

NAS 255 (UNS N08904)

NAS High Corrosion Resistant Stainless Steel

NAS 255 (UNS N08904, SUS 890L) is an austenitic stainless steel with superior corrosion resistance in comparison with Type 316L and Type 317L. Due to addition of Cu (1.5%), this material displays excellent corrosion resistance against reducing acids such as sulfuric acid and phosphoric acid. It is used in chemical plants and a wide range of other applications. Nippon Yakin supplies this product in plate, sheet and strip form.

Steel Grade/Standard

NAS	JIS G4304/4305	ASTM A240	EN
NAS 255	SUS 890L	UNS N08904	1.4539

Chemical Composition

	C	Si	Mn	P	S	Ni	Cr	Mo	Cu	N	[wt %]
Specification (SUS 890L)	≤0.020	≤1.00	≤2.00	≤0.045	≤0.030	23.00~28.00	19.00~23.00	4.00~5.00	1.00~2.00	—	
Specification (UNS N08904)	≤0.020	≤1.00	≤2.00	≤0.045	≤0.035	23.0~28.0	19.0~23.0	4.0~5.0	1.0~2.0	≤0.10	

Physical Properties

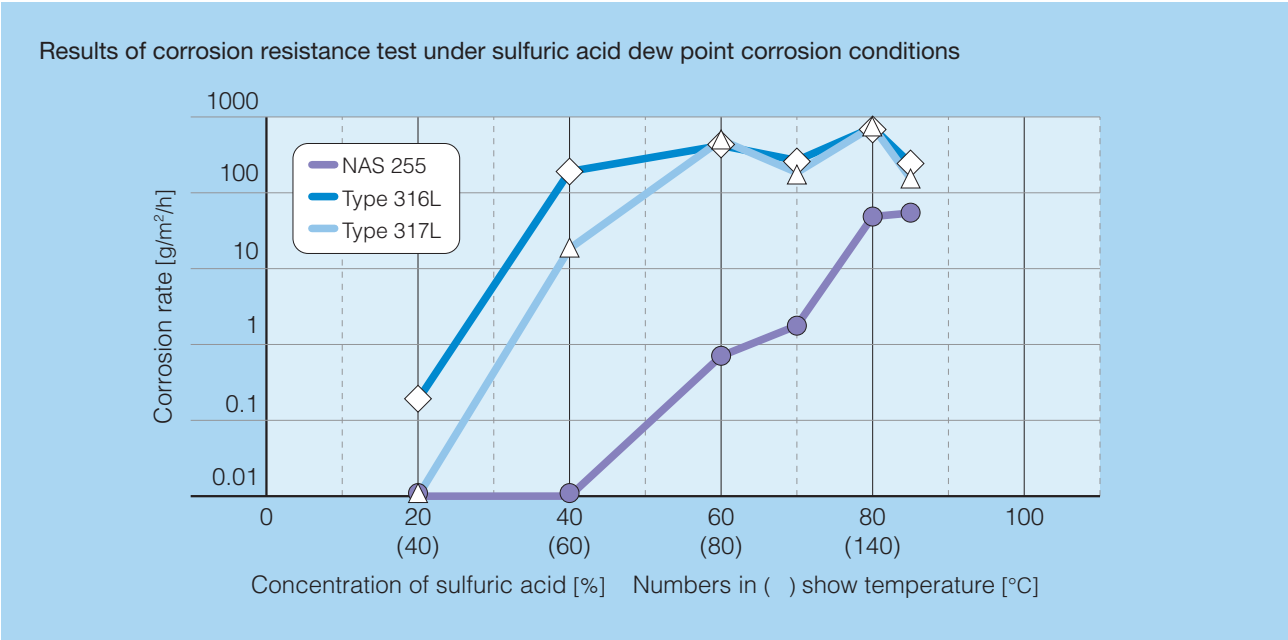
Density	[g/cm ³]	8.05
Specific heat	[J/kg · K]	452
Electrical resistivity	[μΩ · cm]	97
Thermal conductivity	[W/m · K]	12.2
Average coefficient of thermal expansion [10 ⁻⁶ /°C]	20~200°C	14.9
	20~300°C	15.3
	20~400°C	15.7
Young's modulus	[MPa]	19.0 × 10 ⁴
Magnetism		None
Melting range	[°C]	1360~1397



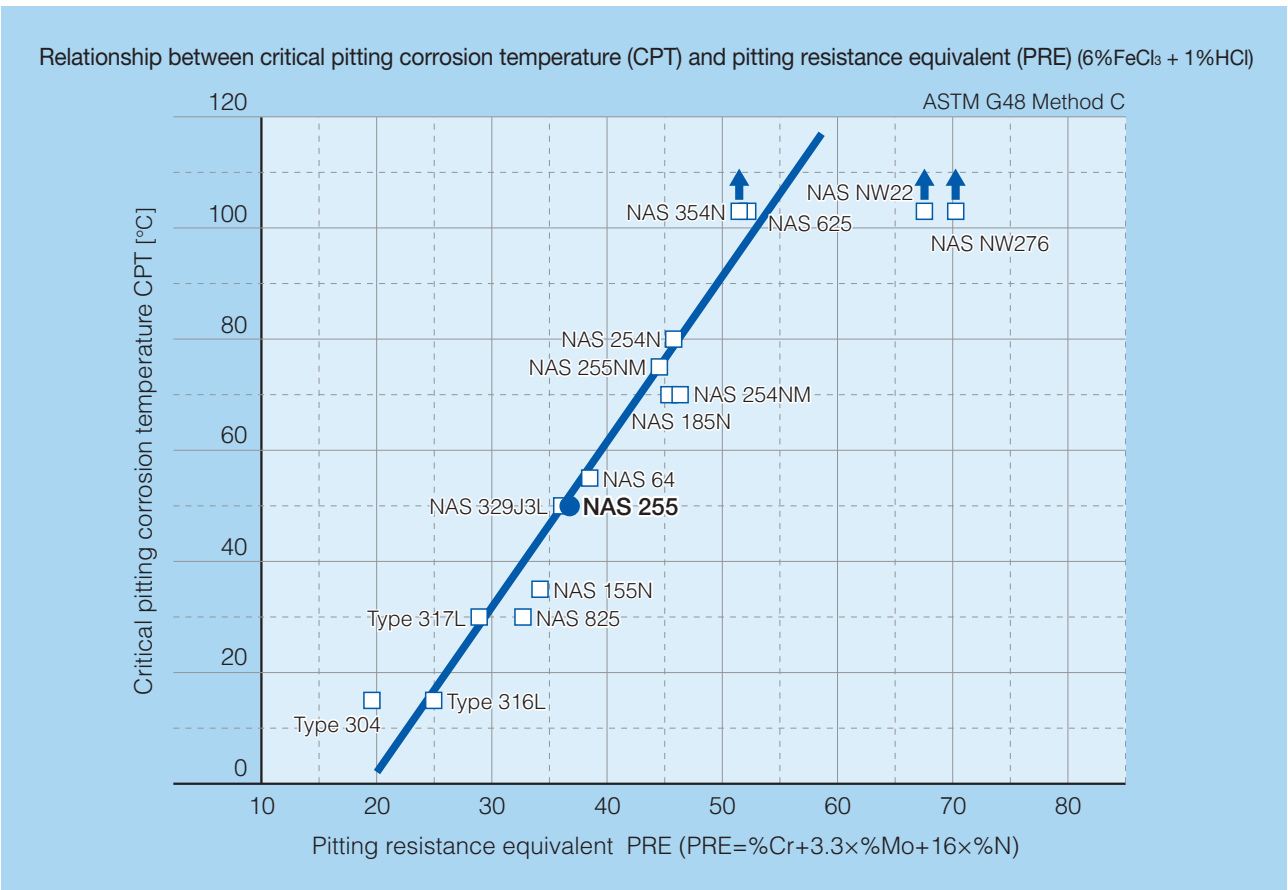
Corrosion Resistance

Acid Resistance

NAS 255 shows superior corrosion resistance against reducing acids such as sulfuric acid and phosphoric acid in comparison with that of Type 316L and Type 317L.



Pitting Corrosion Resistance



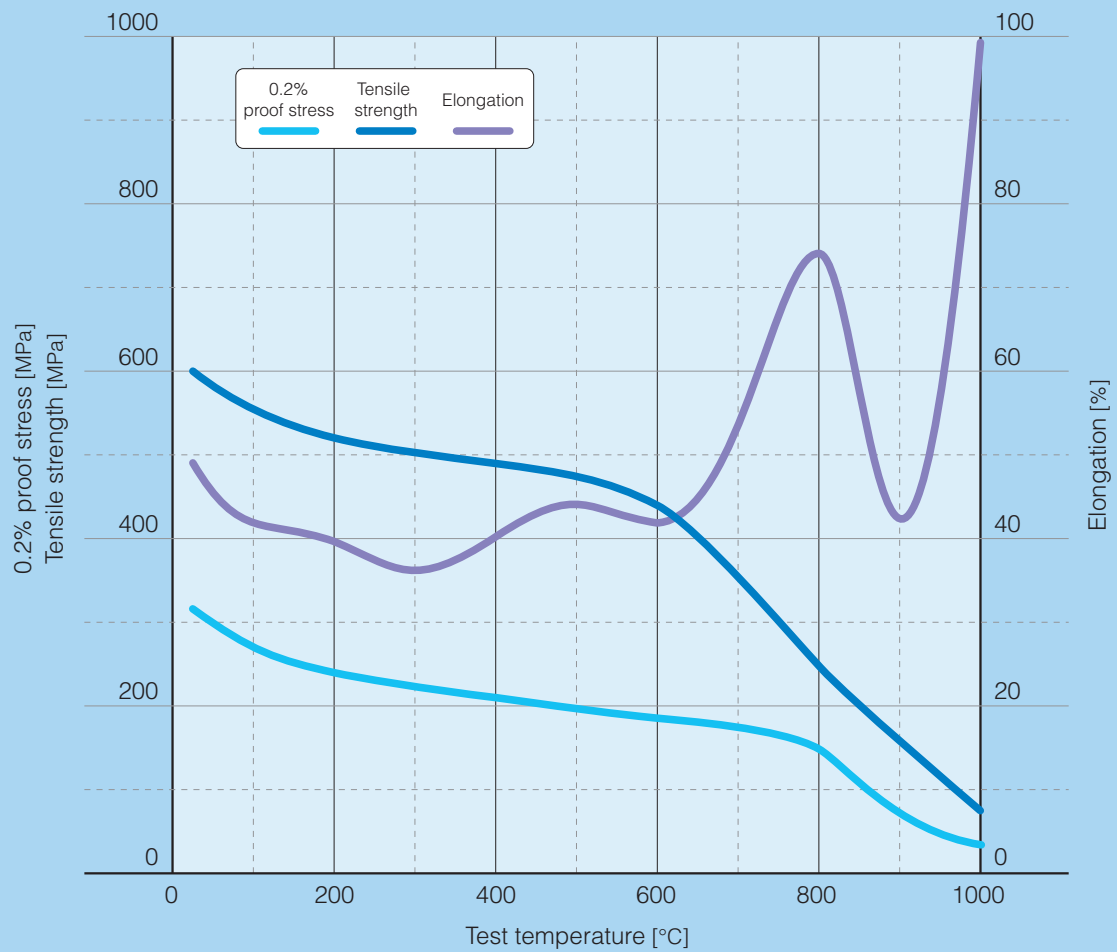
Mechanical Properties

Mechanical Properties at Room Temperature

		0.2% proof stress [MPa]	Tensile strength [MPa]	Elongation [%]	Hardness [HRB]
Specification (SUS 890L)		≥ 215	≥ 490	≥ 35	≤ 90
Specification (UNS N08904)		≥ 220	≥ 490	≥ 35	≤ 90
Example	Plate 12mm ^t	247	593	57	86
	Cold-rolled sheet 2mm ^t	291	632	43	79
	Cold-rolled sheet 0.5mm ^t	302	630	43	80

High Temperature Strength

Results of high temperature tensile test



Workability

Work similar to that with ordinary austenitic stainless steels is possible.

Weldability

Weldability is on the same level as ordinary austenitic stainless steels. Preheating and post-heating are not necessary. As welding electrodes, in applications under severe corrosion environments, use of welding consumables with equal or higher corrosion resistance is recommended. When the corrosion environment is not severe, and when the purpose of welding is for joining, matching welding consumables may be used.

Heat Treatment

Because NAS 255 is an austenitic stainless steel, heat treatment also conforms to that of standard austenitic stainless steels. The solution heat treatment conditions recommended in JIS G4305 are as follows:

Heat treatment condition: 1030~1180°C; Water cooling

Pickling

A mixture of nitric acid and hydrofluoric acid is used in pickling. However, due to the high corrosion resistance of NAS 255, scale is somewhat difficult to remove in comparison with Type 304. Therefore, the material should be immersed in an alkaline solution before pickling, or if possible, shot blasting is extremely effective.

Applications

Sulfuric acid and phosphoric acid plants, seawater heat exchangers, chemical plants, food plants, etc.

For more information, please contact:

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Note regarding the handling of property data:

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