

NAS H38X (UNS N08120)

NAS Heat-Resistant Nickel Alloy

NAS H38X (UNS N08120) is a high-nickel heat resistant alloy offering outstanding high-temperature strength and oxidation resistance. With coarse grain structure controlled by high temperature heat treatment and C, N, Nb components, NAS H38X offers particularly high creep strength.

Nippon Yakin supplies NAS H38X in plate form.

Grade/Standard

NAS	JIS	ASTM B409
NAS H38X	—	UNS N08120

Chemical Composition

	C	Si	Mn	P	S	Ni	Cr	Mo	Cu
Specification ASTM B409 (UNS N08120)	0.02 ~0.10	≦1.0	≦1.5	≦0.040	≦0.03	35.0 ~39.0	23.0 ~27.0	≦2.50	≦0.50
	Al	Ti	B	Co	W	N	Nb	Fe	
Specification ASTM B409 (UNS N08120)	≦0.40	≦0.20	≦0.010	≦3.0	≦2.50	0.15 ~0.30	0.4 ~0.9	Bal.	

Physical Properties

Density	[g/cm ³]	8.00	
Specific heat	[J/kg · K]	472	
Electrical resistivity	[μΩ · cm]	103	
Thermal conductivity	[W/m · K]	11.5	
Average coefficient of thermal expansion	[10 ⁻⁶ /°C]	25~200°C	14.8
		25~400°C	15.6
		25~600°C	16.2
		25~800°C	17.0
Young's modulus	[MPa]	19.6x10 ⁴	
Magnetism	[μ]	None	
Melting range	[°C]	1,360~1,391	

Mechanical Properties

1. Mechanical Properties at Room Temperature

	0.2% proof stress [MPa]	Tensile strength [MPa]	Elongation [%]	Hardness [HB]
Specification ASTM B409 (UNS N08120)	≥276	≥621	≥30	—
Example Hot-rolled plate 16mmt	318	726	51	176

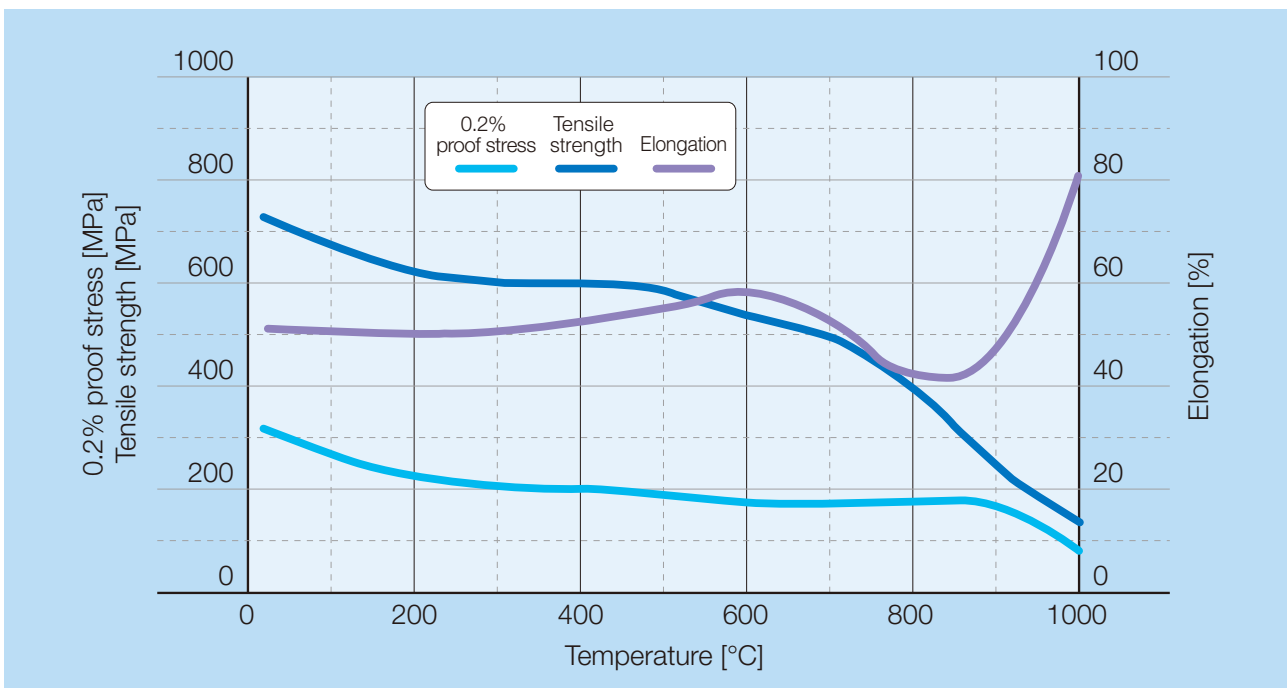
2. Creep Properties

	Test condition	Rupture time [hr]	Elongation [%]
Example Hot-rolled plate 16mmt	816°C, 110MPa	86	65

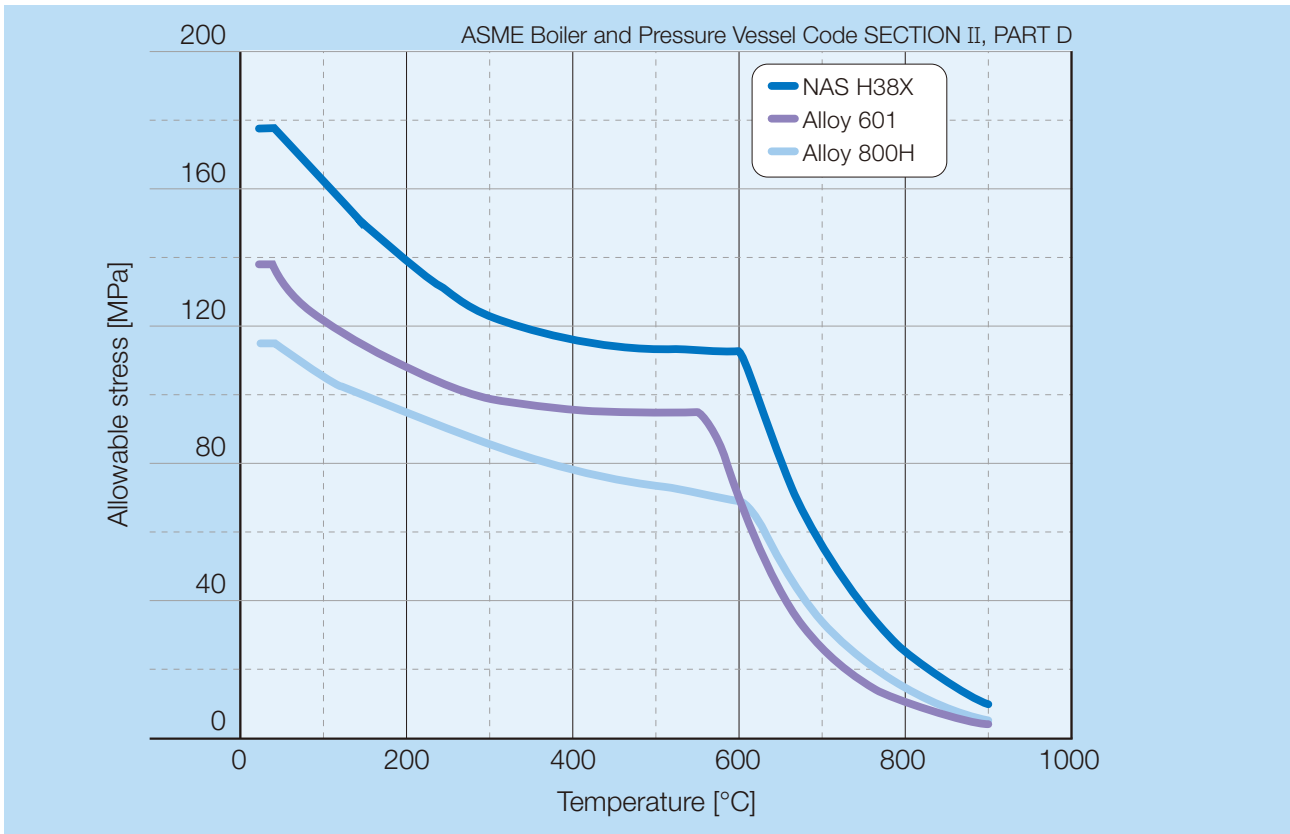
Heat Treatment and Grain Size

	Heat treatment	Crystal grain size
Specification ASTM B409 (UNS N08120)	≥1,177°C	No.5 or coarser

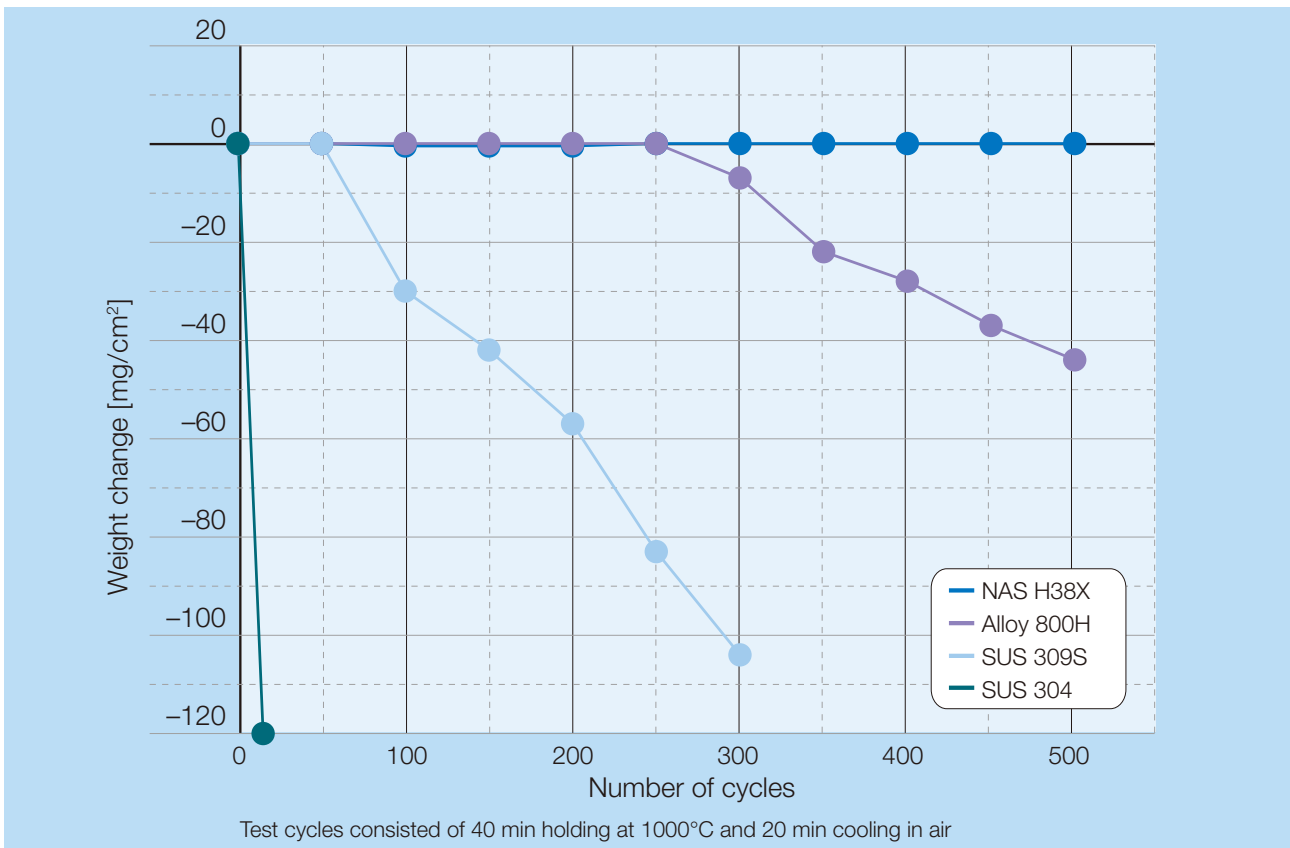
High Temperature Strength



Allowable Stress



Cyclic Oxidation Properties



Workability

Cold workability is equivalent to standard austenitic stainless steel.

Weldability

NAS H38X is weldable by TIG, MIG, and shielded arc welding processes. AWS A5.9 ER3556 welding electrodes are commonly used.

Heat Treatment

NAS H38X exhibits an austenite structure similar to austenitic stainless steel and is heat-treated in the same way. Typical heat treatment is as follows.

- Solution treatment: 1,177~1,232°C, Rapid cooling

Pickling

A mixture of nitric and fluoric acid is used in pickling.

Properties

NAS H38X provides outstanding high-temperature strength, oxidation resistance, and carburization resistance, as well as excellent creep characteristics in temperatures of 800°C and above.

Applications

Heat treatment furnace parts, heat treating fixtures, and other high-temperature environments.

For more information, please contact:

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