

302

Melt Practice

We offer this high quality austenitic stainless steel for spring applications. To keep costs at a minimum this alloy is supplied from an electric-arc air melted process. Localized variations in chemistry can cause slight changes in ultimate tensile strength when drawing to fine wire.

Typical Chemistry		
	FWM Avg. Wt. %	ASTM A313-95
Carbon	.10	.12
Manganese	1.11	2.00
Silicon	.52	1.00
Phosphorus	.023	.045
Sulphur	.002	.030
Chromium	18.60	17.0-19.0
Nickel	8.40	8.00-9.50
Molybdenum	.32	-
Copper	.36	-
Nitrogen	.03	.10
Iron	Balance	Balance
Cobalt	.16	-

FWM chemistry is for reference only, and is not to be used for specification purposes.

Physical Properties

Density	0.285 lbs/in ³
Modulus of Elasticity	28.0 psi x 10 ⁶
Electrical Resistivity	720 μohms-mm
Thermal Conductivity	16.3 W/m K (100°C)

Thermal Treatment

In wire form, cold worked 302 will gain tensile strength when stress relieved at 350-427°C for 4-6 hours. A reducing atmosphere is preferred, but inert gas can be used. 302 will fully anneal at 1010-1121°C in just a few minutes. There is a carbide precipitation phenomenon that occurs between 427 and 899°C that reduces the corrosion resistance of the alloy. American Society for Testing Materials (ASTM) has described a test method to ensure the alloy has not been damaged.

Applications

302 alloy is the same as 304 alloy except for the .12% carbon maximum. In 304 the maximum carbon is .08%. Technically, all 304 alloy meets the requirements of 302 alloy, but not all 302 can meet 304 chemistry. Practically, this means in general 302 is harder than 304 with the same amount of cold work. End uses for 302 include: stylets, catheters, guide wires, springs and needles.

Mechanical Properties			
% CW	Y.S. (psi)	U.T.S. (psi)	% Elongation (10" gage length)
0%	49,000	106,000	48%
20%	125,000	147,000	9.8%
37%	169,000	189,000	3.2%
50%	196,000	220,000	2.6%
60%	222,000	244,000	2.2%
68%	243,000	273,000	2.1%
75%	251,000	289,000	2.4%
80%	282,000	309,000	2.2%
84%	295,000	327,000	2.2%
87%	300,000	332,000	2.3%
90%	319,000	345,000	2.2%
92%	322,000	371,000	2.5%

Values are typical and may not represent all diameters. Test method will affect results.

Surface Conditions

Stainless steels develop a highly polished appearance as they are drawn to fine diameters. Surface roughness can be less than 5 RMS when processed using SCND* dies and measured with a profilometer. Diameters over .040" will not have as smooth a finish because of polycrystalline dies. Diameters over .100" have an even rougher surface because they are drawn with carbide dies. Additional finish treatments can enhance the surface of the wire.

* SCND means single crystal natural diamond.