



## Delivery program

Carbon steel and stainless steel tubes  
in a wide range of qualities and dimensions

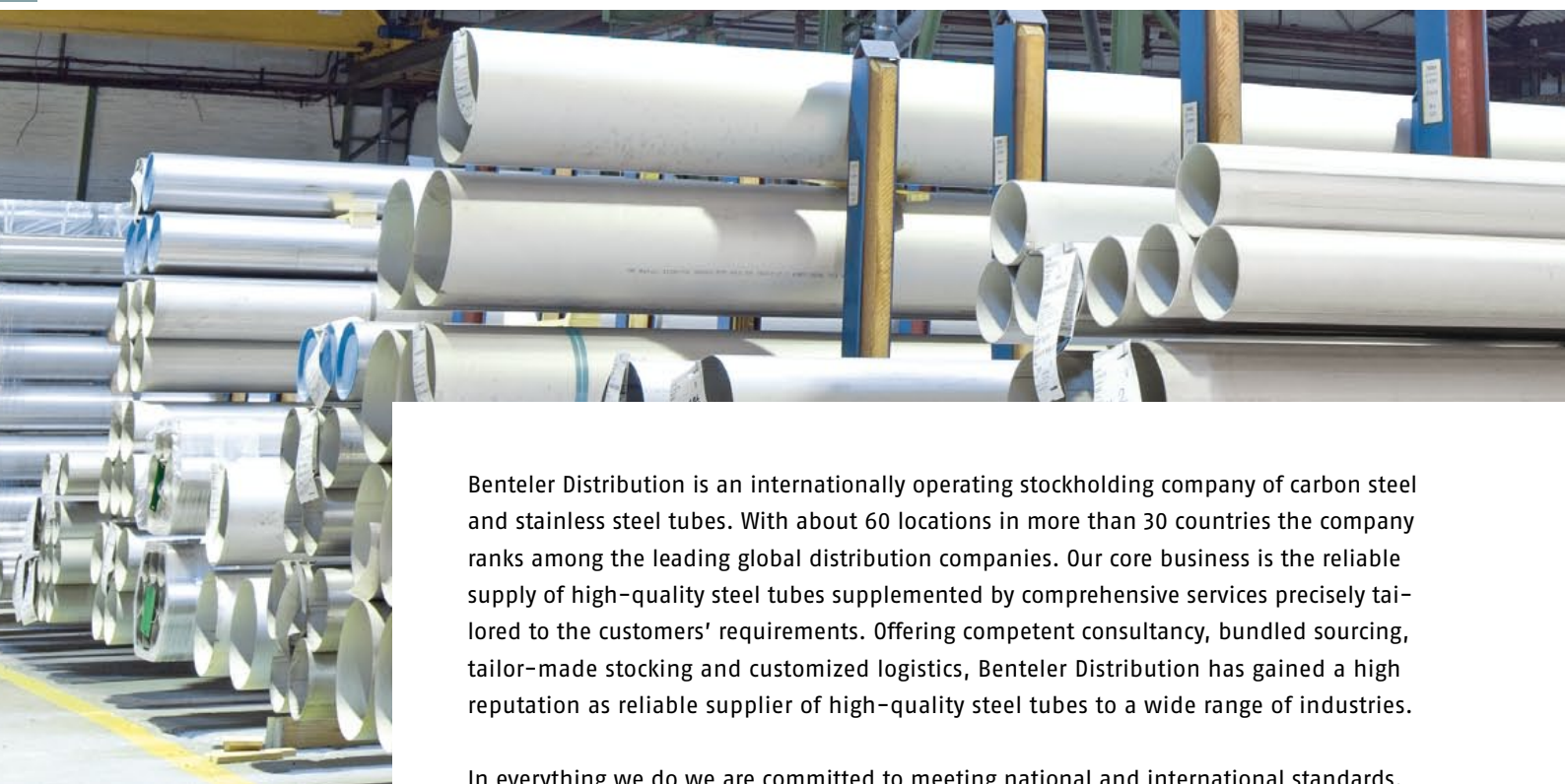






## Our value proposition

The reliable supply of high-quality steel tubes and customized service solutions is the promise we make to our customers in more than 30 countries



Benteler Distribution is an internationally operating stockholding company of carbon steel and stainless steel tubes. With about 60 locations in more than 30 countries the company ranks among the leading global distribution companies. Our core business is the reliable supply of high-quality steel tubes supplemented by comprehensive services precisely tailored to the customers' requirements. Offering competent consultancy, bundled sourcing, tailor-made stocking and customized logistics, Benteler Distribution has gained a high reputation as reliable supplier of high-quality steel tubes to a wide range of industries.

In everything we do we are committed to meeting national and international standards. Our documented processes are certified according to the norm DIN EN ISO 9001. This commitment to quality is shared by our suppliers which undergo regular quality checks and certifications.



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## Our processing spectrum

### Processing

Turning, drilling, milling, stamping, adjustment, enlargement, bending, punching, reduction

### Surface treatment

Sandblasting, capping, pickling, degreasing, brushing, hot-dip galvanizing, galvanizing, PE covering, powder coating, chromium-plating, nickel-plating, copper-plating, washing, cementing, forging, grinding, pre-turning, rolling polishing

### Cutting technology

Sawing, tapping, laser cutting, jet cutting, flame cutting

### Tube end finishing

Bordering, deburring, chamfering, thread cutting, vibratory grinding

### Heat treatment

Quenching and tempering, normalizing, riveting, nitration, annealing, inductive-annealing, other annealing methods with following adjustment

## Precision steel tubes

### Seamless precision steel tubes

|                            |                                                                             |
|----------------------------|-----------------------------------------------------------------------------|
| <b>Standard</b>            | EN 10305-1                                                                  |
| <b>Dimensions</b>          | 4 x 0.5 mm to 270 x 25 mm                                                   |
| <b>Lengths</b>             | 4 to 18 m<br>other lengths and fixed lengths on request                     |
| <b>Delivery conditions</b> | + C (BK)<br>+ N (NBK)<br>+ SR (BKS)<br>other delivery conditions on request |
| <b>Materials</b>           | Steel grade (EN)<br>E235<br>E355<br>other materials on request              |
| <b>Certification</b>       | 3.1 acc. to EN 10204<br>other certifications on request                     |

### Seamless hydraulic and pneumatic steel tubes (HPL)

|                            |                                                                                                                                                                                                                                                      |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Standard</b>            | EN 10305-4                                                                                                                                                                                                                                           |
| <b>Dimensions</b>          | 4 x 0.5 mm to 114.3 x 14 mm                                                                                                                                                                                                                          |
| <b>Lengths</b>             | 6 m<br>other lengths and fixed lengths on request                                                                                                                                                                                                    |
| <b>Delivery conditions</b> | + N (NBK)<br>other delivery conditions on request                                                                                                                                                                                                    |
| <b>Materials</b>           | Steel grade (EN)<br>E235<br>E355<br>other materials on request                                                                                                                                                                                       |
| <b>Surface treatment</b>   | phosphatized, non-phosphatized, outside galvanized and yellow chromated or outside galvanized and blue passivated (Chromium VI-free acc. to End of Life Vehicle Directive)<br>thin and thick coat passivation and other surface treatment on request |
| <b>Ends</b>                | tube ends closed with plugs or caps                                                                                                                                                                                                                  |
| <b>Marking</b>             | continuous marking along the entire tube length                                                                                                                                                                                                      |
| <b>Certification</b>       | 3.1 acc. to EN 10204<br>other certifications on request                                                                                                                                                                                              |



## Seamless, cold formed precision steel tubes for the production of piston tubes (HPK)

|                            |                                                                                                               |
|----------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Standard</b>            | EN 10305-1                                                                                                    |
| <b>Dimensions</b>          | 35 x 3.5 mm to 300 x 25 mm                                                                                    |
| <b>Tolerances</b>          | acc. to customer specifications                                                                               |
| <b>Delivery conditions</b> | +C (BK) cold finished, hard<br>+SR (BKS) cold finished and stress-relief annealed<br>+N (NBK) normal annealed |
| <b>Materials</b>           | Steel grade (EN)<br>E355<br>other materials on request                                                        |
| <b>Certification</b>       | 3.1 acc. to EN 10204<br>other certifications on request                                                       |

## Welded precision steel tubes

|                            |                                                                                                                                                           |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Standard</b>            | EN 10305-3                                                                                                                                                |
| <b>Dimensions</b>          | 10 x 1 mm to 159 x 4.5 mm                                                                                                                                 |
| <b>Lengths</b>             | 6 m<br>other lengths and fixed lengths on request                                                                                                         |
| <b>Delivery conditions</b> | +CR1 (BKM)<br>+CR2 (BKM/soft)<br>+N (NBK)<br>other delivery conditions on request                                                                         |
| <b>Materials</b>           | Steel grade (EN)<br>E195<br>E235<br>other materials on request                                                                                            |
| <b>Surface treatment</b>   | pickled or non-pickled hot rolled strip, cold rolled strip, aluminized,<br>thermally galvanized, galvanized, sendzimir galvanized strip,<br>inside grated |
| <b>Certification</b>       | 2.2 acc. to EN 10204<br>other certifications on request                                                                                                   |



## Precision steel tubes

### Welded, cold drawn precision steel tubes

|                            |                                                            |
|----------------------------|------------------------------------------------------------|
| <b>Standard</b>            | EN 10305-2                                                 |
| <b>Dimensions</b>          | 8 x 1 mm to 200 x 10 mm                                    |
| <b>Lengths</b>             | 4 to 7 m, other lengths and fixed lengths on request       |
| <b>Delivery conditions</b> | +C (BK)   +N (NBK)   +A (GBK)   +LC (BKW)   +SR (BKS)      |
| <b>Materials</b>           | Steel grade (EN)<br>E235, E355, other materials on request |
| <b>Certification</b>       | 3.1 acc. to EN 10204<br>other certifications on request    |

### Welded precision steel tubes (square or rectangular)

|                            |                                                                                                                                                                                                                 |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Standard</b>            | EN 10305-5                                                                                                                                                                                                      |
| <b>Dimensions</b>          | <ul style="list-style-type: none"> <li>- square 12 x 12 x 1.5 mm to 100 x 100 x 5 mm</li> <li>- rectangular 20 x 10 x 1.5 mm to 120 x 80 x 5 mm</li> </ul>                                                      |
| <b>Lengths</b>             | 6 m, other lengths and fixed lengths on request                                                                                                                                                                 |
| <b>Delivery conditions</b> | +CR1 (BKM)<br>+CR2 (BKM/soft), other delivery conditions on request                                                                                                                                             |
| <b>Materials</b>           | Steel grade (EN)<br>E195, E235, E275, E355, other materials on request                                                                                                                                          |
| <b>Surface treatment</b>   | pickled or non-pickled hot rolled strip, cold rolled strip, aluminized, thermally galvanized, galvanized, sendzimir galvanized strip, inside grated, welded seam positioned (on request positioned on the edge) |
| <b>Certification</b>       | 2.2 acc. to EN 10204<br>other certifications on request                                                                                                                                                         |

### Welded precision steel tubes – Benteler Special 07

|                            |                                                                          |
|----------------------------|--------------------------------------------------------------------------|
| <b>Dimensions</b>          | 4.75 x 0.5 mm to 12 x 1.8 mm                                             |
| <b>Tolerances</b>          | outside diameter acc. to EN 10305-2<br>wall thickness acc. to EN 10305-3 |
| <b>Lengths</b>             | 6 m, other lengths and fixed lengths on request                          |
| <b>Delivery conditions</b> | +N (NBK)<br>+CR1, other delivery conditions on request                   |
| <b>Materials</b>           | Steel grade (EN)<br>E195, E235, other materials on request               |
| <b>Surface treatment</b>   | non-galvanized                                                           |
| <b>Testing</b>             | eddy current testing acc. to EN 10246-3                                  |
| <b>Certification</b>       | 2.2 acc. to EN 10204<br>other certifications on request                  |



## Welded precision steel tubes – Benteler ZISTA 07

|                            |                                                                                                                                                                                          |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dimensions</b>          | 4.75 x 0.5 mm to 12 x 1.8 mm                                                                                                                                                             |
| <b>Tolerances</b>          | outside diameter acc. to EN 10305-2<br>wall thickness acc. to EN 10305-3                                                                                                                 |
| <b>Lengths</b>             | 6 m<br>other lengths and fixed lengths on request                                                                                                                                        |
| <b>Delivery conditions</b> | +N (NBK)<br>+CR1<br>other delivery conditions on request                                                                                                                                 |
| <b>Materials</b>           | Steel grade (EN)<br>E195<br>E235<br>other materials on request                                                                                                                           |
| <b>Surface treatment</b>   | outside galvanized and yellow chromated or outside galvanized and blue passivated (Chromium VI-free acc. to End of Life Vehicle Directive)<br>thin and thick coat passivation on request |
| <b>Testing</b>             | eddy current testing acc. to EN 10246-3                                                                                                                                                  |
| <b>Certification</b>       | 2.2 acc. to EN 10204<br>other certifications on request                                                                                                                                  |

## ZISTAPLEX

|                            |                                                                                            |
|----------------------------|--------------------------------------------------------------------------------------------|
| <b>Standard</b>            | EN 10305-1/-2/-3/-4                                                                        |
| <b>Dimensions</b>          | 4 x 0.5 mm to 42 x 6 mm                                                                    |
| <b>Lengths</b>             | 6 m<br>other lengths and fixed lengths on request                                          |
| <b>Delivery conditions</b> | +C (BK)<br>+N (NBK)<br>other delivery conditions on request                                |
| <b>Materials</b>           | Steel grade (EN)<br>E235<br>E355<br>other materials on request                             |
| <b>Surface treatment</b>   | outside galvanized, additional organic coating, RAL 9005, black<br>other colors on request |
| <b>Marking</b>             | continuous marking along the entire tube length on request                                 |
| <b>Certification</b>       | 3.1 acc. to EN 10204<br>other certifications on request                                    |

## Cylinder tubes

### Ready to use cylinder tubes

|                            |                                                                                                       |
|----------------------------|-------------------------------------------------------------------------------------------------------|
| <b>Standard</b>            | EN 10305-1/-2                                                                                         |
| <b>Dimensions</b>          | 30 x 5 mm to 250 x 15 mm                                                                              |
| <b>Tolerances</b>          | outside diameter acc. to EN 10305-1/-2<br>inside diameter acc. to H9, ISO 286 part 2                  |
| <b>Lengths</b>             | manufactured and fixed lengths                                                                        |
| <b>Delivery conditions</b> | + C (BK) cold finished                                                                                |
| <b>Materials</b>           | Steel grade (EN)<br>E355<br>other materials on request                                                |
| <b>Surface roughness</b>   | Ra max. 0.8 $\mu$ , exceptions admitted up to 1 $\mu$                                                 |
| <b>Testing</b>             | non-destructive testing acc. to EN 10246-7<br>non-destructive eddy current testing acc. to EN 10246-3 |
| <b>Certification</b>       | 3.1 acc. to EN 10204<br>other certifications on request                                               |





## Honed or skived and roller burnished cylinder tubes

|                                   |                                                                                                       |
|-----------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>Standard</b>                   | EN 10305-1/-2                                                                                         |
| <b>Dimensions</b>                 | 50 x 5 mm to 230 x 15 mm                                                                              |
| <b>Tolerances</b>                 | outside diameter acc. to EN 10305-1/-2<br>inside diameter acc. to H8, ISO 286 part 2                  |
| <b>Lengths</b>                    | manufactured and fixed lengths                                                                        |
| <b>Delivery conditions</b>        | + SR                                                                                                  |
| <b>Materials</b>                  | Steel grade (EN)<br>E355<br>other materials on request                                                |
| <b>Surface roughness (inside)</b> | Ra max. 0.3 $\mu$ acc. to EN ISO 4287                                                                 |
| <b>Testing</b>                    | non-destructive testing acc. to EN 10246-7<br>non-destructive eddy current testing acc. to EN 10246-3 |
| <b>Certification</b>              | 3.1 acc. to EN 10204<br>other certifications on request                                               |

## Cylinder tubes suitable for honing and roller burnishing

|                            |                                                             |
|----------------------------|-------------------------------------------------------------|
| <b>Standard</b>            | EN 10305-1/-2                                               |
| <b>Dimensions</b>          | 50 x 5 mm to 230 x 15 mm                                    |
| <b>Tolerances</b>          | outside diameter acc. to EN 10305-2                         |
| <b>Delivery conditions</b> | + SR                                                        |
| <b>Surface treatment</b>   | inside suitable for honing or skiving and roller burnishing |
| <b>Certification</b>       | 3.1 acc. to EN 10204<br>other certifications on request     |

# Piston tubes and piston rods

## Hard chromed bars for piston rod applications

|                          |                                                                                                                                                                              |                  |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| Dimensions               | outside diameter 8 to 18 mm or 20 to 250 mm                                                                                                                                  |                  |
| Tolerances               | outside diameter 8 to 18 mm acc. to f8                                                                                                                                       |                  |
|                          | outside diameter 20 to 250 mm acc. to f7                                                                                                                                     |                  |
|                          | other tolerances on request                                                                                                                                                  |                  |
|                          |                                                                                                                                                                              |                  |
| Materials                | Material number                                                                                                                                                              | Steel grade (EN) |
|                          | 1.5217                                                                                                                                                                       | 20MnV6           |
|                          | 1.1213*                                                                                                                                                                      | Cf 53 (DIN)      |
|                          | 1.1303*                                                                                                                                                                      | 38MnVS6          |
|                          | 1.7225*                                                                                                                                                                      | 42CrMo4 + QT     |
|                          | 1.1191*                                                                                                                                                                      | C45E             |
|                          | other materials on request                                                                                                                                                   |                  |
| *also induction hardened |                                                                                                                                                                              |                  |
|                          |                                                                                                                                                                              |                  |
| Surface                  |                                                                                                                                                                              |                  |
| – treatment              | chromed,<br>double chromed tubes on request                                                                                                                                  |                  |
| – roughness              | Ra max. 0.2 µm                                                                                                                                                               |                  |
| Chrome                   |                                                                                                                                                                              |                  |
| – thickness              | min. 16 µm for tubes with an outside diameter of 8 to 18 mm<br>min. 20 µm for tubes with an outside diameter of 20 to 250 mm                                                 |                  |
| – micro hardness         | min. 850 HV 0.1                                                                                                                                                              |                  |
| Corrosion resistance     | min. 72 h in NSS rating 10<br>min. 200 h in NSS rating 9 for material 20MnV6 with an outside diameter of 20 to 100 mm<br>250 h to 500 h to 1000 h in NSS rating 9 on request |                  |
| Testing                  | corrosion testing acc. to ISO 9227                                                                                                                                           |                  |
| Certification            | 3.1 acc. to EN 10204                                                                                                                                                         |                  |
|                          | other certifications on request                                                                                                                                              |                  |



## Hard chromed piston tubes (HPK)

|                             |                                                                                                      |
|-----------------------------|------------------------------------------------------------------------------------------------------|
| <b>Standard</b>             | EN 10305-1                                                                                           |
| <b>Dimensions</b>           | 35 x 3.5 mm to 300 x 15 mm                                                                           |
| <b>Tolerances</b>           | outside diameter acc. to f7                                                                          |
| <b>Delivery conditions</b>  | + C (BK) cold finished, hard<br>+ SR cold finished and stress-relief annealed<br>+ N normal annealed |
| <b>Materials</b>            | Steel grade (EN)<br>E355<br>other materials on request                                               |
| <b>Surface</b>              |                                                                                                      |
| - treatment                 | chromed                                                                                              |
| - roughness                 | Ra max. 0.2 µm                                                                                       |
| <b>Chrome</b>               |                                                                                                      |
| - thickness                 | min. 20 µm                                                                                           |
| - micro hardness            | min. 850 HV 0.1                                                                                      |
| <b>Corrosion resistance</b> | min. 72 h in NSS rating 10<br>min. 120 h in NSS rating 9                                             |
| <b>Testing</b>              | corrosion testing acc. to ISO 9227                                                                   |
| <b>Certification</b>        | 3.1 acc. to EN 10204<br>other certifications on request                                              |

## Hot rolled tubes

### Seamless hot rolled tubes for the steel construction industry

|                      |                                                                                   |
|----------------------|-----------------------------------------------------------------------------------|
| <b>Standard</b>      | EN 10210, EN 10220                                                                |
| <b>Dimensions</b>    | 10.2 x 1.6 mm to 660 x 100 mm<br>other dimensions on request                      |
| <b>Tolerances</b>    |                                                                                   |
| - outside diameter   | ±1 % (min. ±0.5 mm, max. ±10 mm)                                                  |
| - wall thickness     | ±10 %                                                                             |
| - straightness       | 0.2 % of the tube length (max. 3 mm/m)                                            |
| <b>Lengths</b>       | 4 to 13 m<br>other lengths and fixed lengths on request                           |
| <b>Materials</b>     | Steel grade (EN)<br>E355 J2H<br>S355 J2H<br>S355 NH<br>other materials on request |
| <b>Marking</b>       | producer, EN standard, material, heat code or identification<br>number            |
| <b>Testing</b>       | testing on request                                                                |
| <b>Certification</b> | 3.1 acc. to EN 10204<br>other certifications on request                           |

### Seamless hot rolled tubes for pressure purposes

|                      |                                                                                            |
|----------------------|--------------------------------------------------------------------------------------------|
| <b>Standard</b>      | EN 10216-1                                                                                 |
| <b>Dimensions</b>    | 10.2 x 1.6 mm to 660 x 14.2 mm<br>other dimensions on request                              |
| <b>Lengths</b>       | 4 to 14 m<br>other lengths and fixed lengths on request                                    |
| <b>Materials</b>     | Steel grade (EN)<br>P235 TR 1<br>P265 TR 1<br>other materials on request                   |
| <b>Marking</b>       | producer, EN standard, material, heat code or identification<br>number, certification mark |
| <b>Certification</b> | 3.1 acc. to EN 10204<br>other certifications on request                                    |





## Seamless hot rolled tubes for the mechanical engineering industry

|                            |                                                                                             |
|----------------------------|---------------------------------------------------------------------------------------------|
| <b>Standard</b>            | EN 10297-1                                                                                  |
| <b>Dimensions</b>          | 10.2 x 1.6 mm to 660 x 100 mm<br>other dimensions on request                                |
| <b>Lengths</b>             | 4 to 13 m<br>other lengths and fixed lengths on request                                     |
| <b>Delivery conditions</b> | + AR<br>+ N<br>other delivery conditions on request                                         |
| <b>Materials</b>           | Steel grade (EN)<br>E235<br>E355<br>E470<br>other materials on request                      |
| <b>Marking</b>             | producer, EN standard, material, heat code or identification number,<br>delivery conditions |
| <b>Testing</b>             | water pressure testing or leak testing acc. to EN 10246-1<br>other testing on request       |
| <b>Certification</b>       | 3.1 acc. to EN 10204<br>other certifications on request                                     |

# Steel construction tubes and standard and thick wall tubes

## Cold formed and welded hollow sections of non-alloy and fine grain construction steels

|                                 |                                                                                                                                      |                                                                                                                                          |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Standard</b>                 | EN 10219-1/-2                                                                                                                        |                                                                                                                                          |
| <b>Dimensions</b>               |                                                                                                                                      |                                                                                                                                          |
| - round                         | 26.9 x 2.6 mm to 1,219 x 25 mm                                                                                                       |                                                                                                                                          |
| - square                        | 25 x 25 x 3 mm to 400 x 400 x 20 mm                                                                                                  |                                                                                                                                          |
| - rectangular                   | 40 x 30 x 3 mm to 600 x 400 x 20 mm                                                                                                  |                                                                                                                                          |
| <b>Tolerances</b>               |                                                                                                                                      |                                                                                                                                          |
| - outside diameter              | round                                                                                                                                | ±1 % (min. ±0.5 mm, max. ±10 mm)                                                                                                         |
|                                 | square, rectangular                                                                                                                  | ±1 % (min. ±0.5 mm) if height and width < 100 mm<br>±0,8 % if height and width ≥ 100 and ≤ 200 mm<br>±0,6 % if height and width > 200 mm |
| - straightness                  | round                                                                                                                                | 0.2 % of the tube length                                                                                                                 |
|                                 | square, rectangular                                                                                                                  | 0.15 % of the tube length                                                                                                                |
| <b>Lengths</b>                  | 6 to 15 m, special lengths up to 18 m, single lengths up to 24 m<br>other lengths and fixed lengths on request                       |                                                                                                                                          |
| <b>Delivery conditions</b>      | electric resistance welding (ERW) or submerged arc welding (SAW)<br>or heat treatment, welded seam on request annealed or unannealed |                                                                                                                                          |
| <b>Materials</b>                | Material number                                                                                                                      | Steel grade (EN)                                                                                                                         |
| - unannealed steel              | 1.0039                                                                                                                               | S235 JRH                                                                                                                                 |
|                                 | 1.0149                                                                                                                               | S275 JOH                                                                                                                                 |
|                                 | 1.0138                                                                                                                               | S275 J2H                                                                                                                                 |
|                                 | 1.0547                                                                                                                               | S355 JOH                                                                                                                                 |
|                                 | 1.0576                                                                                                                               | S355 J2H                                                                                                                                 |
| - fine grain steel              | materials on request                                                                                                                 |                                                                                                                                          |
| <b>Marking</b>                  | producer, EN standard, material, heat code or identification number                                                                  |                                                                                                                                          |
| <b>Certification</b>            |                                                                                                                                      |                                                                                                                                          |
| - grade JR and JO               | 2.2 acc. to EN 10204                                                                                                                 |                                                                                                                                          |
|                                 | other certifications on request                                                                                                      |                                                                                                                                          |
| - grade J2 and fine grain steel | 3.1 acc. to EN 10204                                                                                                                 |                                                                                                                                          |
|                                 | other certifications on request                                                                                                      |                                                                                                                                          |



## Hot formed hollow sections of non-alloy and fine grain construction steels

|                                 |                                                                     |                  |
|---------------------------------|---------------------------------------------------------------------|------------------|
| <b>Standard</b>                 | EN 10210-1/-2                                                       |                  |
| <b>Dimensions</b>               |                                                                     |                  |
| - round                         | 21.3 x 2.3 mm to 1,219 x 100 mm                                     |                  |
| - square                        | 40 x 40 x 2.6 mm to 400 x 400 x 20 mm                               |                  |
| - rectangular                   | 50 x 30 x 2.6 mm to 500 x 300 x 20 mm                               |                  |
| <b>Delivery conditions</b>      | hot or cold formed with a following suitable heat treatment         |                  |
| <b>Materials</b>                | Material number                                                     | Steel grade (EN) |
| - non-alloy steel               | 1.0039                                                              | S235 JRH         |
|                                 | 1.0149                                                              | S275 J0H         |
|                                 | 1.0138                                                              | S275 J2H         |
|                                 | 1.0547                                                              | S355 J0H         |
|                                 | 1.0576                                                              | S355 J2H         |
| - fine grain steel              | materials on request                                                |                  |
| <b>Marking</b>                  | producer, EN standard, material, heat code or identification number |                  |
| <b>Testing</b>                  | testing on request                                                  |                  |
| <b>Certification</b>            |                                                                     |                  |
| - grade JR and J0               | 2.2 acc. to EN 10204                                                |                  |
|                                 | other certifications on request                                     |                  |
| - grade J2 and fine grain steel | 3.1 acc. to EN 10204                                                |                  |
|                                 | other certifications on request                                     |                  |

## Seamless steel tubes for machining

|                      |                                                                                          |                  |
|----------------------|------------------------------------------------------------------------------------------|------------------|
| <b>Standard</b>      | EN 10294-1                                                                               |                  |
| <b>Dimensions</b>    | 30 x 20 mm to 250 x 120 mm                                                               |                  |
|                      | other dimensions on request                                                              |                  |
| <b>Lengths</b>       | 4 to 8 m                                                                                 |                  |
|                      | other lengths and fixed lengths on request                                               |                  |
| <b>Materials</b>     | Material number                                                                          | Steel grade (EN) |
|                      | 1.0580                                                                                   | E355             |
|                      | 1.0592                                                                                   | E355 J2          |
|                      | 1.0599                                                                                   | E420 J2          |
|                      | 1.0536                                                                                   | E470             |
|                      | 1.0644                                                                                   | E590 K2          |
|                      | other materials on request                                                               |                  |
| <b>Marking</b>       | producer, EN standard, material, heat code or identification number, delivery conditions |                  |
| <b>Testing</b>       | testing on request                                                                       |                  |
| <b>Certification</b> | 3.1 acc. to EN 10204                                                                     |                  |
|                      | other certifications on request                                                          |                  |

## Boiler and heat exchanger tubes

### Seamless boiler tubes

|                           |                                                                                                                                                   |                   |                         |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------|
| <b>Standard</b>           | EN 10216-2<br>other standards on request                                                                                                          |                   |                         |
| <b>Dimensions</b>         | 13.5 x 1.8 mm to 610 x 30 mm<br>other dimensions on request                                                                                       |                   |                         |
| <b>Tolerances</b>         | outside diameter and wall thickness acc. to EN 10216-2                                                                                            |                   |                         |
| <b>Lengths</b>            | 5 to 7 m, contingently 10 to 14 m<br>other lengths and fixed lengths on request                                                                   |                   |                         |
| <b>Materials</b>          | Steel grade (EN)                                                                                                                                  | Steel grade (JIS) | Steel grade (ASTM/ASME) |
|                           | P235 GH TC 1                                                                                                                                      | ST B 340          | A/SA 192                |
|                           | P235 GH TC 2                                                                                                                                      | ST B 410          | A/SA 210                |
|                           | 16Mo3                                                                                                                                             | ST B 510          | A/SA 213                |
|                           | 13CrMo4-5                                                                                                                                         | ST BA 12          | T5, T11, T12, T22, T91  |
|                           | 10CrMo9-10                                                                                                                                        | ST BA 22          |                         |
|                           |                                                                                                                                                   | ST BA 24          |                         |
|                           | other materials on request                                                                                                                        |                   |                         |
| <b>Surface protection</b> | surface protection on request                                                                                                                     |                   |                         |
| <b>Marking</b>            | producer, EN standard, material,<br>heat code or identification number,<br>if applicable test category and tube number<br>(depending on material) |                   |                         |
| <b>Leak testing</b>       | water pressure or electromagnetic testing acc. to<br>EN 10246-1 (SEP 1925)<br>other testing on request                                            |                   |                         |
| <b>Certification</b>      | 3.1 acc. to EN 10204<br>3.2 acc. to EN 10204 for alloyed boiler tubes                                                                             |                   |                         |





## Seamless heat exchanger tubes

### Standard

|                     |                                                         |
|---------------------|---------------------------------------------------------|
| - metric dimensions | EN 10216-2                                              |
| - inch dimensions   | ASTM A 179M-1990a, ASME SA 179M, ASME Section II Part A |

### Dimensions

|                     |                                  |
|---------------------|----------------------------------|
| - metric dimensions | 10 x 1 mm to 30 x 2.5 mm         |
| - inch dimensions   | 19.05 x 1.65 mm to 25.4 x 3.4 mm |
|                     | other dimensions on request      |

### Lengths

lengths and fixed lengths on request

### Materials

|                     |                            |                         |
|---------------------|----------------------------|-------------------------|
|                     | Steel grade (EN)           | Steel grade (ASTM/ASME) |
| - metric dimensions | P235 GH TC 1               | SA 556 C 2              |
| - inch dimensions   | P235 GH TC 1               | A 179/SA 179            |
|                     | other materials on request |                         |

### Marking

producer, material, heat code or identification number, certification mark

### Leak testing

|                     |                                                               |
|---------------------|---------------------------------------------------------------|
| - metric dimensions | electromagnetic testing acc. to EN 10246-1 (SEP 1925)         |
| - inch dimensions   | electromagnetic testing acc. to ASME SA 450, test hole 0.8 mm |

### Certification

3.1 acc. to EN 10204  
other certifications on request

## U-bend tubes

### Standard

|                     |                                                         |
|---------------------|---------------------------------------------------------|
| - metric dimensions | EN 10216-2<br>ASME SA 556 C 2                           |
| - inch dimensions   | ASTM A 179M 1990a, ASME SA 179M, ASME Section II Part A |

### Dimensions

|                     |                                  |
|---------------------|----------------------------------|
| - metric dimensions | 10 x 1 mm to 30 x 2.5 mm         |
| - inch dimensions   | 19.05 x 1.65 mm to 25.4 x 3.4 mm |

### Tolerances

|                     |                                                                         |
|---------------------|-------------------------------------------------------------------------|
| - metric dimensions | acc. to EN 10305-1                                                      |
| - inch dimensions   | outside diameter acc. to EN 10305-1<br>wall thickness 0/+20 % (SA 556M) |

### Materials

|                     |                            |                         |
|---------------------|----------------------------|-------------------------|
|                     | Steel grade (EN)           | Steel grade (ASTM/ASME) |
| - metric dimensions | P235 GH TC 1               | SA 556 C 2              |
| - inch dimensions   | P235 GH TC 1               | A 179/SA 179            |
|                     | other materials on request |                         |

### Certification

3.1 acc. to EN 10204  
other certifications on request

# Stainless steel tubes

## Seamless stainless steel tubes

|                            |                                                              |                         |
|----------------------------|--------------------------------------------------------------|-------------------------|
| <b>Standard</b>            | EN 10216-5, AD2000-W2<br>ASTM A 312                          |                         |
| <b>Dimensions</b>          | 4 x 0.5 mm to 219.1 x 12.7 mm<br>other dimensions on request |                         |
| <b>Tolerances</b>          | acc. to EN ISO 1127 or EN 10305-1 or ASTM A 269/312/999      |                         |
| <b>Lengths</b>             | 4 to 7 m<br>other lengths and fixed lengths on request       |                         |
| <b>Delivery conditions</b> | cold finished or extruded, blank annealed or pickled         |                         |
| <b>Materials</b>           | Material number                                              | Steel grade (ASTM/ASME) |
|                            | 1.4301/06                                                    | TP 304/304L             |
|                            | 1.4401/04                                                    | TP 316/316L             |
|                            | 1.4541                                                       | TP 321                  |
|                            | 1.4571                                                       | TP 316Ti                |
|                            | other materials on request                                   |                         |
| <b>Certification</b>       | 3.1 or 3.2 (in case of AD2000-W22) acc. to EN 10204          |                         |



## Welded stainless process/diary tubes

|                            |                                                              |                         |
|----------------------------|--------------------------------------------------------------|-------------------------|
| <b>Standard</b>            | EN 10217-7                                                   |                         |
| <b>Dimensions</b>          | 4 x 1 mm to 609.6 x 4 mm<br>other dimensions on request      |                         |
| <b>Tolerances</b>          | acc. to EN ISO 1127                                          |                         |
| <b>Lengths</b>             | 6 m<br>other lengths and fixed lengths on request            |                         |
| <b>Delivery conditions</b> | heat-treated or non-heat-treated, blank, pickled or polished |                         |
| <b>Materials</b>           | Material number                                              | Steel grade (ASTM/ASME) |
|                            | 1.4301/07                                                    | TP 304/304L             |
|                            | 1.4401/04                                                    | TP 316/316L             |
|                            | 1.4541                                                       | TP 321                  |
|                            | 1.4571                                                       | TP 316Ti                |
|                            | other materials on request                                   |                         |
| <b>Certification</b>       | 3.1 acc. to EN 10204<br>other certifications on request      |                         |

## Square and rectangular tubes

|                            |                                                                                          |  |
|----------------------------|------------------------------------------------------------------------------------------|--|
| <b>Dimensions</b>          | - square 10 x 10 x 1 mm<br>- rectangular 250 x 150 x 5 mm<br>other dimensions on request |  |
| <b>Lengths</b>             | 6 m<br>other lengths and fixed lengths on request                                        |  |
| <b>Delivery conditions</b> | metal blank or polished grain 240                                                        |  |
| <b>Materials</b>           | Material number                                                                          |  |
|                            | 1.4301                                                                                   |  |
|                            | 1.4571                                                                                   |  |
|                            | other materials on request                                                               |  |
| <b>Certification</b>       | 2.2 or 3.1 (for raw material)<br>other certification on request                          |  |

## Comparison table of international standards and steel grades

|                         | DIN Steel Grade and Number      | EN* Steel Grade     | DIN-Standard<br>EN-Standard<br>ISO-Standard | Operation / Temperature | Application Area                                                                                |
|-------------------------|---------------------------------|---------------------|---------------------------------------------|-------------------------|-------------------------------------------------------------------------------------------------|
| Carbon Grades           | St 37.0<br>1.0254               | P 235 TR 1          |                                             | ≤ 300 °C                | Constructions under pressure including pipework for the transportation of fluids under pressure |
|                         | St 44.0<br>1.0256               | P 265 TR 1          | DIN 1629<br>EN 10216-1<br>ISO 9329-1        |                         |                                                                                                 |
|                         | St 52.0<br>1.0421               | -                   |                                             |                         |                                                                                                 |
|                         | St 37.4<br>1.0255               | P 235 TR 2          |                                             | ≤ 300 °C                | Constructions under pressure including pipework for the transportation of fluids under pressure |
|                         | St 44.4<br>1.0257               | P 265 TR 2          | DIN 1630<br>EN 10216-1                      |                         |                                                                                                 |
|                         | St 52.4<br>1.0581               | -                   |                                             |                         |                                                                                                 |
| High Temperature Grades | St 35.8 class I<br>1.0305       | P 235 GH            |                                             | ≤ 450 °C                | Construction of steam generating equipment and for interconnecting pipework                     |
|                         | St 45.8 class I<br>1.0405       | P 265 GH            |                                             |                         |                                                                                                 |
|                         | 17 Mn 4<br>1.0481               | -                   |                                             |                         |                                                                                                 |
|                         | 19 Mn 5<br>1.0482               | -                   |                                             |                         |                                                                                                 |
|                         | St 35.8 class III<br>1.0305     | P 235 GH            |                                             | ≤ 480 °C                |                                                                                                 |
|                         | St 45.8 class III<br>1.0405     | P 265 GH            |                                             |                         |                                                                                                 |
|                         | 17 Mn 4<br>1.0481               | -                   | DIN 17175<br>EN 10216-2<br>ISO 9329-2       | ≤ 500 °C                |                                                                                                 |
|                         | 19 Mn 5<br>1.0482               | -                   |                                             | ≤ 530 °C                |                                                                                                 |
|                         | 15 Mo 3<br>1.5415               | 16 Mo 3             |                                             |                         |                                                                                                 |
|                         | 13 Cr Mo 4 4<br>1.7335          | 13 Cr Mo 4-5        |                                             | ≤ 560 °C                |                                                                                                 |
|                         | 10 Cr Mo 9 10<br>1.7380         | 10 Cr Mo 9-10       |                                             | ≤ 590 °C                |                                                                                                 |
|                         | 14 Mo V 6 3<br>1.7715           | 14 Mo V 6-3         |                                             | ≤ 560 °C                |                                                                                                 |
|                         | X20 Cr Mo V 12.1<br>1.4922      | X 20 Cr Mo V 11-1   |                                             | ≤ 650 °C                |                                                                                                 |
|                         | X10 Cr Mo V Nb 9.1**<br>1.4903  | X 10 Cr Mo V Nb 9-1 | EN 10216-2<br>ISO 9329-2                    | ≤ 650 °C                |                                                                                                 |
|                         | 8 Mo B 5-4<br>16 Mo 5<br>1.5423 | 8 Mo B 5-4<br>-     | acc. to<br>DIN 17175<br>EN 10216-2          | ≤ 530 °C<br>≤ 530 °C    |                                                                                                 |
|                         | 12 Cr 1 Mo V***                 | -                   |                                             | ≤ 600 °C                |                                                                                                 |
|                         | 25 Cr Mo 4<br>1.7218            | 25 Cr Mo 4          |                                             | ≤ 550 °C                |                                                                                                 |
|                         | 13 Cr Mo 4 4<br>1.7335          | 13 Cr Mo 4-5        |                                             | ≤ 570 °C                |                                                                                                 |
|                         | 10 Cr Mo 9 10<br>1.7380         | 10 Cr Mo 9-10       |                                             | ≤ 600 °C                |                                                                                                 |
|                         | 12 Cr Mo 9 10<br>1.7375         | 11 Cr Mo 9-10       | DIN 17176<br>EN 10216-2<br>ISO 9329         | ≤ 520 °C                |                                                                                                 |
|                         | 12 Cr Mo 12 10<br>1.7381        | -                   |                                             | ≤ 520 °C                |                                                                                                 |
|                         | 12 Cr Mo 19 5<br>1.7362         | X 11 Cr Mo 5        |                                             | ≤ 650 °C                |                                                                                                 |
|                         | 12 Cr Mo 9.1<br>1.7386          | X 11 Cr Mo 9-1      |                                             | ≤ 650 °C                |                                                                                                 |
| Low Temperature Grades  | TT St 35 N<br>1.0356            | P 215 NL            | DIN 17173<br>EN 10216-4<br>ISO 9329-3       | - 130 °C                | Construction for low temperature piping systems                                                 |
|                         | 10 Ni 14<br>1.5637              | 12 Ni 14            |                                             | - 185 °C                |                                                                                                 |

| ISO Grade              | ASTM<br>ASME<br>Standard / Grade             |                                    | BS<br>Standard / Grade     |                                         | NF<br>Standard / Grade                 |                                        | JIS<br>Standard / Grade |                      |
|------------------------|----------------------------------------------|------------------------------------|----------------------------|-----------------------------------------|----------------------------------------|----------------------------------------|-------------------------|----------------------|
| TS 360                 | A/SA 53                                      | Gr. A                              | 3059 Pt. 1<br>3601<br>6323 | Steel 320<br>320, 360<br>HFS 3<br>CFS 3 | A 49-112<br>A 49-210, -310, -321, -330 | TU E 220 A<br>TU 37 b                  | G 3454<br>G 3455        | STPG 38<br>STS 38    |
| TS 340                 | A/SA 53                                      | Gr. B                              | 3061<br>6323               | Steel 430<br>HFS 4<br>CFS 4             | A 49-501<br>A 49-112                   | TU E 275-2<br>TU E 275-3<br>TU E 235 A | G 3454<br>G 3455        | STPG 42<br>STS 42    |
| TS 500                 |                                              |                                    | 6323                       | Steel HFS 5<br>CFS 5                    | A 49-310, -311, -312, -321, -330       | TU 52 b                                |                         |                      |
| -                      |                                              |                                    |                            |                                         |                                        |                                        |                         |                      |
| -                      |                                              |                                    |                            |                                         |                                        |                                        |                         |                      |
| -                      |                                              |                                    |                            |                                         | A 49-321                               | TU 52 BT                               |                         |                      |
| PH 23                  | A/SA 106<br>A/SA 179<br>A/SA 192<br>A/SA 556 | Gr. A<br>Carbon<br>Steel<br>Gr. A2 | 3059 Pt. 2<br>3602 Pt. 1   | Steel 360 Cat. 2                        | A 49-215<br>A 49-219                   | TU 37 b<br>TU 37 F                     | G 3461                  | ST B 340             |
| PH 26                  | A/SA 106<br>A/SA 210<br>A/SA 556             | Gr. B<br>Gr. A1<br>Gr. B2          | 3602 Pt. 1                 | Steel 430 Cat. 2                        | A 49-215<br>A 49-219                   | TU 42 b<br>TU 42 F                     | G 3461                  | ST B 410             |
| PH 29                  | A/SA 106<br>A/SA 210<br>A/SA 556             | Gr. C<br>Gr. C<br>Gr. C2           | 3059 Pt. 2<br>3606         | Steel 440 Cat. 2                        |                                        |                                        |                         |                      |
| -                      |                                              |                                    |                            |                                         |                                        |                                        |                         |                      |
| PH 23                  |                                              |                                    | 3059 Pt. 2<br>3602 Pt. 1   | Steel 360 Cat. 2                        | A 49-213                               | TU 37 C                                |                         |                      |
| PH 26                  |                                              |                                    | 3602 Pt. 1                 | Steel 430 Cat. 2                        | A 49-213                               | TU 42 C                                |                         |                      |
| PH 29                  |                                              |                                    | 3059 Pt. 2<br>3606         | Steel 440 Cat. 2                        | A 49-213                               | TU 48 C                                |                         |                      |
| -                      |                                              |                                    |                            |                                         |                                        |                                        |                         |                      |
| 16 Mo 3                |                                              |                                    | 3059 Pt. 2<br>3606         | Steel 243                               | A 49-213, -215, -219                   | TU 15 D 3                              |                         |                      |
| 13 Cr Mo 4-5           | A/SA 199<br>A/SA 200<br>A/SA 213<br>A/SA 335 | T12<br><br>P12*                    | 3059 Pt. 2<br>3604<br>3606 | Steel 620-460                           | A 49-213, -215, -219                   | TU 13 CD 4 04                          | G 3458<br>G 3462        | ST PA 22<br>ST BA 22 |
| 11 Cr Mo 9-10          | A/SA 199<br>A/SA 200<br>A/SA 213<br>A/SA 335 | T22<br><br>P22                     | 3059 Pt. 2<br>3604<br>3606 | Steel 622-490                           | A 49-213, -215, -219                   | TU 10 CD 9 10                          | G 3458<br>G 3462        | ST PA 24<br>ST BA 24 |
| -                      |                                              |                                    | 3606                       | Steel 660                               |                                        |                                        |                         |                      |
| X 20 Cr Mo Ni V 11-1-1 |                                              |                                    | 3059 Pt. 2                 | Steel 762                               |                                        |                                        |                         |                      |
| X 10 Cr Mo V Nb V 9-1  | A/SA 199<br>A/SA 200<br>A/SA 213<br>A/SA 335 | T91<br><br>P91                     | 3604 Pt. 1                 | Steel 91                                | A 49-213                               | Z 10 CD<br>Nb V<br>09-01               |                         |                      |
| -                      |                                              |                                    | 3606                       | Steel 261                               |                                        |                                        |                         |                      |
| -                      | A/SA 161<br>A/SA 209<br>A/SA 335             | T1<br><br>P1                       | 3606                       | Steel 245                               |                                        |                                        | G 3458<br>G 3462        | ST PA 12<br>ST BA 12 |
| -                      |                                              |                                    |                            |                                         |                                        |                                        |                         |                      |
| -                      |                                              |                                    |                            |                                         |                                        |                                        |                         |                      |
| 13 Cr Mo 4-5           | A/SA 199<br>A/SA 200<br>A/SA 213             | T11, T12                           | 3059 Pt. 2<br>3604<br>3606 | Steel 620-640                           | A 49-213, -215<br>A 49-217             | TU13 CD 4 04<br>TU 10 CD 5 05          | G 3458<br>G 3462        | ST PA 22<br>ST BA 22 |
| 11 CR Mo 9-10          | A/SA 199<br>A/SA 200<br>A/SA 213<br>A/SA 335 | T22<br><br>P22                     | 3059 Pt. 2<br>3604<br>3606 | Steel 622-490                           | A 49-213, -215, -217                   | TU 10 CD 9 10                          | G 3458<br>G 3462        | ST PA 24<br>ST BA 24 |
| 11 Cr Mo 9-10          |                                              |                                    |                            |                                         |                                        |                                        |                         |                      |
| -                      | A/SA 199<br>A/SA 200<br>A/SA 213<br>A/SA 335 | T21<br><br>P21                     |                            |                                         |                                        |                                        |                         |                      |
| X 11 Cr Mo 5           | A/SA 199<br>A/SA 200<br>A/SA 213<br>A/SA 335 | T5<br><br>P5                       | 3604<br>3606               | Steel 625                               | A 49-213<br>A 49-219                   | TU Z 10 CD 5 05<br>TU Z 12 CD 5 05     | G 3458<br>G 3462        | ST PA 25<br>ST BA 25 |
| X 11 Cr Mo 9-1         | A/SA 199<br>A/SA 200<br>A/SA 213<br>A/SA 335 | T9<br><br>P9                       | 3604                       | Steel 629                               | A 49-213                               | Z 10 DC 9                              |                         |                      |
| PL 21                  | A/SA 333<br>A/SA 334                         | Gr. 1<br>Gr. 1                     |                            |                                         |                                        |                                        | G 3460<br>G 3464        | ST PL 39<br>ST BL 39 |
| 12 Ni 14               | A/SA 333<br>A/SA 334                         | Gr. 3<br>Gr. 3                     | 3603                       | 503 LT                                  | A 49-215, -230, -330                   | TU 10 N 14                             | G 3460<br>G 3464        | ST PL 46<br>ST BL 46 |



## Pipe schedule (metric)

| Nominal pipe |       | OD    | 5S          | 10S         | STD         | 40S         | 40           | xs           | 80S          | 80           | 160          | xxs          |
|--------------|-------|-------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|
| mm           | inch  | mm    |             |             |             |             |              |              |              |              |              |              |
| 6            |       | 10.3  |             | <b>1.24</b> | <b>1.73</b> | <b>1.73</b> | <b>1.73</b>  | <b>2.41</b>  | <b>2.41</b>  | <b>2.41</b>  |              |              |
|              | 1/8   |       |             | 0.28        | 0.37        | 0.36        | 0.37         | 0.47         | 0.48         | 0.47         |              |              |
| 8            |       | 13.7  |             | <b>1.65</b> | <b>2.24</b> | <b>2.24</b> | <b>2.24</b>  | <b>30.2</b>  | <b>3.02</b>  | <b>3.02</b>  |              |              |
|              | 1/4   |       |             | 0.51        | 0.63        | 0.64        | 0.63         | 0.80         | 0.82         | 0.80         |              |              |
| 10           |       | 17.1  |             | <b>1.65</b> | <b>2.31</b> | <b>2.31</b> | <b>2.31</b>  | <b>3.20</b>  | <b>3.20</b>  | <b>3.20</b>  |              |              |
|              | 3/8   |       |             | 0.64        | 0.84        | 0.86        | 0.84         | 1.10         | 1.12         | 1.10         |              |              |
| 15           |       | 21.3  | <b>1.65</b> | <b>2.11</b> | <b>2.77</b> | <b>2.77</b> | <b>2.77</b>  | <b>3.73</b>  | <b>3.73</b>  | <b>3.73</b>  | <b>4.78</b>  | <b>7.47</b>  |
|              | 1/2   |       | 0.82        | 1.01        | 1.27        | 1.30        | 1.27         | 1.62         | 1.65         | 1.62         | 1.95         | 2.55         |
| 20           |       | 26.7  | <b>1.65</b> | <b>2.11</b> | <b>2.87</b> | <b>2.87</b> | <b>2.87</b>  | <b>3.91</b>  | <b>3.91</b>  | <b>3.91</b>  | <b>5.56</b>  | <b>7.82</b>  |
|              | 3/4   |       | 10.4        | 1.31        | 1.69        | 1.71        | 1.69         | 2.20         | 2.24         | 2.20         | 2.90         | 3.64         |
| 25           |       | 33.4  | <b>1.65</b> | <b>2.77</b> | <b>3.38</b> | <b>3.38</b> | <b>3.38</b>  | <b>4.55</b>  | <b>4.55</b>  | <b>4.55</b>  | <b>6.35</b>  | <b>9.09</b>  |
|              | 1     |       | 1.33        | 2.13        | 2.50        | 2.55        | 2.50         | 3.24         | 3.29         | 3.24         | 4.24         | 5.45         |
| 32           |       | 42.2  | <b>1.65</b> | <b>2.77</b> | <b>3.56</b> | <b>3.56</b> | <b>3.56</b>  | <b>4.85</b>  | <b>4.85</b>  | <b>4.85</b>  | <b>6.35</b>  | <b>9.70</b>  |
|              | 1 1/4 |       | 1.68        | 2.76        | 3.39        | 3.46        | 3.39         | 4.47         | 4.56         | 4.47         | 5.61         | 7.77         |
| 40           |       | 48.3  | <b>1.65</b> | <b>2.77</b> | <b>3.68</b> | <b>3.68</b> | <b>3.68</b>  | <b>5.08</b>  | <b>5.08</b>  | <b>5.08</b>  | <b>7.14</b>  | <b>10.15</b> |
|              | 1 1/2 |       | 1.95        | 3.10        | 4.05        | 4.13        | 4.05         | 5.41         | 5.51         | 5.41         | 7.25         | 9.56         |
| 50           |       | 60.3  | <b>1.65</b> | <b>2.77</b> | <b>3.91</b> | <b>3.91</b> | <b>3.91</b>  | <b>5.54</b>  | <b>5.54</b>  | <b>5.54</b>  | <b>8.74</b>  | <b>11.07</b> |
|              | 2     |       | 2.44        | 4.01        | 5.44        | 5.54        | 5.44         | 7.48         | 7.63         | 7.48         | 11.11        | 13.44        |
| 65           |       | 73.0  | <b>2.11</b> | <b>3.05</b> | <b>5.16</b> | <b>5.16</b> | <b>5.16</b>  | <b>7.01</b>  | <b>7.01</b>  | <b>7.01</b>  | <b>9.53</b>  | <b>14.02</b> |
|              | 2 1/2 |       | 3.77        | 5.36        | 8.63        | 8.81        | 8.63         | 11.41        | 11.64        | 11.41        | 14.92        | 20.39        |
| 80           |       | 88.9  | <b>2.11</b> | <b>3.05</b> | <b>5.49</b> | <b>5.49</b> | <b>5.49</b>  | <b>7.62</b>  | <b>7.62</b>  | <b>7.62</b>  | <b>11.13</b> | <b>15.24</b> |
|              | 3     |       | 4.60        | 6.59        | 11.29       | 11.52       | 11.29        | 15.27        | 15.59        | 15.27        | 21.35        | 27.68        |
| 90           |       | 101.6 | <b>2.11</b> | <b>3.05</b> | <b>5.74</b> | <b>5.74</b> | <b>5.74</b>  | <b>8.08</b>  | <b>8.08</b>  | <b>8.08</b>  |              |              |
|              | 3 1/2 |       | 5.29        | 7.55        | 13.57       | 13.84       | 13.57        | 18.63        | 19.01        | 18.63        |              |              |
| 100          |       | 114.3 | <b>2.11</b> | <b>3.05</b> | <b>6.02</b> | <b>6.02</b> | <b>6.02</b>  | <b>8.56</b>  | <b>8.56</b>  | <b>8.56</b>  | <b>13.49</b> | <b>17.12</b> |
|              | 4     |       | 5.96        | 8.52        | 16.07       | 16.40       | 16.07        | 22.32        | 22.77        | 22.32        | 33.54        | 41.03        |
| 125          |       | 141.3 | <b>2.77</b> | <b>3.40</b> | <b>6.55</b> | <b>6.55</b> | <b>6.55</b>  | <b>9.53</b>  | <b>9.53</b>  | <b>9.53</b>  | <b>15.88</b> | <b>19.05</b> |
|              | 5     |       | 9.67        | 11.82       | 21.77       | 22.20       | 21.77        | 30.97        | 31.59        | 30.97        | 49.11        | 57.43        |
| 150          |       | 168.3 | <b>2.77</b> | <b>3.40</b> | <b>7.11</b> | <b>7.11</b> | <b>7.11</b>  | <b>10.97</b> | <b>10.97</b> | <b>10.97</b> | <b>18.26</b> | <b>21.95</b> |
|              | 6     |       | 11.55       | 14.13       | 28.26       | 28.83       | 28.26        | 42.56        | 43.42        | 42.56        | 67.56        | 79.22        |
| 200          |       | 219.1 | <b>2.77</b> | <b>3.76</b> | <b>8.18</b> | <b>8.18</b> | <b>8.18</b>  | <b>12.70</b> | <b>12.70</b> | <b>12.70</b> | <b>23.01</b> | <b>22.23</b> |
|              | 8     |       | 15.09       | 20.37       | 42.55       | 43.39       | 42.55        | 64.64        | 65.95        | 64.64        | 111.27       | 107.92       |
| 250          |       | 273.1 | <b>3.40</b> | <b>4.19</b> | <b>9.27</b> | <b>9.27</b> | <b>9.27</b>  | <b>12.70</b> | <b>12.70</b> | <b>15.09</b> | <b>25.58</b> | <b>25.40</b> |
|              | 10    |       | 23.08       | 28.34       | 60.31       | 61.52       | 60.31        | 81.55        | 83.19        | 96.01        | 172.33       | 155.15       |
| 300          |       | 323.9 | <b>3.96</b> | <b>4.57</b> | <b>9.53</b> | <b>9.52</b> | <b>10.31</b> | <b>12.70</b> | <b>12.70</b> | <b>17.48</b> | <b>33.32</b> | <b>25.40</b> |
|              | 12    |       | 31.89       | 36.73       | 73.88       | 75.32       | 79.73        | 97.46        | 99.43        | 132.08       | 238.76       | 186.97       |
| 350          |       | 355.6 | <b>3.96</b> | <b>4.78</b> | <b>9.53</b> |             | <b>11.13</b> | <b>12.70</b> |              | <b>19.05</b> | <b>35.71</b> |              |
|              | 14    |       | 35.06       | 42.14       | 81.33       |             | 94.55        | 107.39       |              | 158.10       | 281.70       |              |
| 400          |       | 406.4 | <b>4.19</b> | <b>4.78</b> | <b>9.53</b> |             | <b>12.70</b> | <b>12.70</b> |              | <b>21.44</b> | <b>40.49</b> |              |
|              | 16    |       | 42.41       | 48.26       | 93.27       |             | 123.30       | 123.30       |              | 203.53       | 365.35       |              |
| 450          |       | 457.2 | <b>4.19</b> | <b>4.78</b> | <b>9.53</b> |             | <b>14.27</b> | <b>12.70</b> |              | <b>23.88</b> | <b>45.24</b> |              |
|              | 18    |       | 47.77       | 54.36       | 105.16      |             | 155.80       | 139.15       |              | 254.55       | 459.37       |              |
| 500          |       | 508.0 | <b>4.78</b> | <b>5.54</b> | <b>9.53</b> |             | <b>15.09</b> | <b>12.70</b> |              | <b>26.19</b> | <b>50.01</b> |              |
|              | 20    |       | 60.46       | 70.00       | 117.15      |             | 183.42       | 155.12       |              | 311.17       | 564.81       |              |
| 550          |       | 558.8 | 4.78        | 5.54        | 9.53        |             |              | 12.70        |              | 28.58        | 53.98        |              |
|              | 22    |       | 66.57       | 77.06       | 129.13      |             |              | 171.09       |              | 373.83       | 672.26       |              |
| 600          |       | 609.6 | <b>5.54</b> | <b>6.35</b> | <b>9.53</b> |             | <b>17.48</b> | <b>12.70</b> |              | <b>30.96</b> | <b>59.54</b> |              |
|              | 24    |       | 84.16       | 96.37       | 141.12      |             | 255.41       | 187.06       |              | 442.08       | 808.22       |              |

Wall thickness = mm

Weight = kg/m (plain end mass)

5S, 10S, 40S, 80S – ANSI B36.19

## Table of gauges

| No. | S.W.G |       | B.W.G |       | G.B.   |        | B.S.   |       | U.S.G. |       | M.S.G. |       |
|-----|-------|-------|-------|-------|--------|--------|--------|-------|--------|-------|--------|-------|
|     | inch  | mm    | inch  | mm    | inch   | mm     | inch   | mm    | inch   | mm    | inch   | mm    |
| 0   | 0.324 | 8.230 | 0.340 | 8.636 | 0.396  | 10.058 | 0.325  | 8.252 | 0.3125 | 7.940 |        |       |
| 1   | 0.300 | 7.620 | 0.300 | 7.620 | 0.353  | 8.971  | 0.289  | 7.348 | 0.2813 | 7.150 |        |       |
| 2   | 0.276 | 7.010 | 0.284 | 7.214 | 0.315  | 7.993  | 0.258  | 6.543 | 0.2656 | 6.750 |        |       |
| 3   | 0.252 | 6.401 | 0.259 | 6.579 | 0.280  | 7.122  | 0.229  | 5.827 | 0.2500 | 6.350 |        |       |
| 4   | 0.232 | 5.893 | 0.238 | 6.045 | 0.250  | 6.350  | 0.204  | 5.189 | 0.2344 | 5.950 |        |       |
| 5   | 0.212 | 5.385 | 0.220 | 5.588 | 0.222  | 5.651  | 0.182  | 4.620 | 0.2188 | 5.560 |        |       |
| 6   | 0.192 | 4.877 | 0.203 | 5.156 | 0.198  | 5.032  | 0.162  | 4.115 | 0.2031 | 5.160 |        |       |
| 7   | 0.176 | 4.470 | 0.180 | 4.572 | 0.176  | 4.480  | 0.144  | 3.665 | 0.1875 | 4.760 |        |       |
| 8   | 0.160 | 4.064 | 0.165 | 4.191 | 0.157  | 3.988  | 0.129  | 3.264 | 0.1719 | 4.370 |        |       |
| 9   | 0.144 | 3.658 | 0.148 | 3.759 | 0.140  | 3.551  | 0.114  | 2.906 | 0.1563 | 3.970 | 0.1496 | 3.800 |
| 10  | 0.128 | 3.251 | 0.134 | 3.404 | 0.125  | 3.175  | 0.102  | 2.588 | 0.1406 | 3.570 | 0.1347 | 3.420 |
| 11  | 0.116 | 2.946 | 0.120 | 3.048 | 0.111  | 2.827  | 0.091  | 2.304 | 0.1250 | 3.180 | 0.1197 | 3.040 |
| 12  | 0.104 | 2.642 | 0.109 | 2.769 | 0.099  | 2.517  | 0.081  | 2.052 | 0.1094 | 2.780 | 0.1048 | 2.660 |
| 13  | 0.092 | 2.337 | 0.095 | 2.413 | 0.088  | 2.240  | 0.072  | 1.829 | 0.0938 | 2.380 | 0.0898 | 2.280 |
| 14  | 0.080 | 2.032 | 0.083 | 2.108 | 0.079  | 1.994  | 0.064  | 1.628 | 0.0781 | 1.980 | 0.0748 | 1.900 |
| 15  | 0.072 | 1.829 | 0.072 | 1.829 | 0.070  | 1.775  | 0.057  | 1.450 | 0.0703 | 1.790 | 0.0673 | 1.710 |
| 16  | 0.064 | 1.626 | 0.065 | 1.651 | 0.062  | 1.587  | 0.051  | 1.290 | 0.0625 | 1.590 | 0.0598 | 1.520 |
| 17  | 0.056 | 1.422 | 0.058 | 1.473 | 0.056  | 1.412  | 0.045  | 1.151 | 0.0563 | 1.430 | 0.0540 | 1.370 |
| 18  | 0.048 | 1.219 | 0.049 | 1.245 | 0.050  | 1.257  | 0.040  | 1.024 | 0.0500 | 1.270 | 0.0478 | 1.214 |
| 19  | 0.040 | 1.016 | 0.042 | 1.067 | 0.044  | 1.118  | 0.0359 | 0.912 | 0.0438 | 1.110 | 0.0418 | 1.062 |
| 20  | 0.036 | 0.914 | 0.035 | 0.889 | 0.0392 | 0.996  | 0.0320 | 0.813 | 0.0375 | 0.965 | 0.0359 | 0.912 |
| 21  | 0.032 | 0.813 | 0.032 | 0.813 | 0.0349 | 0.886  | 0.0285 | 0.724 | 0.0344 | 0.873 | 0.0329 | 0.836 |
| 22  | 0.028 | 0.711 | 0.028 | 0.711 | 0.0313 | 0.794  | 0.0253 | 0.643 | 0.0313 | 0.794 | 0.0299 | 0.759 |
| 23  | 0.024 | 0.610 | 0.025 | 0.635 | 0.0279 | 0.707  | 0.0226 | 0.574 | 0.0281 | 0.714 | 0.0269 | 0.683 |
| 24  | 0.022 | 0.559 | 0.022 | 0.559 | 0.0248 | 0.629  | 0.0201 | 0.511 | 0.0250 | 0.635 | 0.0239 | 0.607 |

S.W.G. Standard Wire Gauge

B.S. American Brown and Sharp's Gauge

B.W.G. Birmingham (or Stubs Iron) Wire Gauge

U.S.G. United Standard Gauge

B.G. Birmingham Gauge

M.S.G. United States Manufacturer's Standard Gauge

Note: All information and data have been checked carefully, however Benteler bears no responsibility if there is any discrepancy.

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