

316LVM

Melt Practice

This austenitic stainless steel is initially electric-arc melted. Then as a refinement to the purity and homogeneity of the metal, 316LVM is Vacuum Arc Remelted (VAR). This process yields a more uniform chemistry with minimal voids and contaminants. 316LVM is unique nomenclature for Fort Wayne Metals. This alloy meets the requirements of 316LS.

Typical Chemistry		
	FWM Avg. Wt. %	ASTM F138
Carbon	.023	.03
Manganese	1.84	2.00
Silicon	.37	.75
Phosphorus	.014	.025
Sulphur	.001	.01
Chromium	17.57	17-19
Nickel	14.68	13-15.0
Molybdenum	2.79	2.25-3
Copper	.03	.5
Nitrogen	.03	.1
Iron	Balance	Balance

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

Physical Properties

Density	0.287 lbs/in ³
Modulus of Elasticity	27.9 psi x 10 ⁶
Electrical Resistivity	740 μohms-mm
Thermal Conductivity	16.3 W/m K (100°C)

Thermal Treatment

A reducing atmosphere is preferred for thermal treatment, but inert gas can be used. 316LVM will fully anneal at 1010-1121°C in just a few minutes. The precipitation of carbides that decreases corrosion resistance in other 300 series alloys is controlled by a reduced carbon content in 316LVM.

Applications

316LVM material has been used for permanent implants for many years. The corrosion resistance in the annealed condition is good. Many studies for new alloys use 316LVM as a reference. This stainless steel has good ductility in the cold worked condition. Applications include: suture wire, orthopaedic cables, skin closure staples, catheters, stylets, bone pins and many small machined parts.

Mechanical Properties			
% CW	Y.S. (psi)	U.T.S. (psi)	% Elongation (10" gage length)
0%	45,000	91,000	42%
20%	110,000	123,000	8%
37%	145,000	160,000	2.5%
50%	161,000	176,000	2.2%
60%	170,000	191,000	2.1%
68%	176,000	203,000	2.5%
75%	191,000	218,000	2.6%
80%	186,000	217,000	2.6%
84%	202,000	227,000	2.6%
90%	205,000	238,000	2.6%
93%	212,000	239,000	2.6%
95%	213,000	246,000	2.8%

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" are finished with polycrystalline dies and exhibit a rougher surface than natural diamond 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.