316LVM Datasheet
Medical Wire

Zapp is certified according to ISO 9001

316LVM is a molybdenum-alloyed vacuum arc-remelted stainless steel for the production of both temporary and permanent implants.

The grade is characterized by:
- High strength
- High fatigue strength
- Excellent microcleanliness
- Excellent structural homogeneity
- High surface finish

Standards
- UNS: S31673
- DIN: X 2 CrNiMo18-15-3

Product Standards
- Bar and wire: ASTM F138

Forms of Supply

Wire, spools/coils
Size range:
- Spools: 0.010 - 2 mm (0.0004 - 0.79 in.)
- Coils: 1 - 5 mm (0.039 - 0.197 in.)

The wire in spools/coils is delivered bright drawn.

Tolerances
- Ground bars: h8 as standard, h6 on request
- Drawn in coil/spool: D2

Tighter tolerances can be offered on request.

Wire, straightened lengths
- Bright drawn: diameter 0.60 - 5.0 mm (0.02 - 0.197 in.)
- Ground diameter: 0.6 - 10 mm (0.02 - 0.394 in.)

Tolerances
- Drawn, straightened: h9

Tighter tolerances to be discussed in each and every individual case

Other Product Forms
316LVM can also be supplied as bar (round).

Chemical Composition (nominal) %

C	Si	Mn	P	S	Cr	Ni	Mo	Cu	N
≤ 0.025	0.6	1.7	≤ 0.025	≤ 0.003	17.5	14.0	2.8	≤ 0.10	≤ 0.10

Mechanical Properties

Mechanical properties in the 'as delivered' condition

Product form	Condition	Tensile strength		Proof strength		Elongation A	Hardness, Brinell
		R_m		$R_{p0.2}$			
		MPa	ksi	MPa	ksi	%	
		min	min	min	min	typical	typical
Bar, wire	Annealed	490	71	190	28	45	160
Bar, wire	Medium tensile	900	131	700	101	15	285
Bar, wire	High tensile	1100	160	800	116	12	300
Bar, wire	Extra high tensile	1400	203	-	-	-	-

Note that extra high tensile strength can be achieved for diameter ≤ 5 mm.

Physical Properties

Property		
Density (20 °C)	8.0 g/cm^3	0.29 lb/in^3
Modulus of elasticity, x10^3 (20 °C)	200 MPa	29.0ksi
Specific heat capacity (20 °C)	485 J/(kg · °C)	0.11Btu/(lb · °F)
Thermal conductivity (20 °C)	14W /(m · °C)	8 Btu/(ft h · °F)
Thermal expansion, x10^{-6} (30 - 100 °C)	16.5 per °C	9.5 per °F

Corrosion Resistance

316LVM has very good resistance in physiological environments to:

- General and intergranular corrosion due to high purity and low ferrite content
- Pitting and crevice corrosion due to the high molybdenum content

316LVM is capable of passing the Moneypenny Strauss intergranular corrosion test, in accordance with ISO/ASTM requirements.

Applications

316LVM is used for implant applications; hip stems, femoral heads, spinal systems, acetabular cups, intramedullary nails, bone screws, knee joints, and pins, bone and nail plates, internal fixation devices, dental implants, staples.
This grade is also used for cardiovascular applications: guide wires, cardiac stents and for surgical instruments and tools; blood lancets, stylets, trocars.

Machining

	Hardness	Cutting speed range	Feed range		
		SFM	m/min	IPR	mm/rev
Turning	160 - 300	900 - 145	275 - 45	0.002 - 0.024	0.05 - 0.6
Milling	160 - 300	870 - 165	265 - 50	0.002 - 0.016	0.05 - 0.4
Drilling	160 - 300	115 - 195	35 - 60	0.002 - 0.012	0.05 - 0.3

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