

## Material Data Sheet

### 1.4539 (X1NiCrMoCu25-20-5)

### Superaustenitic corrosion-resistant stainless steel

**Short description** 1.4539 possesses excellent resistance to many organic and inorganic acids. Due to its high molybdenum content, this grade also offers good resistance to stress corrosion cracking and pitting. 1.4539 is seawater-resistant.

<b>Standards and Designations</b>	EN	1.4539
	DIN	X1NiCrMoCu25-20-5
	AISI	904L
	UNS	N08904

#### Chemical Composition

	<b>C</b> (Carbon)	<b>Mn</b> (Mangan)	<b>Si</b> (Silicium)	<b>P</b> (Phosphor)	<b>S</b> (Sulfur)	<b>Cr</b> (Chrome)	<b>Ni</b> (Nickel)	<b>Mo</b> (Molybdenum)	<b>N</b> (Nitrogen)	<b>CU</b> (Copper)
min.	-	-	-	-	-	19,0	24,0	4,0	-	1,2
max.	0,02	2,0	0,7	0,030	0,010	21,0	26,0	5,0	0,15	2,0

<b>General Properties</b>	corrosion resistance	excellent
	mechanical properties	good
	forgeability	medium
	weldability	good
	machinability	medium

**Special Features** Polishable  
Usable from -60°C to 400°C

**Corrosion resistance** 1.4539 is resistant to intergranular corrosion both in its as-supplied condition and after welding. 1.4439 can be used in chloride-containing or halogen-contaminated media, sulfuric or phosphoric acids, and seawater. (PREN = 32.2 – 39.9)

#### Mechanical Properties at 20°C

Hardness HB	Yield strength Rp0,2 N / mm <sup>2</sup>	Tensile strength Rm N / mm <sup>2</sup>	Stretching A5,65	Elastic modulus kN / mm <sup>2</sup>
≤ 230	≥ 230	530 - 730	≥ 30%	195

**Forgeability** During the forging process, the material is first slowly heated to approximately 1150°C – 1180°C. Forging takes place in a temperature range of 1180°C – 950°C. This is followed by air or water cooling. Corrosion resistance is reduced by scale and tarnish, which should be removed by chemical or mechanical processes.

#### BANKVERBINDUNGEN

OLDENBURGER VOLKSBANK  
 IBAN DE98 2806 1822 0065 3616 00  
 BIC GENODEF1EDE

LZO RASTEDE  
 IBAN DE07 2805 0100 0043 3308 93  
 BIC SLZODE22XXX

OLB RASTEDE  
 IBAN DE54 2802 0050 1443 1738 00  
 BIC OLBODEH2XXX

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#### FIRMENKENNUNG

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**Weldability** 1.4539 can be welded using all common welding processes. However, without the use of filler metal, hot cracking may occur. Duplex materials (1.4462) or nickel alloys should be used as welding consumables. However, the welding consumables cause the corrosion properties of the weld to differ from those of the base material. Final heat treatment is not required.

**Application areas** Apparatus engineering, construction industry, chemicals, petrochemicals, energy technology, onshore and offshore, fertilizer production, pharmaceuticals, shipbuilding, environmental technology (flue gas desulfurization), pulp industry

**Physical Properties at 20°C**

Density kg/dm <sup>3</sup>	Electrical resistance (ohm) mm <sup>2</sup> /m	Magnetizability	Thermal conductivity W/m K	Specific heat capacity J/kg K
8,0	1,0	gering	12	450

**Processing**

cold forming	yes
cold heading	not common
polishability	yes
open-die and drop forging	yes
machining	moderate

**Thermal treatment**

Solution annealing (+AT)	1050 - 1150°C (cooling: water or air)
Hot forming	1200 - 900°C (cooling: air)

**Notice** The values and information listed above regarding the properties and/or usability of the material are for informational purposes only. This information is based on the manufacturer's experience.

All information is provided without guarantee. Subject to printing errors, mistakes, and changes.