

NAS 75N (UNS S32760)

NAS High Corrosion Resistant Super Duplex Stainless Steel

NAS 75N is a super duplex stainless steel with a pitting resistance equivalent (PRE) number of more than 40, and provides excellent corrosion resistance and strength properties. In comparison with UNS S32205, SUS 329J3L, and SUS 329J4L (NAS 64), it offers superior localized corrosion resistance, and thus is suitable for use in chemical plants, seawater desalination plants, and similar severe environments. Nippon Yakin supplies this product in plate form.

Steel Grade/Standard

NAS	JIS	ASTM A240	EN 10088-2/10028-7
NAS 75N	—	UNS S32760	1.4501

Chemical Composition

	C	Si	Mn	P	S	Ni	Cr	Mo	N	Cu	W	PRE [*]
Specification (UNS S32760)	≤0.030	≤1.00	≤1.00	≤0.030	≤0.010	6.0~8.0	24.0~26.0	3.0~4.0	0.20~0.30	0.50~1.00	0.50~1.00	≥40
Specification* (EN 1.4501)	≤0.030	≤1.00	≤1.00	≤0.035	≤0.015	6.0~8.0	24.0~26.0	3.0~4.0	0.20~0.30	0.50~1.00	0.50~1.00	—

*EN 10088-2

*PRE = %Cr + 3.3×%Mo + 16×%N

Physical Properties

Density	[g/cm ³]	7.80
Specific heat	[J/kg · K]	460
Electrical resistivity	[μΩ · cm]	90.0
Thermal conductivity	[W/m · K]	12.8
Average coefficient of thermal expansion [10 ⁻⁶ /°C]	20~100°C	13.5
	20~200°C	13.8
	20~300°C	13.8
	20~400°C	14.0
Young's modulus	[MPa]	19.0 × 10 ⁴
Magnetism		Y (magnetizable)
Melting range	[°C]	1400~1450



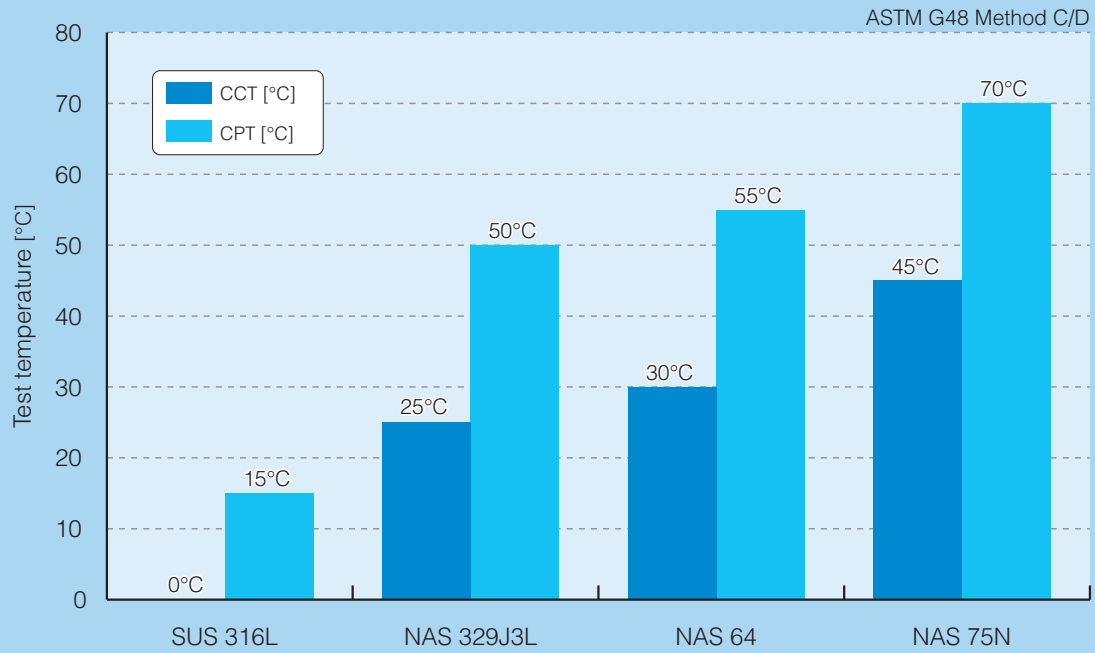
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Corrosion Resistance

NAS 75N has excellent localized corrosion resistance (pitting corrosion, crevice corrosion) and acid resistance in comparison with SUS 304, SUS 316L, NAS 329J3L (UNS S32205), NAS 64.

Pitting Corrosion and Crevice Corrosion Resistance

• Critical pitting corrosion temperature (CPT) and critical crevice corrosion temperature (CCT) (6%FeCl₃ + 1%HCl, 72hr)



Acid Resistance

• Corrosion resistance in various acids (Test time: 24hr)

	Concentration	Temperature	Corrosion rate [mm/y]			
			NAS 75N	NAS 64	NAS 329J3L	SUS 316L
H ₂ SO ₄	10%	boiling	1.45	3.64	3.70	19.70
HCl	1%	boiling	0.01	0.03	5.41	6.94
HNO ₃	60%	boiling	0.06	0.08	0.11	0.17
H ₃ PO ₄	80%	boiling	3.90	4.99	5.52	25.00
CH ₃ COOH	80%	boiling	<0.01	<0.01	<0.01	<0.01

Mechanical Properties

Mechanical Properties at Room Temperature

		0.2% proof stress [N/mm ²]	Tensile strength [N/mm ²]	Elongation [%]	Hardness [HB]	Impact value R.T. Vnotch Fullsize (J)	
Specification (UNS S32760)		≥550	≥750	≥25	≤270	—	—
Specification (EN 1.4501)		≥530	730~930	≥25	—	≥100 (long)	≥60 (tr)
Example	Hot-rolled plate sheet 20mm ^t	583	834	36	243	295	290
	Hot-rolled plate 8mm ^t	616	852	35	243	—	—

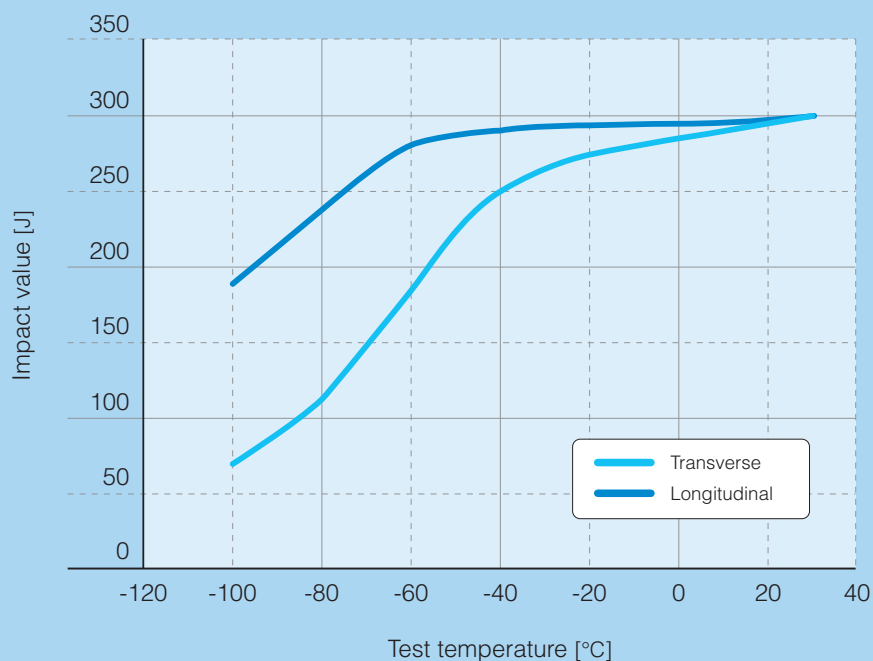
High Temperature Strength

(6mm^t hot-rolled plate)

Temperature [°C]	0.2% proof stress [N/mm ²]	Tensile strength [N/mm ²]	Elongation [%]
100	495	784	30
150	481	752	33
200	464	742	28
250	462	742	25
300	467	760	24
350	453	770	25
400	453	762	28

Impact Value

- Charpy impact test (14mm^t hot-rolled plate, full size)



Formability

Regarding cold formability, care is required as proof stress is high and elongation is low in comparison with SUS 304.

Weldability

In welding, the interpass temperature should be no more than 100°C in order to prevent formation of intermetallic compounds. Preheating is not necessary. Welding consumables for UNS S32760 should be used.

Heat Treatment

After heating to a solution treatment temperature of 1080~1120°C (ASTM standard requires above 1100°C), quenching is necessary. Cooling must be performed as rapidly as possible so as to minimize the duration of the material's exposure to the embrittlement temperature range (475°C embrittlement, σ phase embrittlement).

Pickling

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

Applications

Chemical plant, Chemical tanker, Seawater desalination system, Seawater pump

For more information, please contact:

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Note regarding the handling of property data:

The technical information contained in this product guide is representative values obtained in property tests and other items used to explain the performance of the product. With the exception of items specifically mentioned as provisions of a "Standard," the contents do not represent guaranteed upper limit or lower limit values. This information is also subject to change in the future without notice. To obtain the most recent information, please contact Nippon Yakin.