



Properties of Screws Made of Special Materials

● Mechanical Properties

Properties	Inconel* (NCF600)	Pure Molybdenum		Hastelloy* C-276 (NW0276)	Hastelloy* C-22 (NW6022)	Monel 400 equiv. (UNS N0400)	Nickel (NW2201)	Super Invar	Phosphor Bronze (C5191)	Aluminum Alloy (A5056)
	SNSI	SNSM	SNFCM	SNSH-C276	SNSH-C22	SNSMN	SNSN	SNSIV	SNSP	SNSA
Tensile Strength (N/mm ²)	548 - 695	515		793	786	517 - 620	343 - 411	470	590 or Higher	294
0.2% Proof Stress (N/mm ²)	205 - 352	380		400	365	172 - 345	68 - 166	333	—	245
Elongation (%)	35 - 55	15		60	57	35 - 60	40 - 60	43	8	12
Hardness	65 - 85 (HRB)	—		—	92 (HRB)	60 - 80 (HRB)	75 - 100 (HB)	143 (HV)	—	98 (HB)

● Values in chart are for reference only. They are not guaranteed values.

● Physical Properties

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	SNSI	SNSM	SNFCM	SNSH-C276	SNSH-C22	SNSMN	SNSN	SNSIV	SNSP	SNSA
Specific Gravity	8.42	10.2		8.89	8.61	8.80	8.89	8.15	8.83	2.64
Longitudinal Elastic Modulus (GPa)	207	327		205	209	179	206	132	105	71.7
Thermal Conductivity (W/(m·K))	16.7	142		—	—	22	79.5	10.47	67	112
Linear Expansion Coefficient (K ⁻¹)	13.4×10 ⁻⁶	5.1×10 ⁻⁶		11.2×10 ⁻⁶	12.4×10 ⁻⁶	14.2×10 ⁻⁶ (100°C)	13.4×10 ⁻⁶	0.69×10 ⁻⁶	18×10 ⁻⁶	24.1×10 ⁻⁶
Electric Resistance (μΩ·m)	1.0	0.058		1.3	1.2	0.5	0.085	0.77	0.13	0.064

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● Chemical Resistance of Inconel*, Hastelloy*, and Nickel Screws

Chemical Name	Temperature	Inconel*	Hastelloy*	Nickel
Dilute Sulfuric Acid	Room Temperature	A	AA	A
	Boiling Point	D	A	D
Concentrate Sulfuric Acid	Room Temperature	C	AA	C
	Boiling Point	D	D	D
Dilute Hydrochloric Acid	Room Temperature	B	AA	A
	Boiling Point	D	D	D
Concentrate Hydrochloric Acid	Room Temperature	D	AA	D
	Boiling Point	D	B	D
Dilute Nitric Acid	Room Temperature	D	AA	D
	Boiling Point	—	AA	D
Concentrate Nitric Acid	Room Temperature	A	AA	D
	Boiling Point	—	D	D
Dilute Phosphoric Acid	Room Temperature	AA	AA	AA
	Boiling Point	—	AA	D
Concentrate Phosphoric Acid	Room Temperature	AA	AA	AA
	Boiling Point	—	B	D
Sodium Hydroxide (Diluted)	Room Temperature	AA	—	AA
	Boiling Point	C	—	AA
Sodium Hydroxide (Diluted)	Room Temperature	AA	—	AA
	Boiling Point	C	—	AA

AA : Highly Excellent

C : Limit

A : Very Good

D : Not satisfactory

B : Satisfactory

*Inconel is a registered trademark of Special Metals Corporation.

Hastelloy is a registered trademark of Haynes International, Inc.

● Chemical Resistance of Ceramic Screws

Chemical Name	Temperature	Hour	Effect
35% Hydrochloric Acid	Boiling	30 minutes	☉
70% Nitric Acid	Boiling	30 minutes	☉
98% Sulfuric Acid	Boiling	30 minutes	☉
90% Phosphoric Acid	Boiling	30 minutes	○
60% Hydrofluoric Acid	20°C	24 hours	△
10% Potassium Hydroxide	80°C	7 Days	☉
Potassium Hydroxide	500°C(Boiling)	24 hours	△
Sodium Hydroxide	500°C(Boiling)	24 hours	○
Sodium Carbonate	900°C(Boiling)	24 hours	○
Sodium Sulfate	1000°C(Boiling)	24 hours	☉
Potassium Fluoride	90°C(Boiling)	4 hours	×

☉ : No Corrosion △ : Moderate Corrosion

○ : Slight Corrosion × : Heavy Corrosion

⚠ Important Information about Chemical Resistance Data

- A test piece was used to acquire the test data. Chemical resistance changes with performance conditions. Always carry out tests under performance conditions similar to actual conditions in advance.

● Magnetic Flux Density of Phosphor Bronze Screws

	Phosphor Bronze	SUSXM7(S.S. grade: A2)
Magnetic Flux Density (T)	0	5×10 ⁻⁵

Measuring device : 5080 Gauss (Tesla) Meter by F.W.BELL

Measuring conditions : DC magnetic field measuring mode

Probe and sample separation distance: 5 mm