

## TP 304L • UNS S30403 • 1.4306 • TPS-INOX 4306-304L

Low carbon version of TP 304 guaranteed no creep resistance above 500°C. Good high temperature oxidation resistance up to 900°C. General corrosion characteristics are similar to TP 304. Stability and toughness at cryogenic temperatures is high. Main applications: Pipe and heat exchanger tubes in chemical, petrochemical and food industries.

| Material grade | Norm                     | Chemical composition • mass in % |      |      |       |       |               |               |             |    |            |
|----------------|--------------------------|----------------------------------|------|------|-------|-------|---------------|---------------|-------------|----|------------|
|                |                          | C                                | Si   | Mn   | P     | S     | Cr            | Ni            | Mo          | Ti | Sonst.     |
|                |                          | max.                             | max. | max. | max.  | max.  | min. – max.   | min. – max.   | min. – max. |    |            |
| 1.4306         | EN 10216-5               | 0,030                            | 1,00 | 2,00 | 0,040 | 0,015 | 18,00 - 20,00 | 10,00 - 12,00 | -           | -  | N 0,10 max |
| TP304L         | ASME SA / AS<br>TM A 213 | 0,035                            | 1,00 | 2,00 | 0,045 | 0,030 | 18,00 - 20,00 | 8,00 - 12,00  | -           | -  | -          |

| Material grade | Norm                     | Mechanical properties and heat treatment |              |             |       |          |                 |
|----------------|--------------------------|--|--------------|-------------|-------|----------|-----------------|
|                |                          | Rp 0,2 [MPa]                             | Rp 1,0 [MPa] | Rm [MPa]    | A [%] | Härte    | Wärmebehandlung |
|                |                          | min.                                     | min.         | min. – max. | min   | HRB max. |                 |
| 1.4306         | EN 10216-5               | 180                                      | 215          | 460 - 680   | 40    | -        | lösungsgeglüht  |
| TP304L         | ASME SA / AS<br>TM A 213 | 170                                      | -            | 485         | 35    | 90       | lösungsgeglüht  |

| Tolerances       |           |           |            |           |
|------------------|-----------|-----------|------------|-----------|
| AD - Rohr        | AD        | WD        | special WT | ID        |
| ab Ø4,550 mm     | ±0,050 mm | ±0,150 mm | ±0,100 mm  | X         |
| ab Ø9,530 mm     | ±0,050 mm | ±0,100 mm | ±0,080 mm  | ±0,050 mm |
| ab Ø30,001 mm*** | ±0,100 mm | ±0,150 mm |            | ±0,050 mm |

\*\*\* to max. ø44,500 mm

- Tolerances acc. to DIN EN 10305-1 can be confirmed to OD 30mm
- Tolerances acc. to DIN EN ISO 1127 / DIN EN 10216-5 can be confirmed
- Tolerances acc. to ASTM can be confirmed generally

Abmessungsbereich\*

Abmessungsspektrum

| AD    | WD     | [mm]   | 0,89  | 1,00 | 1,20 | 1,24  | 1,65  | 1,82  | 2,00 | 2,11  | 2,30 | 2,35  | 2,50 | 2,60 | 2,64  | 2,77  | 2,87  | 3,00 | 3,20  | 3,25  | 3,60 | 3,85 | 3,91  | 4,00 | 4,40 | 5,50 | 6,35  | 7,00 |
|-------|--------|--------|-------|------|------|-------|-------|-------|------|-------|------|-------|------|------|-------|-------|-------|------|-------|-------|------|------|-------|------|------|------|-------|------|
| [mm]  | [inch] | [inch] | 0,035 |      |      | 0,048 | 0,065 | 0,072 |      | 0,083 |      | 0,093 |      |      | 0,104 | 0,109 | 0,113 |      | 0,126 | 0,128 |      |      | 0,154 |      |      |      | 0,250 |      |
| 6,00  |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 6,35  | 0,250  |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 7,00  |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 7,50  |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 8,00  |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 9,00  |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 9,53  | 0,375  |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 10,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 11,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 12,70 | 0,500  |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 13,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 15,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 15,88 | 0,625  |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 16,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 16,80 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 17,15 | 0,675  |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 18,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 19,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 19,05 | 0,750  |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 20,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 21,34 | 0,840  |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 22,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 22,23 | 0,875  |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 23,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 25,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 25,40 | 1,000  |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 26,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 26,67 | 1,050  |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 28,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 30,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 31,75 | 1,250  |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 32,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 33,40 | 1,315  |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 36,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 38,10 | 1,500  |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 42,00 |        |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |
| 44,50 | 1,750  |        |       |      |      |       |       |       |      |       |      |       |      |      |       |       |       |      |       |       |      |      |       |      |      |      |       |      |

