



Technical Data Sheet

GENERAL

ATI K-500™ Alloy (UNS N05500) is an age-hardenable nickel-copper alloy characterized by the good general corrosion resistance of ATI 400 Alloy with the added advantage of increased strength and hardness. The alloy maintains good strength up to 1,200°F (648°C) and is strong and ductile to temperatures as low as -423°F (-217°C). As with ATI 400 Alloy, the alloy has excellent resistance to flowing brines, brackish water, and seawater. The alloy also has low magnetic permeability to -210°F (-99°C).

This alloy is commonly used in the oil and gas, and the marine industries. Applications for ATI K-500 alloy include pumps and drive shafts, impellers, valve components, springs, fasteners, oil well packers, and subsurface safety valves. Standard mill forms for ATI K-500 alloy include bar, shapes, and forgings.

SPECIFICATIONS

- QQ-N-286, Rod and Bar
- BS 3076-NA-18, Bar

Physical Properties				
	Temp, °F	British Units	Temp, °C	Metric Units
Density	70	0.306 lb/in ³	21	8.47 g/cc
Modulus of Elasticity	70	26.0 x 10 ⁶ psi	21	179 GPa
Electrical Resistivity	70	24.1 microhm-in	21	0.61 microhm-m
	200	24.4 microhm-in	93	0.62 microhm-m
	400	24.8 microhm-in	204	0.63 microhm-m
	600	25.2 microhm-in	316	0.64 microhm-m
	800	25.6 microhm-in	427	0.65 microhm-m
Mean Coefficient of Thermal Expansion	70-200	7.6 microinches/in-°F	21-93	13.7 microns/m-°K
	70-400	8.1 microinches/in-°F	21-204	14.6 microns/m-°K
	70-600	8.3 microinches/in-°F	21-316	14.9 microns/m-°K
	70-800	8.5 microinches/in-°F	21-427	15.3 microns/m-°K
Thermal Conductivity	70	121 Btu-in/ft ² -hr-°F	21	17.4 W/m-°K
	200	136 Btu-in/ft ² -hr-°F	93	19.6 W/m-°K
	400	136 Btu-in/ft ² -hr-°F	204	22.5 W/m-°K
	600	136 Btu-in/ft ² -hr-°F	316	25.7 W/m-°K
	800	136 Btu-in/ft ² -hr-°F	427	28.6 W/m-°K
Specific Heat	70	0.096 Btu/lb-°F	21	408 J/Kg-°K
Magnetic Permeability	70	1.002 (H=200 oersteds)	21	1.002 (H=16 KA/m)

Corrosion Resistance								
H ₂ SO ₄	HCl	H ₃ PO ₄	HNO ₃	Organic Acids	Alkalies	Salts	Seawater	Chloride Cracking
G	G	E	NR	G	G	G	G	A

KEY: E - Excellent G - Good A - Acceptable NR - Not Recommended



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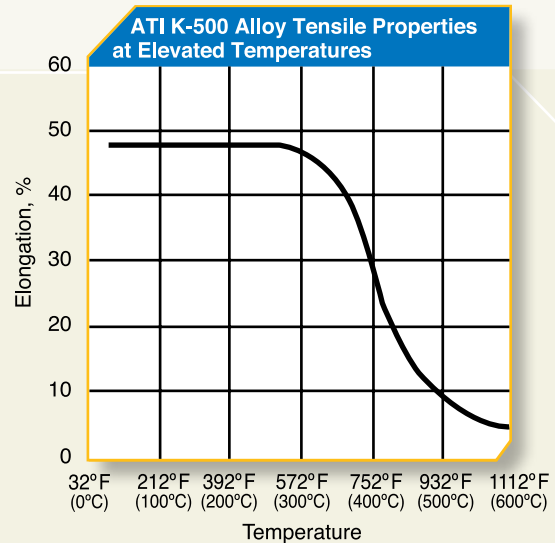
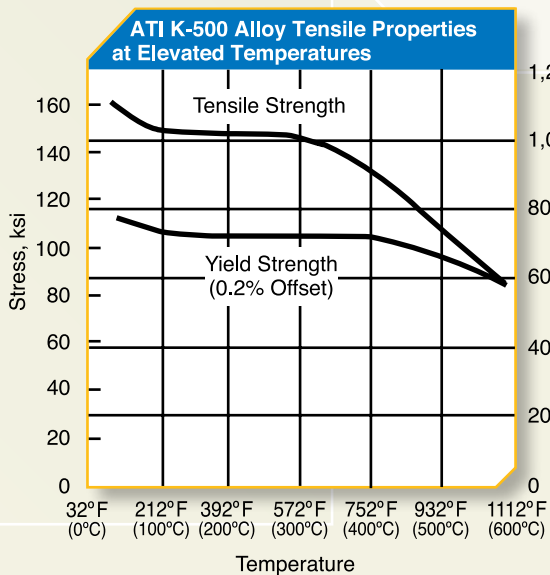
Chemical Composition

	Ni	Fe	Ti	Al	Mn	C	Cu
wt %, nominal	66.0	1.00	0.60	2.7	0.70	0.10	Bal

Mechanical Properties and Machinability

Metallurgical Condition	Tensile Strength psi (MPa)	Yield Strength 0.2% Offset psi (MPa)	Elongation %	Hardness	Speed Sfpm (Smpm)	Feed lpr (mmpr)	Tool Material
Hot Finished	100 (690)	45 (310)	47	85 Rb	200 (61.0)	0.020 (0.506)	C-6
Hot Finished Age Hardened	150 (1,040)	115 (795)	30	33 Rc	100 (30.5)	0.015 (0.381)	C-2
Cold Drawn	125 (860)	100 (690)	18	95 Rb	180 (54.9)	0.20 (0.508)	C-6
Cold Drawn Age Hardened	170 (1,175)	145 (1,000)	22	38 Rc	60 (18.3)	0.010 (0.254)	C-2
Annealed	90 (620)	40 (275)	42	88 Rb	225 (68.6)	0.020 (0.508)	C-6
Annealed & Age Hardened	145 (1,000)	95 (665)	22	27 Rc	80 (24.4)	0.010 (0.254)	C-2

* Room Temperature Values



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