



SINOXX^{...} 4501

SUPER DUPLEX STAINLESS STEEL

SINOXX 4501 is a standardized super duplex stainless grade for service in aggressive chloride-containing environments with additions of W and Cu compared to basic S32750 super duplex. It is characterized by high resistance to pitting and crevice corrosion, high resistance to stress corrosion cracking, excellent resistance to intergranular corrosion, and high mechanical strength.

APPLICATIONS

- heat exchangers
- desalination plants
- oil and gas industry equipment
- structural components
- pulp and paper
- offshore platforms

SPECIFICATIONS

Super duplex stainless steel is designated as UNS S32760 and W. Nr. 1.4501, and conforms to the following standards:

- ASTM A240, ASTM A480
- EN 10088-1, EN 10088-2, EN 10028-7

CHEMICAL COMPOSITION

Typical values [wt. %]

	C	Mn	P	S	Si	Cr	Ni	Mo	N	Cu	W
Min.	-	-	-	-	-	25.20	6.80	3.60	0.25	0.55	0.55
Max.	0.030	0.90	0.030	0.0003	0.40	25.50	7.10	3.80	0.27	0.70	0.70

$PREN = (Cr\%) + 3.3 (Mo\% + 0.5W\%) + 16 (N\%) \geq 41$

PHYSICAL PROPERTIES

Density	Specific heat	Thermal conductivity	Electrical resistivity
7.8 g/cm ³	500 J/kgK*	15 W/mK*	0.8 Ωmm/m*

* values at 20 °C according to EN 10088-1

MECHANICAL PROPERTIES

Minimum guaranteed values of mechanical test requirements, for the specified thickness range.

Thickness [mm]	0.2 % Yield strength min. [MPa]	Tensile strength min. [MPa]	Elongation min. [%]	Hardness max. [HB]	Impact Charpy V, 20 °C [J]*
9.5–25.4	550	750	25	310	200–300

* typical value

MICROSTRUCTURE

The microstructure of SINOXX 4501 is ferritic-austenitic with ratio close to 50:50. The typical microstructure is shown in *Figure 1*.

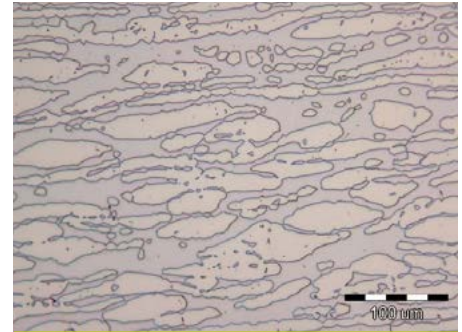


Figure 1: Ferritic-austenitic microstructure, ratio approx. 50:50

CORROSION RESISTANCE

The high chromium and molybdenum content in SINOXX 4501 make it extremely resistant to uniform corrosion. The duplex structure provides excellent resistance to chloride stress corrosion cracking (SCC). SINOXX 4501 is also highly resistant to carbide-related intergranular corrosion. This grade performs best in HCl with Cu and W additions, where it has been shown to be acceptable for a number of applications previously thought unsuitable for stainless steel.

HOT FORMING

The hot forming temperature range is between 1000 °C and 1150 °C (1832–2102 °F).

HEAT TREATMENT

Solution annealing at 1100 °C (2012 °F), followed by rapid cooling.

PICKLING

Plates are supplied in pickled condition (bright surface).

DIMENSIONS

SINOXX 4501	Thickness [mm]	Max. width [mm]	Max. length [mm]	Max. weight [kg]
Quarto plates	9.5–12.7 (0.37–0.5 in.)	2000 (78.74 in.)	12000 (472.44 in.)	9600 (21164 lbs)
Quarto plates	12.7–25.4 (0.5–1.0 in.)	2300 (90.55 in.)	12000 (472.44 in.)	9600 (21164 lbs)

The information and data in this product data sheet are intended for informative purpose only and may be revised at any time without notice. Presented typical properties of the materials are described only to help readers make their own evaluations and decisions. They are not guaranteed.