NIROSTA® 4462

Material no.	1.4462 to EN 10 088-2		
Code names	D	(DIN/EN)	X 2 CrNiMoN 22-5-3
	USA	(ASTM)	S 31803
	Japan		SUS 329 J3L
	CIS		–

Chemical composition (in % by weight)

	C	Cr	Mo	Ni	N	Mn
min.	–	21.0	2.5	4.5	0.10	–
max.	0.03	23.0	3.5	6.5	0.22	2.0

Product forms

Hot-rolled wide strip, cold-rolled wide strip, slit strip, cut sheets, circles, blanks, precision strip

Mechanical properties (transverse samples) at room temp. to EN 10 088-2

Dimensions range	$R_{p\,0.2}$ (0.2% yield strength) N/mm²	R_m (tensile strength) N/mm²	A_{80} (elongation) %
Cold-rolled strip s ≤ 8 mm	≥ 500	700 to 950	≥ 20
Hot-rolled strip s ≤ 13.5 mm	≥ 460	700 to 950	≥ 25

Minimum properties at elevated temperatures

Temperature °C	100	150	200	250
$R_{p\,0.2}$ (0.2% yield strength) N/mm²	360	335	315	300

Heat treatment

Annealing temperature °C	Time min	Cooling	Microstructure
1020 – 1100	~ 5/mm thickness	Water/air	Ferritic-austenitic

Physical properties

Density kg/dm³	Modulus of elasticity in kN/mm² at 20 °C	100 °C	200 °C	300 °C	Thermal expansion in $10^{-6} \cdot K^{-1}$ between 20 °C and 100 °C	200 °C	300 °C
7.8	200	194	186	180	13.0	13.5	14.0

Thermal conductivity at 20 °C W/m · K	Specific heat capacity at 20 °C J/kg · K	Electrical resistivity at 20 °C Ω · mm²/m	Magnetisability
15	500	0.80	present

Surface finish

1 D (II a), 2 B (III c)

Edge finish

Untrimmed, cut edges, dressed edges on request

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Chemical resistance

Our publication "Chemical Resistance of NIROSTA® Steels" contains tables giving some guide to chemical resistance.

In addition, see our publication on "NIROSTA® 4462 – ferritic-austenitic duplex steel with high strength and corrosion resistance".

Processing

NIROSTA® 4462 can be cold formed (e.g. bending, flanging, spinning and deep drawing). Sharp bends should be carried out transverse to the rolling direction. NIROSTA® 4462 exhibits a lower tendency to strain hardening than the austenitic stainless steels. The higher mechanical values, however, mean that higher forces are required to form the material. Post heat treatment is unnecessary where the percent reduction is below 10% and after welding.

Heat tints from heat treatment or welding reduce corrosion resistance and should be removed chemically (e.g. pickling baths or pickling pastes) or mechanically (e.g. by grinding or blasting with glass beads or iron- and sulfur-free quartz sand).

Machining is possible under the parameters used for austenitic steels, although NIROSTA® 4462 is less prone to gumming.

NIROSTA® 4462 can be polished.

Welding

Weldability:
NIROSTA® 4462 can be readily welded by all methods (except gas welding).

Filler metals:

Material no.	1.4462	1.4501
THERMANIT®	22/09	25/07 Cu T

Approvals: This material and the filler metal are approved for use in the construction of pressure vessels.

Applications

Due to its good mechanical properties, high resistance to general corrosion, stress corrosion cracking, corrosion fatigue, pitting and crevice corrosion, NIROSTA® 4462 is suitable for many applications in the chemical and petrochemical industries, for storage and transport containers for aggressive media, in seawater desalination plants and in off-shore technology, e.g. for sour gas pipelines and for load-bearing structures.

The material 1.4462 is approved for use in pressure vessels in the temperature range –10 °C to +280 °C.