Alleima® 316LVM

Bar

Datasheet

Alleima® 316LVM is a vacuum remelted, molybdenum alloyed, austenitic stainless steel.

The grade is characterized by:

- High strength
- High fatigue strength
- Excellent microcleanliness
- Excellent structural homogeneity
- High surface finish

Standards

- UNS: S31673
- DIN: X 2 CrNiMo 18 15 3

Product standards

- Bar and wire: ASTM F138

Chemical composition (nominal)

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	2.8	≤0.10	≤0.10

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Applications

Alleima® 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.

Corrosion resistance

Alleima® 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

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

Forms of supply

Alleima® 316LVM is supplied as both billet and hot-rolled round bar.

Other product forms

Alleima® 316LVM can also be supplied as tube (thick wall or thin wall) and wire.

Mechanical properties

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				
Tube, thick wall	Bright annealed	515-690	75-100	220	32	min 45	155-210
Tube, thick wall	Cold finished	860-1100	125-160	690	100	min 12	260-330
Profile	Cold rolled	860-1100	125-160	690	100	12	260-330
Tube , thin wall	Annealed	490-690	71-100	190	28	40	

Tube, thin wall	Cold worked	860-1100	125-160	690	100	12

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

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