

NICKEL ALLOY

ALLOY 400

(UNS N04400)

Application

Alloy 400 (UNS N04400) is a solid-solution alloy that can be hardened only by cold working. It has high strength and toughness over a wide temperature range and excellent resistance to many corrosive environments.

Alloy 400 is widely used in many fields, especially marine and chemical processing. Typical applications are valves and pumps; pump and propeller shafts; marine fixtures and fasteners; electrical and electronic components; springs; chemical processing equipment; gasoline and fresh water tanks; crude petroleum stills, process vessels and piping; boiler feedwater heaters and other heat exchangers; and deaerating heaters.

Available tube product forms

STRAIGHT || **COILED** || **SEAMLESS**

Typical manufacturing specifications

ASTM B163, ASTM B165

Also individual customer specifications.

Industries predominantly using this grade

Heat Exchangers, Steam generators, Reboiler tubes

Nuclear core cooling tubes, Control lines ect.

Maximum Coil Length per Dimension (Unit : meter)

		Wall thickness (mm)					
		0.51	0.71	0.89	1.24	1.65	2.11
Outside diameter (mm)	3.175	1321	1026	883	-	-	-
	6.35	603	448	369	283	-	-
	9.53	390	287	233	175	138	115
	12.7	-	211	171	126	98	80
	19.05	-	-	111	81	63	50
	25.4	-	-	-	60	46	37

can provide longer length according to customer requirement

Technical Data

Chemical composition(% by weight)

Element	Ni	Cu	Fe	Mn	C	Si	S	-	-	-	-	-
Minimum	63.0	28.0	-	-	-	-	-	-	-	-	-	-
Maximum	-	34.0	2.5	2.0	0.3	0.5	0.024	-	-	-	-	-

Mechanical Properties

	Tubing, Annealed		Tubing, Stress-Relieved	
		ksi (min.)		ksi (min.)
Tensile Rm	70		85	
Tensile Rm	480	MPa (min.)	585	MPa (min.)
Yield (R.p. 0.2%)	28	ksi (min.)	55	ksi (min.)
Yield (R.p. 0.2%)	195	MPa (min.)	380	MPa (min.)
Elongation	35	% (min.)	15	% (min.)

Physical Properties(Room Temperature)

Specific Heat (0-100°C)	427	J.kg ⁻¹ .°K ⁻¹
Thermal Conductivity	21.8	W.m ⁻¹ .°K ⁻¹
Thermal Expansion	13.9	mm/m.°C
Modulus Elasticity	173	GPa
Electrical Resistivity	5.47	μohm.cm
Density	8.83	g/cm ³

Microstructure



Maximum allowable pressure (Unit : BAR)

		Wall thickness (mm)						
		0.89	1.24	1.65	2.11	2.77	3.96	4.78
Outside diameter (mm)	6.35	322	469	642	830			
	9.53	207	297	409	539	723		
	12.7	153	217	296	390	530		
	19.05		141	191	249	336		
	25.4		105	141	183	245	363	450
	31.8			111	144	192	283	349
	38.1			92	119	159	232	285
	50.8			69	89	117	171	209

* We follow customer requested dimensions.

* Select tubes according to design pressure