

Abbreviated Name	EN Norm	ASTM / AISI	AFNOR	DIN Abbreviation	ISO	Other
X2CrNiMoCuS17-10-2	1.4598	316 L+S+Cu	Z3CND18.12.2+S+Cu	1.4598		Ca. 316F

1.4598 Wire

Chemical analysis by European Norm EN 10088-1 in mass percent

C	Si	Mn	P	S	N	Cr	Cu
≤ 0.07	≤ 1.00	≤ 2.00	0.045	0.10-0.25	≤ 0.11	16.5-18.5	1.30-1.80
Mo	Ni	Fe					
2.00-2.50	10.0-13.0	Remainder					

Diameter 0.02 – 4.00 mm

Application

1.4598 is categorized as stainless, austenitic steel. It is similar to the material 1.4435, but is additionally alloyed with sulfur and copper. 1.4598 is grouped with austenitic chrome, nickel and molybdenum steels like: 1.4404, 1.4571 or 1.4435. Due to the added sulfur and copper, 1.4598 is easily machined with cutting tools. 1.4598 is used mainly in turning parts which require precision as well as high corrosion resistance.

Resistance to Corrosion

Although the level of resistance to corrosion of 1.4598 is good, as a result of the added sulfur, it no longer compares to that of 1.4435. The added sulfur permits simplified machining with cutting tools, but it also makes 1.4598 more susceptible to pitting and crevice corrosion. Owing to the molybdenum content however, 1.4598 does remain durable in acids.

Thermal Treatment / Weldability

Optimal material properties are achieved through annealing between 1050°C and 1100°C, followed by rapid cooling. If possible, the temperature range 400°C to 900°C should be avoided since chrome carbides can form in the microstructure in these temperatures. When that occurs, the material becomes susceptible to intergranular corrosion. Like all austenitic materials, 1.4598 cannot be hardened through traditional thermal treatment processes. Instead it is hardened through cold working.

The welding of 1.4598 is discouraged since the high sulfur content causes the beads to form porously, making them prone to forming cracks and fissures.

Surface Finish

Drawn	Chemically purged	0.020 – 3.499 mm
Surface Ground	Chemically purged	3.500 – 4.000 mm

Delivery mode

As a ring
On assorted spools
Straightened
Axles

Diameter tolerances

Diameter (mm)	Tolerance (%)	Tolerance (μ)
0.020 – 0.249		± 1.0
0.250 – 0.399		± 1.5
0.400 – 1.500		± 2.0
1.500 – 4.000		± 2.5

Mechanical Properties

Condition at delivery (mm)	Ultimate Tensile Strength in cold-twisted delivery condition (N/mm ²)
0.005 – 0.019	600 - 1200 (Depends on the Diameter)
0.020 – 0.199	
0.200 – 0.499	
0.500 – 0.999	
1.000 – 1.999	
2.000 – 4.000	

Physical Properties

Density		8.00 g/cm ³
Coefficient of Thermal Expansion	20 °C – 200 °C	17.30 10 ⁻⁶ /K
Specific Heat Capacity	20 °C	500.00 J/kgK
Thermal Conductivity	20 °C	14.6 W/mK
Specific Electric Resistance	20 °C	0.73 Ω mm ² /m
Young's Modulus	20 °C	200.00 GPa

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