

## TP 904L • UNS N08904 • 1.4539 • TPS-Technichromo 904L

This high-alloy austenitic is very resistant to attack from diluted sulphuric acid, phosphoric acid and acetic acid. It resists pitting in neutral chloride solutions. Its resistance to stress corrosion cracking in some hot chlorides is much superior to that of the lower nickel austenites. This steel has good formability and weldability. This material is present in all common standards like ASTM and EN, however with some differences. Design stresses up to 370°C are included in ASME II.

| 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. |    |                                   |
| 1.4539         | EN 10216-5 | 0,020                            | 0,70 | 2,00 | 0,030 | 0,010 | 19,00 - 21,00 | 24,00 - 26,00 | 4,00 - 5,00 | -  | Cu 1,20 – 2,00; N 0,15 max.       |
| 1.4539         | VD-TÜV 421 | 0,020                            | 0,70 | 2,00 | 0,030 | 0,015 | 19,00 - 21,00 | 24,00 - 26,00 | 4,00 - 5,00 | -  | Cu 1,20 – 2,00; N 0,04 -0,15 max. |
| N08904         | ASTM A 213 | 0,020                            | 1,00 | 2,00 | 0,040 | 0,030 | 19,00 - 23,00 | 23,00 - 28,00 | 4,00 - 5,00 | -  | Cu 1,00 – 2,00; N 0,10 max.       |

| 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. |                 |
| 1.4539         | EN 10216-5 | 230                                      | 250          | 520 - 720   | 35    | -        | lösungsgeglüht  |
| 1.4539         | VD-TÜV 421 | 230                                      | 260          | 530 - 720   | 35    | -        | lösungsgeglüht  |
| N08904         | ASTM A 213 | 215                                      | -            | 490         | 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]   | 1,00 | 1,20 | 1,24  | 1,30 | 1,40 | 1,50 | 1,60 | 1,65  | 1,82  | 2,00 | 2,11  | 2,20 | 2,30 | 2,35  | 2,41  | 2,64  | 2,77  | 2,80 | 3,00 | 3,20  | 3,25  | 3,50 | 3,60 | 3,85 | 3,91  | 4,00 |  |
|-------|--------|--------|------|------|-------|------|------|------|------|-------|-------|------|-------|------|------|-------|-------|-------|-------|------|------|-------|-------|------|------|------|-------|------|--|
| [mm]  | [inch] | [inch] |      |      | 0,048 |      |      |      |      | 0,065 | 0,072 |      | 0,083 |      |      | 0,093 | 0,095 | 0,104 | 0,109 |      |      | 0,126 | 0,128 |      |      |      | 0,154 |      |  |
| 8,00  |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 9,00  |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 9,53  | 0,375  |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 10,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 11,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 12,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 12,70 | 0,500  |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 13,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 14,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 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  |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 21,40 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 22,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 22,23 | 0,875  |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 23,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 24,30 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 25,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 25,20 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 25,40 | 1,000  |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 26,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 26,67 | 1,050  |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 28,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 30,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 31,75 | 1,250  |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 32,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 33,40 | 1,315  |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 35,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 36,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 38,00 |        |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |
| 38,10 | 1,500  |        |      |      |       |      |      |      |      |       |       |      |       |      |      |       |       |       |       |      |      |       |       |      |      |      |       |      |  |

