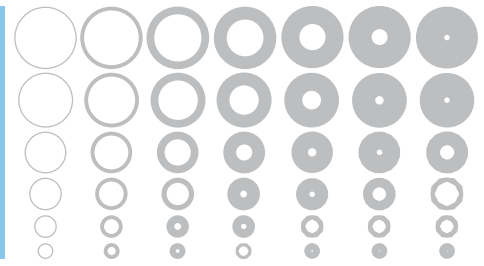
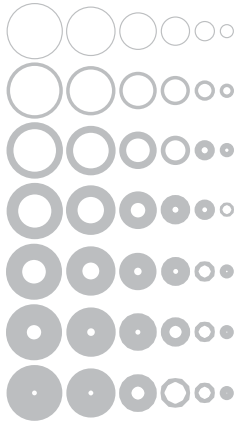


# SuperiorTube COMPANY, INC

Shaping tomorrow...performing today.



## ALLOY 625 Data Memorandum No. 34



### Introduction

Alloy 625, a nickel-chromium-iron alloy with niobium (columbium) and molybdenum added, is a high strength, corrosion- and heat-resistant material. It has excellent resistance to oxidation as evidenced by cyclic oxidation tests that showed total oxide penetrations of only 0.0019 in after 1,000 hr at 1,800°F and 0.0030 in after 600 hr at 2,000°F. With the niobium (columbium) and molybdenum additions it has excellent stress rupture properties to 1,200°F and is not affected by radiation embrittlement. The higher hot strength of Alloy 625 results from the solid solution strengthening of the nickel-chromium matrix by the addition of the niobium (columbium) and molybdenum.

### Super Alloy

Alloy 625 meets Superior Tube's definition of a Super Alloy: "Super Alloys are metals which have 1,000 hr stress rupture strength at 1,200°F at 25,000 psi minimum stress in combination with resistance to progressive scaling (oxidation) and other types of corrosion."

For comparison with other high temperature strength and oxidation resistant materials in the Super Alloy family, request a copy of Bulletin No. 72.

### Chemical Composition

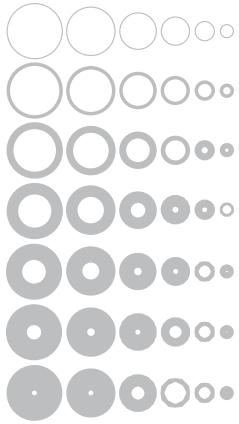
Carbon	0.10% max	Cobalt	1.00% max
Manganese	0.50% max	Molybdenum	8.00/10.00%
Silicon	0.50% max	Iron	5.00% max
Phosphorus	0.015% max	Aluminum	0.40% max
Sulfur	0.015% max	Titanium	0.40% max
Chromium	20.00/23.00%	Nickel	Balance
Niobium (Columbium)	3.15/4.15%		
+ Tantalum			

### Physical Properties\*

Density.....	0.305 lb/in <sup>3</sup>
Electrical Resistivity.....	126.0 microhm-cm
Specific Heat.....	0.098 BTU/lb/°F
Modulus of Elasticity.....	29.8 x 10 <sup>6</sup> psi
Coefficient of Thermal Expansion	
	7.1 in/in/°F x 10 <sup>-6</sup> @ 70-200°F
	9.0 in/in/°F x 10 <sup>-6</sup> @ 70-1700°F

\* @ 70°F except where otherwise noted

# ALLOY 625



## Mechanical Properties

Temper	Ultimate Tensile Strength x 10 <sup>3</sup> psi	Yield Strength 0.2% offset x 10 <sup>3</sup> psi	% Elongation In 2"	Rockwell Hardness
#1	150 max.	60/90	35 min.	C 25 max.
#2	165/195	125/175	10/22	C 28/40
#3	195/235	175/220	3 min.	C 30/45

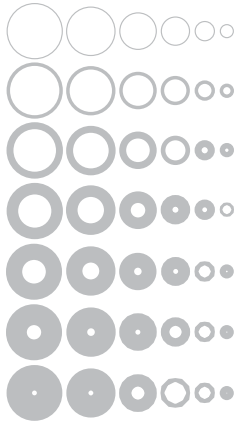
*Applicable to sizes 0.125 in (3.18 mm) OD and larger x 0.015 in (0.38 mm) wall and heavier. Tested at room temperature.*

## Size Range

Alloy 625 is offered in the Seamless and WELDRAWN® forms in the size limits specified below:

SEAMLESS					
Outside Diameter		Wall Capacity			
		Minimum		Maximum	
in	mm	in	mm	in	mm
0.0120	0.305	0.00125	0.032	0.004	0.102
0.0315	0.800	0.00125	0.032	0.010	0.254
0.0625	1.588	0.0015	0.038	0.028	0.711
0.0937	2.380	0.0015	0.038	0.042	1.067
0.1250	3.175	0.0020	0.051	0.049	1.245
0.1875	4.763	0.0025	0.064	0.065	1.651
0.2500	6.350	0.0030	0.076	0.078	1.981
0.3125	7.938	0.0035	0.089	0.083	2.108
0.3750	9.525	0.0035	0.089	0.125	3.175
0.4375	11.113	0.0040	0.102	0.125	3.175
0.5000	12.700	0.0040	0.102	0.125	3.175
0.5625	14.288	0.0045	0.114	0.125	3.175
0.6250	15.875	0.0045	0.114	0.125	3.175
0.7500	19.050	0.0050	0.127	0.035	0.889
0.8750	22.225	0.0050	0.127	0.035	0.889
1.0000	25.400	0.0060	0.152	0.035	0.889
1.1250	28.575	0.0060	0.152	0.035	0.889

# ALLOY 625



WELDRAWN®					
Outside Diameter		Wall Capacity			
		Minimum		Maximum	
in	mm	in	mm	in	mm
0.0625	1.588	0.004	0.102	0.015	0.381
0.0937	2.380	0.004	0.102	0.020	0.508
0.1230	3.124	0.004	0.102	0.028	0.711
0.1875	4.763	0.005	0.127	0.035	0.889
0.2500	6.350	0.005	0.127	0.035	0.889
0.3125	7.938	0.005	0.127	0.035	0.889
0.3750	9.525	0.005	0.127	0.042	1.067
0.4375	11.113	0.007	0.178	0.042	1.067
0.5000	12.700	0.010	0.254	0.049	1.245
0.5625	14.288	0.010	0.254	0.049	1.245
0.6250	15.875	0.010	0.254	0.035	0.889

## Tolerances

Round tubing is produced to the commercial tolerances applicable to two dimensions only. For complete tolerance data, request Data Memo No. 8.

## Applications

The outstanding characteristics of Alloy 625 have proven quite valuable in numerous aerospace applications, including fuel element cladding, fuel nozzles, afterburners, and spray bars. Wide acceptance is also expected in the chemical and marine fields.

## Availability

For prompt handling, inquiries and orders should include details of quantity, dimensions with complete tolerances, lengths, temper, and surface finish desired. Contact Superior Tube or one of our Service Centers in your area with your specific needs.

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