
| Jakost                                      | Technické dodací podmínky     |                          | Stav dodání     |                         | Inspekční certifikát*)   |   |
| Grade                                       | Technical delivery conditions |                          | Delivery status |                         | Inspection certificate*) |   |
| Güte                                        | Technische Lieferbedingungen  |                          | Lieferstatus    |                         | Kontrollbescheinigung*)  |   |
|                                             |                               |                          |                 | 3.1                     | 3.2                      |   |
| P195TR2, P235TR2, P265TR2                   | EN 10216-1                    |                          | N               |                         | X                        | X |
| P195GH, P235GH, P265GH, 16Mo3               | EN 10216-2                    |                          | N               |                         | X                        | X |
| 13CrMo4-5, 10CrMo9-10, 14MoV6-3, 11CrMo9-10 | EN 10216-2                    |                          | NT, QT          |                         | X                        | X |
| X10CrMoVNb9-1                               | EN 10216-2                    |                          | NT, QT          |                         |                          | X |
| P275NL1, P355NL1, P355NH, P355N             | EN 10216-3                    |                          | N               |                         | X                        | X |
| Gr.A, Gr.B                                  | ASME SA 106                   |                          | N               |                         | X                        | X |
| Gr.C                                        | ASME SA 106                   |                          | N               |                         |                          | X |
| 15128                                       | ČSN 4115128                   |                          | NT, OT          |                         | X                        | X |

| POZNÁMKA                                                       | NOTICE                                                       | VERMERK                                                                       |
|----------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------|
| *) Pokud jsou zakřížkovány oba typy, je to na volbě zákazníka. | *) If both types are checked, it is up to customer's choice. | *) Wenn beide Typen angekreuzt sind, liegt es an der Entscheidung des Kunden. |
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| NT Normalizačně žíhaný a popuštěný.                            | NT Normalizing and tempering                                 | NT Normalisiert und angelassen.                                               |
| QT Zušlechtěný.                                                | QT Heat treatment.                                           | QT Veredelt.                                                                  |

| NAFTOVODNÉ TRUBKY LINE PIPE                 |                               | LINE PIPE                                     |             | LEITUNGSROHRE                           |                          |     |
|---------------------------------------------|-------------------------------|-----------------------------------------------|-------------|-----------------------------------------|--------------------------|-----|
| dle AD 2000-Merkblatt W4 a TRD 102          |                               | according to AD 2000-Merkblatt W4 and TRD 102 |             | gemäss AD 2000-Merkblatt W4 und TRD 102 |                          |     |
|                                             |                               |                                               |             |                                         |                          |     |
| Jakost                                      | Technické dodací podmínky     | Stav dodání                                   | Předpis     |                                         | Inspekční certifikát*)   |     |
| Grade                                       | Technical delivery conditions | Delivery status                               | Regulation  |                                         | Inspection certificate*) |     |
| Güte                                        | Technische Lieferbedingungen  | Lieferstatus                                  | Instruktion |                                         | Kontrollbescheinigung*)  |     |
|                                             |                               |                                               | ADW4        | TRD 102                                 | 3.1                      | 3.2 |
| P195TR2, P235TR2, P265TR2                   | EN 10216-1                    | N                                             | X           |                                         | X                        | X   |
| P195GH, P235GH, P265GH                      | EN 10216-2                    | N                                             | X           | X                                       | X                        | X   |
| 16Mo3                                       | EN 10216-2                    | N                                             | X           | X                                       |                          | X   |
| 13CrMo4-5, 10CrMo9-10, 14MoV6-3, 11CrMo9-10 | EN 10216-2                    | NT                                            | X           | X                                       |                          | X   |
|                                             |                               | QT                                            |             |                                         |                          |     |

| POZNÁMKA                                                       | NOTICE                                                       | VERMERK                                                                       |
|----------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------|
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| NT Normalizačně žíhaný a popuštěný.                            | NT Normalizing and tempering.                                | NT Normalisiert und angelassen.                                               |
| QT Zušlechtěný.                                                | QT Heat treatment.                                           | QT Veredelt.                                                                  |

|                                                            |                                                             |                                                          |
|------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------|
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|                                                                                     |                                                                                      |
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|    |    |
| Zkouška tahem                                                                       | Zkouška rázem v ohybu                                                                |
| Tensile test                                                                        | Impact bending test                                                                  |
| Zugversuch                                                                          | Kerbschlagbiegeversuch                                                               |
|  |  |
| Zkouška tvrdosti dle Brinella                                                       | Zkouška smáčknutím                                                                   |
| Brinell hardness test                                                               | Tube flattening test                                                                 |
| Brinell's Härteversuch                                                              | Quetschversuch                                                                       |
|  |  |
| Zkouška rozšiřováním prstence                                                       | Zkouška tahem prstence                                                               |
| Tube ring-expanding test                                                            | Tube ring tensile test                                                               |
| Ringaufweitversuch                                                                  | Ringzugversuch                                                                       |



|                                                                             |                                 |                                                                       |
|-----------------------------------------------------------------------------|---------------------------------|-----------------------------------------------------------------------|
| API Spec. 5 CT                                                              | API Spec. 5 CT                  | API Spec. 5 CT                                                        |
| API Spec. 5 L                                                               | API Spec. 5 L                   | API Spec. 5 L                                                         |
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| Certifikát technické způsobilosti nedestruktivní kontroly                   | NDT Certificate                 | Zertifikat der technischen Befähigung zur zerstörungsfreien Kontrolle |
| Certifikát o zavedení a používání systému managementu jakosti ISO 9001:2008 | We are ISO 9001:2008 certified  | Wir haben das ISO 9001:2008 Zertifikat                                |
| Certifikát CE                                                               | CE Certificate                  | CE Zertifikat                                                         |

|                                                              |                                                                                                   |
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