

Material Grade: **UNS17400 (17-4PH)**
 Material Condition: **Solution Annealed and Double Aged**
 Surface Finish: **Turned/ Peeled**

Associated Standard: **ASTM A564 (Grade 630)**
NACE MR0175/ISO15156 (condition DH1150)

Description:

17-4PH is a precipitation hardening stainless steel with excellent corrosion resistance, superior to martensitic grades such as 431 and 410, and comparable to austenitic grade 304. It is heat treated by age hardening and has the potential for very high strengths (between 40-47HRC in the H900 condition).

The ageing process should be controlled as it may affect the materials corrosion resistance. Arc and resistance welding processes used on standard grades of stainless steel are applicable to 17-4PH stainless steel. The low hardness enables sections up to 100mm to be welded without pre heating.

Typical applications: **Valve internals, stems, shafts, gates, seats and seal rings, tubing hangers.**

1. STEELMAKING

Method/ Refining: **Electric Arc Furnace followed by AOD/VOD/VDG**
 Grain Size: **5-8**
 Min. reduction ratio: **4:1 min (typically 3:1 on sections > 300mm)**

| | <u>C</u> | <u>Si</u> | <u>Mn</u> | <u>S</u> | <u>P</u> | <u>Cr</u> | <u>Ni</u> | <u>Mo</u> | <u>Cu</u> | <u>Nb</u> | <u>Ta</u> | <u>Nb+Ta</u> |
|-----|----------|-----------|-----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|--------------|
| Min | | | | | | 15.00 | 3.00 | | 3.00 | 0.15 | | 5 x C |
| Max | 0.07 | 1.00 | 1.00 | 0.025 | 0.025 | 17.00 | 5.00 | 0.5 | 5.00 | 0.45 | 0.05 | 0.45 |

2. TYPICAL MECHANICAL PROPERTIES

| Test type | | | Tensile and hardness test (at room temperature) | | | | | | Impact test (KV) | |
|--|------------|------|---|-------------|----------|-----------|------------|----------|------------------|-------|
| | | | Yield (Re) | 0.2 % proof | UTS (Rm) | Elong (A) | R of A (Z) | Hardness | RT | -46°C |
| Variation | Sample dia | Unit | KSI | KSI | KSI | % | % | HRc (HB) | J | J |
| Solution annealed (A) | | Min | | | | | | 38 (363) | | |
| | | Max | | | | | | 36 (336) | | |
| Solution annealed and double aged (DH1150) | | Min | | 105 | 135 | 18 | 55 | 29 (279) | 54 | 46 |
| | | Max | | | 160 | | | 32 (311) | | |

3. INSPECTION

NDT procedure: **ASTM A388/A388M**
 Acceptance Standard **API 6A PSL Level 3**