

Data sheet

1.4828 (X15CrNiSi20-12)

Austenitic heat-resistant stainless steel

Short description 1.4828 or AISI 309 is a heat-resistant austenitic chromium-nickel steel. This material, like 1.4713, is a standard grade in furnace construction. However, 1.4828 has been significantly improved in its scaling resistance compared to 1.4713. When special requirements are placed on mechanical properties, 1.4828 delivers good results due to its high tensile strength at elevated temperatures.

Standards and Designations

EN	1.4828
DIN	X15CrNiSi20-12
AISI	309
UNS	S30900

Chemical Composition

	C (Carbon)	Mn (Mangan)	Si (Silicium)	P (Phosphor)	S (Sulfur)	Cr (Chrome)	Ni (Nickel)	N Nitrogen
min.	-	-	1,5	-	-	19,0	11,0	-
max.	0,20	2,0	2,5	0,045	0,015	21,0	13,0	0,11

General Properties

Corrosion resistance:	low
Mechanical properties:	medium
Forgeability:	good
Welding properties:	good
Machinability:	good

Special Features

Heat-resistant (application range 800°C – 1000°C)
Scaling-resistant up to 1000°C in air

Corrosion resistance

1.4828 exhibits only low resistance to oxidizing and reducing sulfur-containing gases, limiting its use in such media up to 650°C. Furthermore, above 900°C, the material 1.4828 has only limited corrosion resistance to carburizing gases or low-oxygen gases with nitrogen content.

Mechanical Properties at 20°C

Hardness HB	Yield strength Rp _{0,2} N / mm ²	Tensile strength R _m N / mm ²	Stretching A _{5,65}	Elastic modulus kN / mm ²
≤ 223	≥ 230	550 - 750	≥ 30%	196

Forgeability Forging takes place in a temperature range of 1150°C – 800°C. Rapid air or water cooling then takes place.

Weldability 1.4828 can be welded using all common welding processes. Preheating prior to welding and post-welding heat treatment are not necessary.

Machinability 1.4828 is prone to carbides forming during machining. This increases wear on cutting tools, which is why high-quality tools should be used. Due to its tendency to work hardening and poor thermal conductivity, adequate cooling should be ensured. Cutting speeds and depths of cut should be kept low accordingly.

Application areas Apparatus construction for high-temperature applications, automotive industry, construction industry, chemicals, petrochemicals, chain industry, furnace construction, sieves and grates, cement industry

**Physical Properties
at 20°C**

Density kg/dm ³	Electrical Resistance (ohm) mm ² /m	Magnetizability	Thermal conductivity W/m K	Specific heat capacity J/kg K
7,9	0,85	not available	15	500

Thermal treatment Solution annealing (+AT) 1050 - 1150°C (cooling: water or air)

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