



# AE STEEL

## SEAMLESS STEEL PIPE FOR LOW TEMPERATURE SERVICE

### Scope of application

#### Low-temperature service.

Fine grain steel pipes for pressure purposes are used in power engineering and in associated fields of industry. They are used as pipes in elevated pressure installations as well as in installation where it is important to guarantee the appropriate resilience of steel in varying temperature.

### STANDARDS & MATERIAL QUALITY

|            |  |  |
|------------|--|--|
| ASTM A333  | GRADE 1, GRADE 3, GRADE 6                            | <i>P</i> - Steel for Pressure equipments<br>265-Minimum yield strength in N/mm <sup>2</sup><br><i>N</i> -Normalized or normalising formed<br><i>L</i> -Low temperature steel |
| EN 10216-4 | P215NL, P265NL                                       |  |
| EN 10216-3 | P275NL1, P355NL1, P460NL1, P275NL2, P355NL2, P460NL2 |  |

|                        |  |
|------------------------|--|
| <b>Dimension Range</b> | 21.3 mm up to 609.6 mm   |
| <b>Outer Diameter</b>  | ½" up to 24"   |
| <b>Wall Thickness</b>  | 2.3 mm up to 40 mm   |
| <b>Lengths</b>         | - 6 and 12 meters<br>- 5-12m(16.4-39.8 ft) with respect to customer demand for special production<br>- Tolerances: +100/-0mm (+3.94/-0 in) |
| <b>Protection</b>      | - Unprotected<br>- External varnished with black lacquer<br>- plastic caps at both ends  |
| <b>Marking</b>         | According to standard or per customer request for special production   |
| <b>Certification</b>   | Usually they comply with EN 10204 3.1 ( If it is wanted during order for special production then EN 10204 3.2 issued )                     |

| Standards                    | Outer Diameter  | Wall Thickness  |
|------------------------------|---|---|
| EN 10216-4<br>Hot Finished   | ±1.0% or ±0.5 mm (which is higher)  | ±12.5% or ±0.4mm (which is higher)  |
| EN 10216-4,<br>Cold Finished | ±0.5% or ±0.3mm (which is higher)   | ±10% or ±0.2 mm (which is higher)   |
| EN 10216-3<br>Hot Finished   | +/- 1% ya da =/- 0,5mm (which is higher)  | D≤219.1 ± 12.5% or 0.4 mm (which is higher)   |
|                              |   | D>219.1, WT/OD≤ 0.025 -20%, WT/OD>0.025, ≤0.050 -15%  |
|                              |   | WT/OD>0.050, ≤0.10 -12.5%, WT/OD>0.10 -10%  |
| EN 10216-3<br>Cold Finished  | ±0.5%, min.± 0.3 mm   | ±10%, min.±0.2 mm   |
| ASTM A333                    | OD≤48.3; +0.4/-0.8mm 48.3<OD≤114.3; ±0.8mm<br>114.3<OD≤219.1; +1.6/-0.8mm   | +12.5%/-10%   |
| ASTM A334<br>Hot Finished    | OD≤100; +0.4/-0.8mm<br>100<OD≤200; +0.4/-1.2mm<br>200<OD≤225; +0.4/-1.6mm   | OD≤100 and WT≤2.4; +40%/0<br>OD≤100 & 2.4<WT≤3.8; +35%/0<br>OD≤100 & 3.8 <WT≤4.6; +33%/0<br>OD≤100 and WT>4.6; +28%/0<br>OD>100 & 2.4<WT≤3.8; +35%/0<br>OD>100 & 3.8 <WT≤4.6; +33%/0<br>OD>100 & WT>4.6; +28%/0 |
| ASTM A334<br>Cold finished   | OD<25; +0.1/-0.1mm 25≤OD≤40; +0.15/-0.15mm<br>40<OD≤50; +0.2/-0.2mm<br>50≤OD≤65; +0.25/-0.25mm<br>65≤OD≤75; +0.3/-0.3mm<br>75≤OD≤100; +0.38/-0.38mm<br>100<OD≤200; +0.38/-0.64mm<br>200<OD≤225; +0.38/-1.14mm | OD≤38.1; +20%/0 OD>38.1; +22%/0   |

OD: Outer Diameter WT: Wall Thickness

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| CHEMICAL COMPOSITION   |             |       |           |           |          |          |        |           |        | MECHANICAL PROPERTIES |             |                    |                  |          |                  |
|------------------------|-------------|-------|-----------|-----------|----------|----------|--------|-----------|--------|-----------------------|-------------|--------------------|------------------|----------|------------------|
| Standards              | Steel Grade | C max | Si max    | Mn max    | Pmax max | Smax max | Cr max | Ni max    | Mo max | Cu max                | Other       | Yield Strength Mpa | Tensile Strength |          | Elongation min % |
|                        |             |       |           |           |          |          |        |           |        |                       |             |                    | Min. Mpa         | Max. Mpa |                  |
| ASTM A333<br>ASTM A334 | Grade 1     | 0.30  |           | 0.40-1.06 | 0.025    | 0.025    | 0.025  |           |        |                       |             | 205                | 380              |          | 35               |
|                        | Grade 3     | 0.19  | 0.18-0.37 | 0.31-0.64 | 0.025    | 0.025    |        | 3.18-3.82 |        |                       |             | 240                | 450              |          | 30               |
|                        | Grade 6     | 0.30  | min.0.10  | 0.29-1.06 | 0.025    | 0.025    |        |           |        |                       |             | 240                | 415              |          | 30               |
| EN 10216-4             | P215NL      | 0.15  | 0.35      | 0.40-1.20 | 0.030    | 0.020    | 0.30   | 0.30      | 0.08   | 0.30                  | V max 0.02  | 215                | 360              | 480      | 25               |
|                        |             |       |           |           |          |          |        |           |        |                       | Ti max 0.03 |                    |                  |          |                  |
|                        |             |       |           |           |          |          |        |           |        |                       | Al min 0.02 |                    |                  |          |                  |
| EN 10216-3             | P275NL1&NL2 | 0.16  | 0.40      | 0.50-1.50 | 0.025    | 0.020    | 0.30   | 0.50      | 0.08   | 0.30                  | V max 0.05  | 275                | 390              | 530      | 24               |
|                        |             |       |           |           |          |          |        |           |        |                       | Ti max 0.04 |                    |                  |          |                  |
|                        |             |       |           |           |          |          |        |           |        |                       | Al 0.02     |                    |                  |          |                  |
| EN 10216-3             | P355NL1&NL2 | 0.18  | 0.50      | 0.90-1.70 | 0.025    | 0.020    | 0.30   | 0.50      | 0.08   | 0.30                  | V max 0.10  | 355                | 490              | 650      | 22               |
|                        |             |       |           |           |          |          |        |           |        |                       | Ti max 0.04 |                    |                  |          |                  |
|                        |             |       |           |           |          |          |        |           |        |                       | Al 0.02     |                    |                  |          |                  |
| EN 10216-3             | P460NL1&NL2 | 0.20  | 0.60      | 1.00-1.70 | 0.025    | 0.020    | 0.30   | 0.80      | 0.10   | 0.70                  | V max 0.20  | 460                | 560              | 730      | 19               |
|                        |             |       |           |           |          |          |        |           |        |                       | Ti max 0.04 |                    |                  |          |                  |
|                        |             |       |           |           |          |          |        |           |        |                       | Al 0.02     |                    |                  |          |                  |