NASXM-19 (UNS S20910)

High Strength, High Corrosion Resistance Stainless Steel

NASXM-19 is a nitrogen-strengthened austenitic stainless steel with excellent corrosion resistance. In comparison with Type 316L, NASXM-19 provides higher corrosion resistance and higher strength. Nippon Yakin supplies this product in plate, sheet and strip forms.

Steel Grade/Standard

Nippon Yakin Grade	JIS	ASTM A240
NASXM-19	—	UNS S20910

Chemical Composition

[wt %]

	C	Si	Mn	P	S	Ni	Cr	Mo	Nb	V	N
Specification (UNS S20910)	≦0.06	≦0.75	4.00~ 6.00	≦0.040	≦0.030	11.5~ 13.5	20.5~ 23.5	1.50~ 3.00	0.10~ 0.30	0.10~ 0.30	0.20~ 0.40

Physical Properties

Density	[g/cm^3]		7.88
Specific heat	[J/kg · K]		487
Electrical resistivity	[μΩ · cm]		81
Thermal conductivity	[W/m · K]		13.2
Average coefficient of thermal expansion	[10^{-6}/°C]	24~100°C	15.8
		24~200°C	16.4
		24~300°C	16.9
		24~400°C	17.3
Young's modulus	[MPa]		19.8 × 10^4
Magnetism			None
Melting range	[°C]		1380~1406

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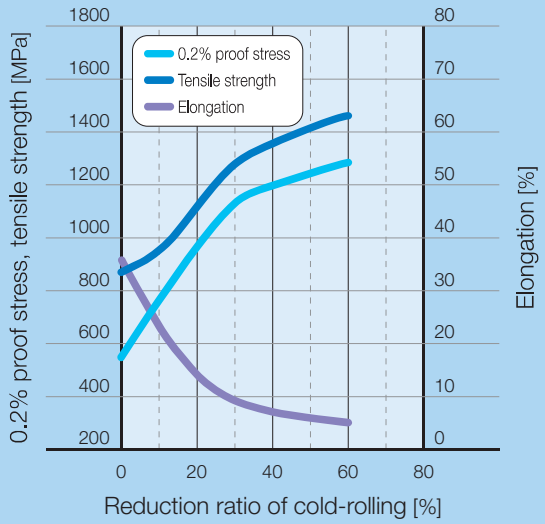
Mechanical Properties

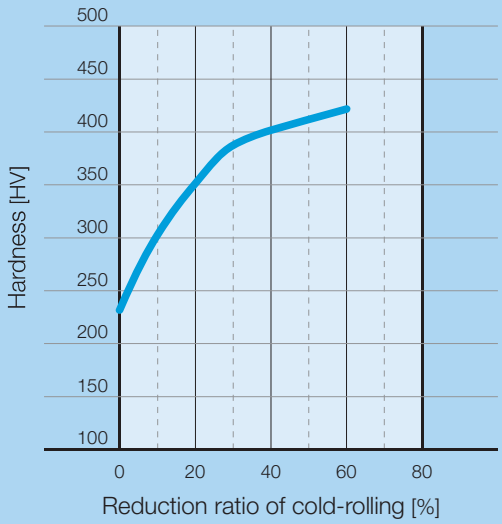
Mechanical Properties at Room Temperature

		0.2% proof stress [MPa]	Tensile strength [MPa]	Elongation [%]	Hardness [HBW]
Specification: Hot-rolled plate (UNS S20910)		≧380	≧690	≧35	≦241
Example	Hot-rolled plate 7mm^t	460	805	41	219

		0.2% proof stress [MPa]	Tensile strength [MPa]	Elongation [%]	Hardness [HRBW]
Specification: Cold-rolled sheet (UNS S20910)		≧415	≧725	≧30	≦100
Example	Cold-rolled sheet 0.8mm^t	527	856	36	97

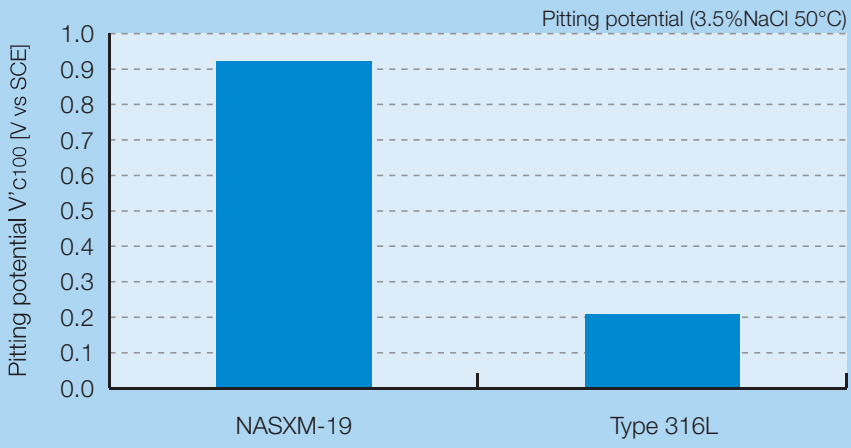
Work Hardening





Corrosion Resistance

NASXM-19 possesses higher corrosion resistance than Type 316L.



Workability

Hot and cold workability are substantially the same as other austenitic stainless steels. However, in both hot working and cold working, the fact that this is a high strength material must be considered.

Weldability

Welding is possible by TIG, MIG, and shielded metal arc welding in the same manner as with standard austenitic stainless steels. ER209 welding rods, which have the same composition, are frequently used.

Heat Treatment

Solution annealing of NASXM-19 is normally performed at the temperature range from 1065 to 1120°C followed by being quenched in water or rapidly cooled by other means.

Pickling

A mixture of nitric acid and fluoric acid is used in pickling. However, because descaling is somewhat difficult in comparison with Type 304, alkali immersion before acid pickling, and if possible, shot blasting are extremely effective.

Applications

Chemical plants, Spent nuclear fuel containers (casks).

For more information, please contact:
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