| **Quality** | **X6Cr17** | **Ferritic Stainless Steel** | *Technical card 2018* |
|---|---|---|---|
| Number | **1.4016** | | *Lucefin Group* |

## Chemical composition

| **C%** max | **Si%** max | **Mn%** max | **P%** max | **S%** [a] max | **Cr%** | |
|---|---|---|---|---|---|---|
| 0,08 | 1,00 | 1,00 | 0,040 | 0,030 | 16,0-18,0 | EN 10088-3: 2014 |
| ± 0.01 | + 0.05 | + 0.03 | + 0.005 | ± 0.005 | ± 0.2 | |

Product deviations are allowed

[a] for improving polishability, it is suggested a controlled sulphur content of max 0,015 %

## Temperature °C

| **Melting range** | **Hot-forming** | **Recrystallization +RA** | **Soft annealing +A** |
|---|---|---|---|
| 1510-1425 | 1120-850 | 810-700 cooling to 300, then air | 850-750 air |

| **Isothermal annealing +I** | **Quenching +Q** | **Tempering +T** |
|---|---|---|
| not suitable | not suitable | not suitable |

MMA **welding -** AWS electrodes

| *pre-heating* | *annealing after w.* |
|---|---|
| 200 | 800-750 |

*joint with steel*

| carbon | CrMo alloyed | stainless |
|---|---|---|
| E60 xx | E8018-B 2 | E309 – E308 |

*cosmetic welding*

E430

**Chemical treatment** ▪ *Pickling* (15 - 25% $HNO_3$) + (1 - 8% HF) hot or cold

## Mechanical properties

**Heat-treated material** EN 10088-3: 2014 in conditions 1C, 1E, 1D, 1X, 1G, 2D

| size | | Testing at room temperature | | | | | |
|---|---|---|---|---|---|---|---|
| mm | | **R** | **Rp** 0.2 | **A**% | **Kv₂** +20 °C | **HBW** [a] | [a] for information only |
| from | to | N/mm² | N/mm² min | min | J min | max | |
| | 100 | 400-630 | 240 | 20 | - | 200 | +A annealed material |

**Bright bars of heat-treated material** EN 10088-3: 2014 in conditions 2H, 2B, 2G, 2P

| size | | Testing at room temperature | | | | | | |
|---|---|---|---|---|---|---|---|---|
| mm | | **R** | **HBW** | **R** | **Rp** 0.2 | **A**% | **Kv₂** +20 °C | |
| from | to | N/mm² max | max | N/mm² | N/mm² min | min | J min | |
| | 10 [b] | - | - | 500-750 | 320 | 8 | - | |
| 10 | 16 | - | - | 480-750 | 300 | 8 | - | |
| 16 | 40 | - | - | 400-700 | 240 | 15 | - | |
| 40 | 63 | - | - | 400-700 | 240 | 15 | - | |
| 63 | 100 | - | - | 400-630 | 240 | 20 | - | |
| | | | | +A annealed material | | | | |

[b] in the range of 1 mm ≤ d < 5 mm, values are valid only for rounds – the mechanical properties of non round bars of < 5 mm of thickness have to be agreed at the time of request and order

**Forged** UNI EN 10250-4: 2001

| size | | Testing at room temperature | | | | | |
|---|---|---|---|---|---|---|---|
| mm | | **R** | **Rp** 0.2 | **A**% | **Kv** +20 °C | **HB** | |
| from | to | N/mm² | N/mm² min | min | J min | max | |
| | 100 | 400-630 | 240 | - | - | 200 | +A annealed material |

Effect of **cold-working** (hot-rolled +RA+C). Approximate values

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **R** | N/mm² | 550 | 620 | 680 | 700 | 720 | 770 | 790 | 820 | 860 |
| **Rp** 0.2 | N/mm² | 320 | 500 | 590 | 620 | 650 | 680 | 700 | 750 | 800 |
| **A** | % | 22 | 11 | 10 | 9 | 9 | 9 | 9 | 9 | 9 |
| Reduction | **%** | **0** | **10** | **20** | **30** | **40** | **50** | **60** | **70** | **75** |

**Minimum values at high temperatures** EN 10088-3: 2014

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Rp** 0.2 | N/mm² | 220 | 215 | 210 | 205 | 200 | 195 | 190 | +A annealed |
| Test at | **°C** | **100** | **150** | **200** | **250** | **300** | **350** | **400** | |

X6Cr17 **n° 1.4016** ferritic steel *Lucefin Group*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Thermal expansion** | $10^{-6} \cdot K^{-1}$ ► | 10.0 | 10.5 | 10.5 | 10.5 | 11.0 | 12.0 | |
| **Modulus of elasticity** | longitudinal GPa | 220 | 215 | 210 | 205 | 195 | | |
| **Poisson number** | *v* | 0.144 | 0.138 | | | | | |
| **Electrical resistivity** | $\Omega \cdot mm^2/m$ | 0.60 | | 0.77 | | 0.93 | 1.05 | 1.25 |
| **Electrical conductivity** | Siemens•m/mm² | 1.67 | | | | | | |
| **Specific heat** | J/(Kg•K) | 460 | | 495 | | 570 | 660 | 760 |
| **Density** | Kg/dm³ | 7.70 | | | | | | |
| **Thermal conductivity** | W/(m•K) | 25 | | | | | | |
| **Relative magnetic permeability** | μr | 600-1000 ~ | | | | | | |
| **°C** | | **20** | **100** | **200** | **300** | **400** | **600** | **800** |

The symbol ► indicates between 20 °C and 100 °C, 20 °C and 200 °C .....

| **Corrosion resistance** | Atmospheric | | Chemical | | | **x** phenol, food, detergents, weak organic acids |
|---|---|---|---|---|---|---|
| Fresh water | *industrial* | *marine* | *medium* | *oxidizing* | *reducing* | |
| **x** | **x** | | **x** | **x** | | |

| | |
|---|---|
| **Magnetic** | yes |
| **Machinability** | good |
| **Hardening** | cold-drawing and other cold plastic deformations |
| **Service temperature in air** | up to 800 °C continuous service and up to 875 °C intermittent service |

| **Europe** EN | **USA** UNS | **USA** ASTM | **China** GB | **Russia** GOST | **Japan** JIS | **India** IS | **Republic of Korea** KS |
|---|---|---|---|---|---|---|---|
| X6Cr17 | S43000 | **430** | 1Cr17 | 12Ch17 | SUS 430 | X07Cr17 | STS 430 |

*Architectural element*