

NAS 354N UNS N08354

7.5%Mo Super Austenitic Stainless Steel

NAS 354N is a super austenitic stainless steel with excellent corrosion resistance in various environments. The high chromium, molybdenum and nitrogen contents provide high resistance to crevice and pitting corrosion in oxidizing chloride environments while the high nickel content enhances resistance to stress corrosion cracking. The corrosion resistance of NAS354N exceeds the conventional 6 Mo super austenitic stainless steels because of containing 7.5% Mo.

NAS 354N is available in the forms of plate, sheet, strip and pipe.

Chemical Composition

(Typical chemical composition, Unit: wt%)

Element	C	Si	Mn	P	S	Ni	Cr	Mo	N
Spec.	≤0.030	≤1.00	≤1.00	≤0.025	≤0.005	34.00 ~36.00	22.00 ~24.00	7.00 ~8.00	0.17 ~0.24
Ex.	0.010	0.08	0.14	0.016	0.001	34.72	22.76	7.58	0.20

Physical Properties

Density	g/cm ³	8.16
Heat capacity	J/kg·K at 20°C	419
Specific electric resistance	μΩ·cm	102.6
Thermal conductivity	W/m·K at 20°C	9.8
Mean thermal expansion coefficient	10 ⁻⁶ /°C	
	20~200°C	14.13
	20~300°C	14.69
	20~400°C	15.20
Young's modulus	MPa	19.3 × 10 ⁴
Magnetism		None
Melting point	°C	1362 ~ 1391

Mechanical Properties

Shape	Thickness(mm)	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Hardness
Spec.	—	≥295	≥640	≥35	≤230HV ≤96HRB ≤217HB
Coil	2.0	395	794	49	89HRB
Hot Plate	6.0	386	763	57	181HB



Corrosion resistance

NAS354N has excellent pitting and crevice corrosion resistance in environments containing high concentration of chloride ion. This resistance results from the high level of chromium, molybdenum and nitrogen. Because of its high value of PRE (Pitting Resistance Equivalent), Critical Pitting corrosion Temperature (CPT) and Critical Crevice corrosion Temperature (CCT) of NAS354N in the acidified ferric chloride solution of ASTM G48 exceed those of conventional super austenitic stainless steels such as S31254 and N08367. The resistance of NAS354N to stress corrosion cracking resistance in high chloride containing environments is also excellent in comparison with 6Mo stainless steels due to high concentration of Ni. General corrosion resistance of NAS354N to oxidizing acids, several diluted reducing acids and alkaline solutions is also higher than those of the conventional super austenitic stainless steels because of high Ni and Mo.

Corrosion properties of NAS354N in the laboratory corrosion tests are shown in the following tables and figures.

General Corrosion Resistance

Media	Concentration	Temperature	Corrosion Rate (mm/a)			
			Type316L (S31603)	NAS185N (S31254)	NAS354N (N08354)	NASNW276 (N10276)
Sulfuric acid	10%	Boiling	24.6	3.81	1.04	0.14
	20%		179	9.45	7.13	0.32
	40%		3129	41.1	29.2	1.04
Hydrochloric acid	1%	Boiling	8.87	0.18	0.13	0.01
	3%		64.6	40.1	24.9	1.49
Hydrofluoric acid	1%	80°C	14.5	1.83	0.50	0.25
	3%		54.1	6.39	2.27	0.48
Phosphoric acid	40%	Boiling	0.25	0.10	0.05	0.04
	60%		0.56	0.35	0.26	0.07
	80%		25.1	7.50	3.61	0.50
Nitric acid	20%	Boiling	0.02	0.02	0.03	0.67
	40%		0.05	0.07	0.05	4.04
	60%		0.17	0.26	0.14	20.5
Formic acid	40%	Boiling	0.62	0.12	<0.01	0.01
	60%		0.73	0.18	0.10	0.01
	80%		0.49	0.26	0.13	<0.01
Sodium hydroxide	40%	Boiling	—	0.53	0.14	—
	60%		—	2.46	0.37	—

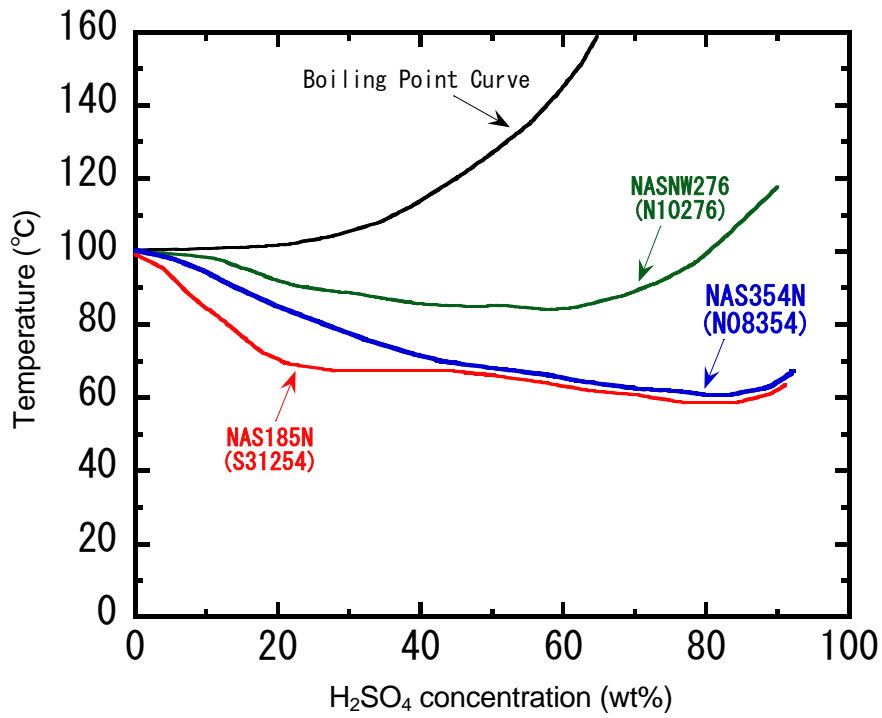


Fig.1 Iso-corrosion diagram for NAS354N in sulfuric acid. (Threshold value is 0.1mm/a)

Pitting Corrosion Resistance

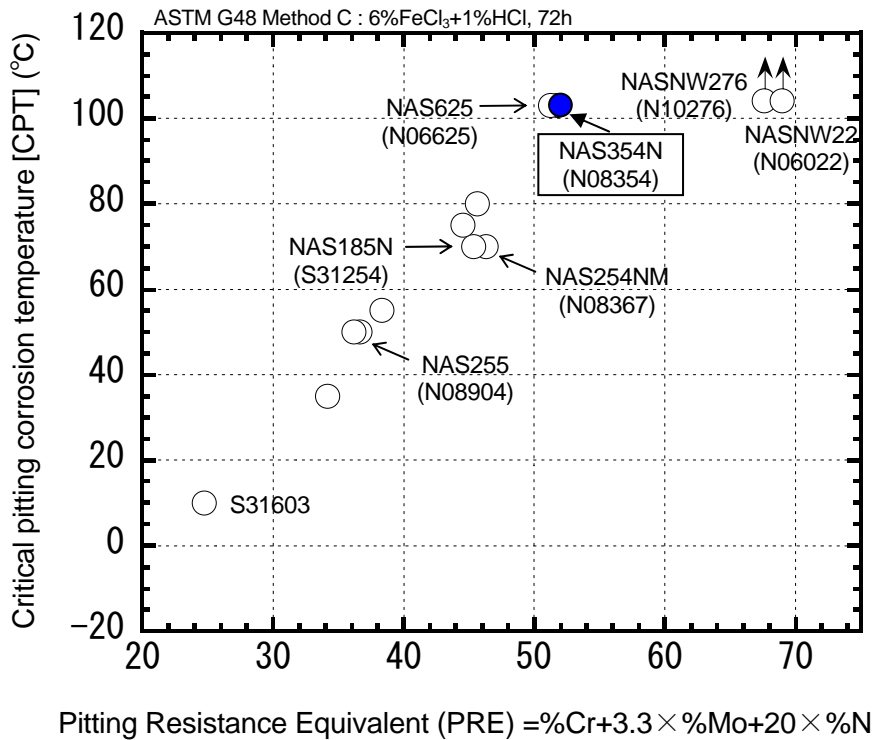


Fig.2 Pitting corrosion resistance of NAS354N in accordance with ASTM G48 Method C.

Crevice Corrosion Resistance

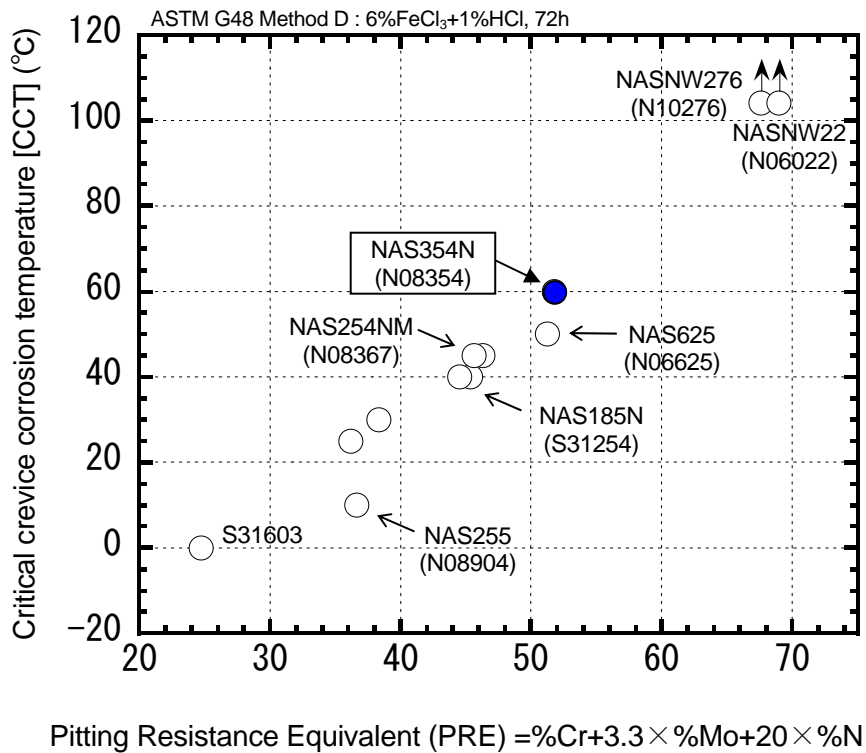


Fig.3 Crevice corrosion resistance of NAS354N in accordance with ASTM G48 Method D.

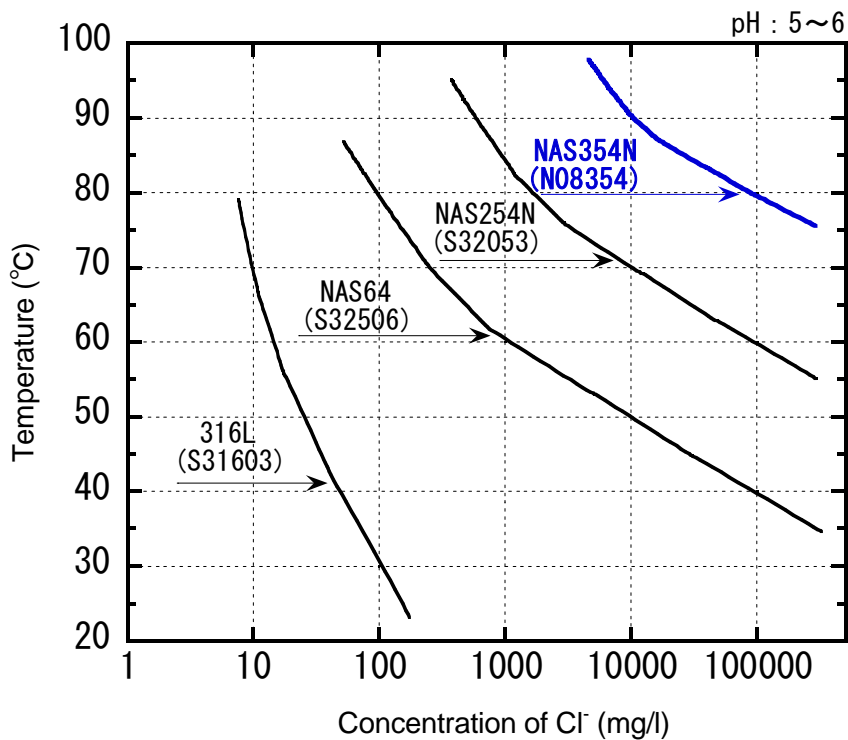


Fig.4 Limit of corrosion resistance for NAS354N in chloride containing environment in accordance with JIS G 0592 (Method of determining the repassivation potential for crevice corrosion of stainless steels).

Stress Corrosion Resistance

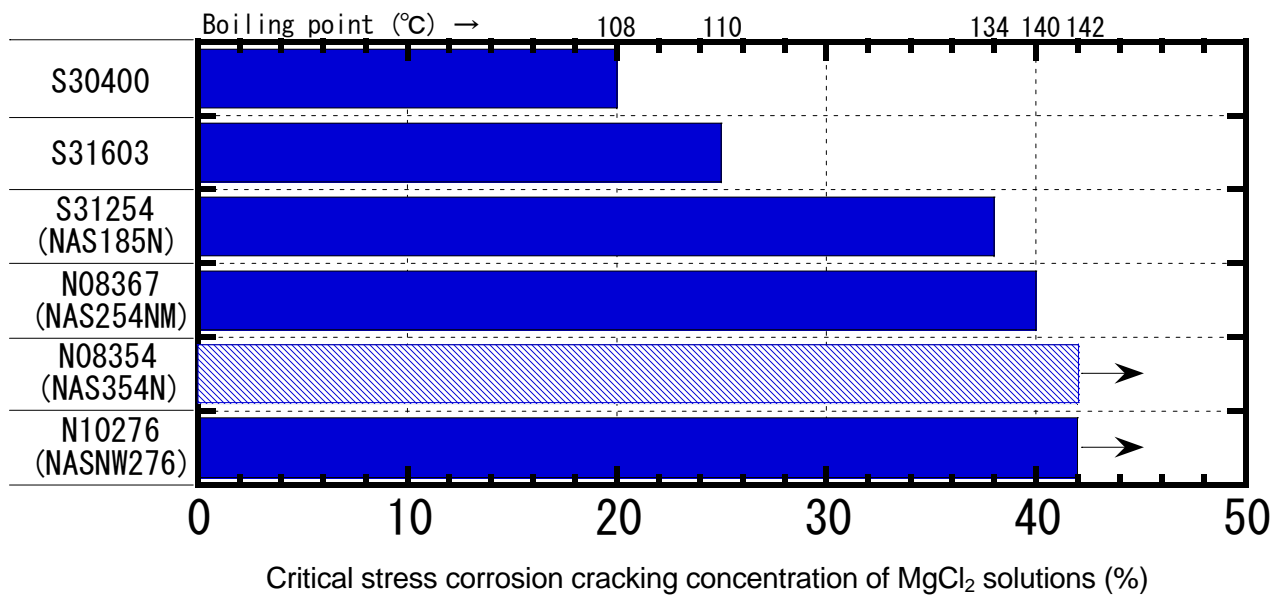


Fig.5 Resistance of NAS354N to stress corrosion cracking in boiled MgCl₂ solutions.

Machinability

Stainless steels with high nickel contents such as NAS354N are generally more difficult to be machined than conventional austenitic grades. However, the machinability of NAS354N is better than that of nickel based alloys. We recommend using sintered carbide cutting tools, slower machining speed, and deeper depth of cut.

Applications

Desalination plants, Flue gas desulfurization equipment, Chemical process tanks and pipelines.

The information and data presented in this brochure are typical or average values and are not a guarantee of maximum or minimum values. Information given in this brochure is subject to alteration without notice. The company's sales and technical departments are at your disposal for more complete information.

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