Alleima® High-N for medical applications

Tube and pipe, seamless

Datasheet

Alleima® High-N is a molybdenum and nitrogen alloyed austenitic stainless steel, used for orthopedic implants and fracture fixation devices.

The grade is characterized by:

- Proof strength is up to twice that of Alleima® 316LVM in the annealed condition
- Higher corrosion resistance than Alleima® 316LVM
- High microcleanliness
- Very good surface finish
- Good forgeability

Standards

- UNS: S31675
- BS: 7252-9

Product standard

- ASTM F1586

Chemical composition (nominal)

Chemical composition (nominal) %

C	Si	Mn	P	S	Cr	Ni	Mo	Cu	N	Nb
≤0.06	≤0.60	4.0	≤0.025	≤0.003	20.5	9.5	2.4	≤0.20	0.4	0.3

Datasheet last updated 2023-11-09 14:41:16 (supersedes all previous editions)

Applications

Alleima® High-N grade is used for hip and knee joints and fracture fixation devices.

Corrosion resistance

Alleima® High-N has a 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® High-N is capable of passing the Moneypenny Strauss corrosion test in accordance with ISO / ASTM requirements.

Forms of supply

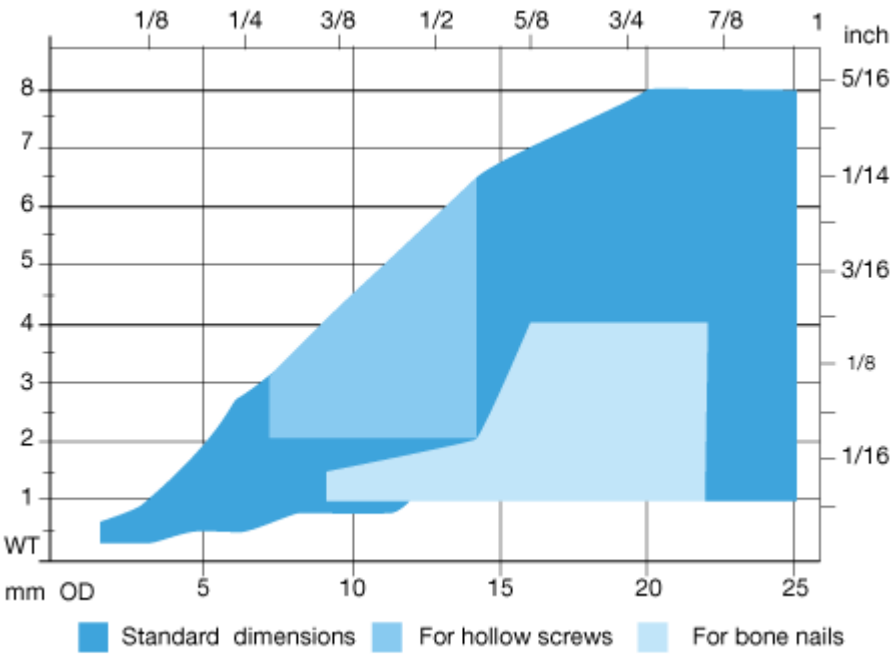
Tube

- Bright annealed
- Cold finished
- Ground outside surface

Tolerances

The tolerances for OD and ID, excentricity and straightness are determined in accordance with customers' requirements.

Alleima standard: OD and ID ± 0.04 mm (0.0016 in.); excentricity max. 5%



Other product forms

Alleima High-N can also be supplied as bar.

Mechanical properties

Product	Condition	Tensile strength		Proof strength		Elongation A,
		R_m		$R_{p0,2}$		%
		MPa	ksi	MPa	ksi	
		min	min	min	min	typical
Wire		1500 max	217 max			
Bar	Annealed	740	107	430	62	35
Bar	Medium	1000	145	700	102	20
Bar	Hard	1100	160	1000	145	10
Tube, thick wall	Bright annealed	740	107	430	62	min 35
Tube, thick wall	Cold finished	1200	174	1100	160	min 10

Specific tensile requirements available on request

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	250-400	885-145	270-45	0.002-0.024	0.05-0.6
Milling	250-400	855-245	260-75	0.002-0.016	0.05-0.4
Drilling	250-400	115-195	35-60	0.002-0.012	0.05-0.3

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