

316LVM, 1.4441, UNS S31673 Implant Steel – Data Sheet US



Zapp is certified to ISO 9001



316LVM, 1.4441 – Surgical Steel

Zapp® 1.4441 LA is a stainless medical steel especially developed for medical stainless steel implants.

Due to the remelting procedure this medical steel indicates excellent microstructural cleanliness and high fatigue strength.

Internationally, the material is known as AISI 316LVM. The standard ASTM F138 specially refers to rods and wires for surgical implants made of this material; which corresponds to UNS S31673 in the UNS systematics.

An optimized chemical composition guarantees high corrosion resistance, biocompatibility and antimagnetic behavior.

Typical Applications of 316LVM

Implant steel for Medical Devices in the area of osteosynthesis

- Boneplates and screws
- System for hip screws
- Intramedullary nails
- High-strength Steinman-pins and fixing systems
- Cerclage-wire
- Coronary stents and minimal invasive instruments

[Information about further medical applications at Zapp.](#)

Corresponding Standards

- AISI 316LVM
- 1.4441 (X2CrNiMo18-15-3) acc. to the Register of European Steels
- UNS S31673

according to

- ASTM F138
- ISO 5832-1

Weldability

The material Zapp® 1.4441 LA is weldable.

Due to the fact that welding influences the microstructural constitution at the heat affected zone, this procedure is not recommended. Before welding a substantial validation is required.

Polishability

The material Zapp® 1.4441 LA shows an excellent polishability.

Magnetism

The material Zapp® 1.4441 LA shows no magnetic properties. Also after high forming process the microstructure remains fully austenitic without any magnetic properties.

Cold Working

The material Zapp® 1.4441 LA indicates good properties for cold-workability.

Heat Treatment

Solution Annealing:

Temperature: 1,832 – 2,012 °F

Rapid Cooling.

Corrosion Resistance

The material Zapp® 1.4441 LA indicates high resistance to intergranular corrosion, pitting and crevice corrosion.

Typical Chemical Composition

C	Si	Mn	Cr	Ni
max. 0.03	max. 0.75	max. 2.00	17.0-19.0	13.0-15.0
Mo	S	P	Other	
2.25-3.00	max. 0.010	max. 0.025	N max. 0.1 Cu max. 0.5	

Mechanical Properties

Condition *	Yield strength [ksi]	Tensile strength [ksi]	Elongation [%]
Solution annealed	min. 27	min. 71	min. 40
cold worked	min. 100	min. 125	min. 12
extra hard	-	min. 203	-

* Other conditions available on request.

Physical Properties

Modulus of Elasticity E at 70°F	[ksi]	29,007
Specific Gravity ρ	[kg/dm³]	0.29
Thermal Conductivity λ at 70°F	[Btu in/ hr ft² °F]	104.1
Coefficient of thermal Expansion α	[μ in/in °F]	
210 °F		9.2
390 °F		9.7
570 °F		9.7
750 °F		10.3
930 °F		10.3
1110 °F		10.6
1290 °F		10.8
Specific Heat c at 70°F	[Btu/lb °F]	0.11
Electric Resistivity ρ at 70°F	[Ω circularmil/ ft]	0.0012

Please see our linecard of implant steel and further medical grades.

Information about implant steel and further medical grades at Zapp.

MEDICAL ALLOYS

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Further information regarding our products and locations are available in our image brochure and under www.zapp.com

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