INCONEL ALLOY 625:

A nickel-chromium-molybdenum alloy with an addition of niobium that acts with the molybdenum to stiffen the alloy's matrix and thereby provide high strength without a strengthening heat treatment. The alloy resists a wide range of severely corrosive environments and is especially resistant to pitting and crevice corrosion. The properties of INCONEL alloy 625 that make it an excellent choice for sea-water applications are freedom from local attack (pitting and crevice corrosion), high corrosion-fatigue strength, high tensile strength, and resistance to chloride-ion stress-corrosion cracking. It is used as wire rope for mooring cables , propeller blades for motor patrol gunboats, submarine auxiliary propulsion motors, submarine quick disconnect fittings, exhaust ducts for Navy utility boats, sheathing for undersea communication cables, submarine transducer controls, and steam-line bellows. Potential applications are springs, seals, bellows for submerged controls, electrical cable connectors, fasteners, flexure devices, and oceanographic instrument components.

High tensile, creep, and rupture strength; outstanding fatigue and thermal-fatigue strength; oxidation resistance; and excellent weldability and brazeability are the properties of INCONEL alloy 625 that make it interesting to the aerospace field. It is being used in such applications as aircraft ducting systems, engine exhaust systems, thrust-reverser systems, resistancewelded honeycomb structures for housing engine controls, fuel and hydraulic line tubing, spray bars, bellows, turbine shroud rings, and heat-exchanger tubing in environmental control systems. It is also suitable for combustion system transition liners, turbine seals, compressor vanes, and thrust-chamber tubing for rocket.

CHEMICAL PROPERTIES(Limiting Chemical Composition%)

Ni	C	Mn	Fe	S	Si	Cr	P	Nb+ Ta	Ti	Mo	Co	Al
58.0 min.	0.10 max.	0.50 max.	5.0 max.	0.015 max.	0.50 max	20.0-23.0	0.015 max	3.15-4.15	0.40 max.	8.0-10.0	1.0 max.	0.40 max

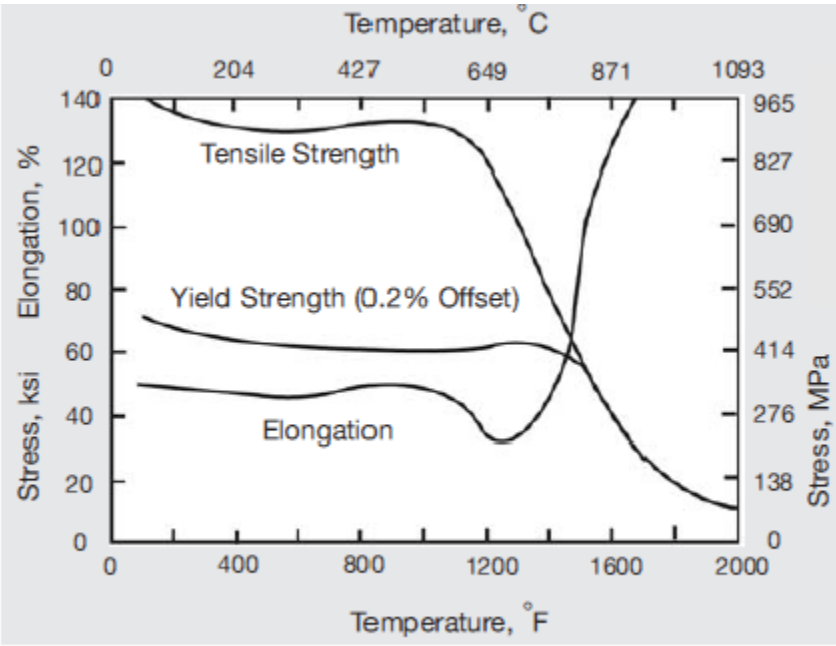
PHYSICAL PRPERTIES

`Density		Melting Range		Specific Heat Capacity		Curie Temperature,		Permeability at 200 Oersted (15.9 kA/m)
g/cm³	lb/in³	°F	°C	@Temperature 21.0 °C	@Temperature 70.0 °F	°F	°C	1.0006
8.44	0.305	2350-2460	1290-1350	410Btu/lb°F	0.098 J/kg°C	<-320	-196	

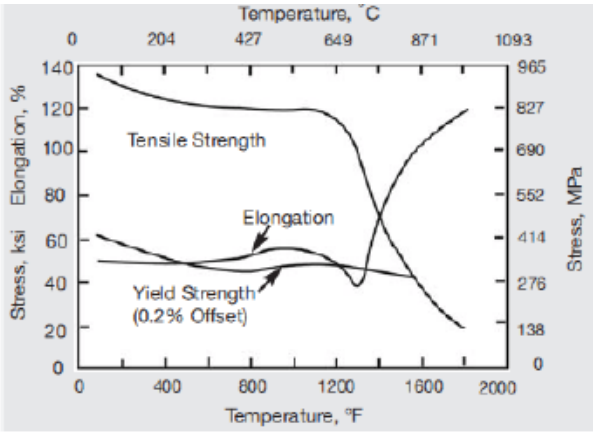
MECHANICAL PROPERTIES

Form And Condition	Tensile Strength		Yield Strength (0.2% Offset)		Elongation	Reduction Of Area	Hardness, Brinell
	ksi	MPa	ksi	MPa	%	%	
ROD, BAR, PLATE							
As-Rolled	120-160	827-1103	60-110	414-758	60-30	60-40	175-240
Annealed	120-150	827-1034	60-95	414-655	60-30	60-40	145-220
Solution-Treated	105-130	724-896	42-60	290-414	65-40	90-60	116-194
SHEET and STRIP							
Annealed	120-150	827-1034	60-90	414-621	55-30	-	145-240
TUBE and PIPE, COLD-DRAWN							
Annealed	120-140	827-965	60-75	414-517	55-30	-	-
Solution-Treated	100-120	689-827	40-60	276-414	60-40	-	-

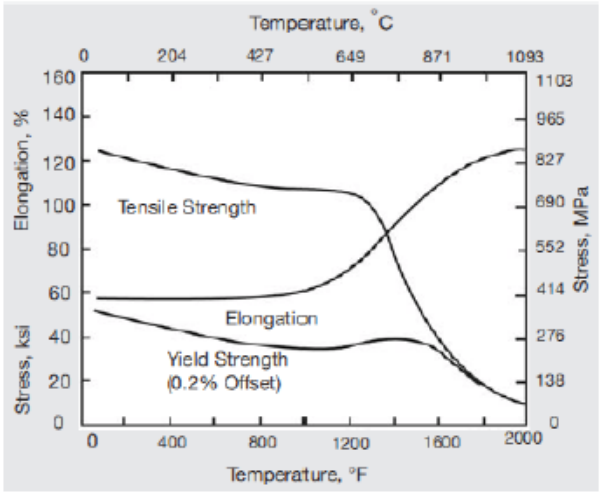
MECHANICAL PROPERTES DIAGRAM



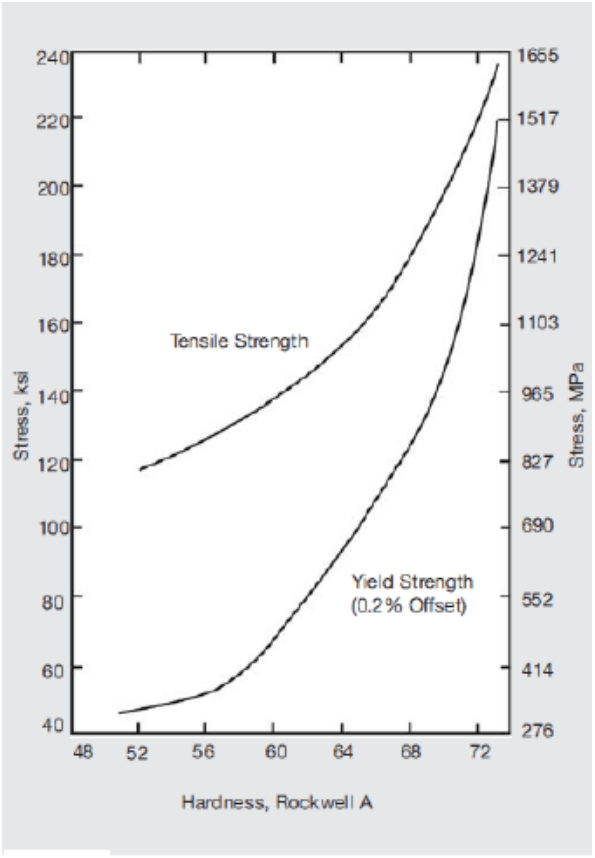
High-temperature tensile properties of annealed bar.



High-temperature tensile properties of cold-rolled annealed sheet.



High-temperature tensile properties of hot-rolled solution-treated rod.



Approximate relationships between hardness and tensile properties of strip.