JACQUES ALLEMANN
NOTZ group advanced metal solutions

1.4441

Description	X2CrNiMo18-15-3	EN Norm	AFNOR	AISI	DIN
		1.4441	Z 2 CN 18.13.3	316 LVM	X2CrNiMo18-15-3

Chemical analysis

Fe	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	N
Rest	≤ 0.030	≤ 0.75	≤ 2.00	0.025	≤ 0.01	17-19	2.5-3.0	13.5-15.5	≤ 0.5	≤ 0.1

Values (Weight %). In order to achieve maximum homogeneity and consistent quality, the actual manufacturing tolerances are tighter and more precisely than the composition indicated.

Diameter

Ø 0,02 – 4,00 mm
The product can be supplied as round material (round shape) or in customer-specific geometries or shapes.

Main technical properties and features

Application
1.4441 is categorized as stainless, austenitic, chrome nickel molybdenum steel. By swaging the material, the ultimate tensile strength can be increased considerably. Like other steels in this category, 1.4441 has 17% Chrome, approx. 14% Nickel and a substantial quantity of Molybdenum. Due to the high proportion of Nickel, the material keeps its austenitic structure.
1.4441 is a variant of 1.4404 / 1.4435 steel, which is then melted in a vacuum, causing the 1.4441 to have an exceptionally high purity. Consequently, it is usually used in the production of medicinal components. When considering materials for the manufacturing of implants, nails, plates or instruments, many corporations in medicinal branches designate 1.4441 as a first choice. Due to its surface finish, it is readily polished.

Resistance to Corrosion
1.4441 has an extremely high resistance to corrosion. The chrome, nickel, molybdenum alloy defies most acids and complies with the ISO 5832-1 and ASTM F-138 norms for implants and instruments. As a result of its low carbon content, 1.4441 doesn't form chromium carbide during welding and no further heat treatment is needed thereafter.

Thermal Treatment
1.4441 is annealed between 1050ºC and 1120ºC after which it is quenched in water, or in a cold air stream. It cannot be hardened in the classical sense.

Weldability
1.4441 can be welded with whatever method is desired, without requiring any extra processing later.

Surface finish

Finish	Cleaning	Diameter				
Drawn	Chemically purged	Ø	0.020	–	3.499	mm
Surface ground	Chemically purged	Ø	3.500	–	4.000	mm

Delivery type:
- In rings
- On assorted spools
- straightened
- Axles

Diameter tolerances

Diameter mm			Tolerance %	Tolerance µ
0.020	–	0.249	-	± 1.0
0.250	–	0.399	-	± 1.5
0.400	–	1.500	-	± 2.0
1.500	–	4.000	-	± 2.5

Mechanical properties

Delivery condition mm			Ultimate tensile strength in cold-twisted delivery condition
0.005	–	0.019	950 – 2250*
0.020	–	0.199	950 – 2250*
0.200	–	0.499	950 – 2250*
0.500	–	0.999	950 – 2250*
1.000	–	1.999	950 – 2250*
2.000	–	4.000	950 – 2250*

* higher tensile strengths on request

Physical properties

Density		7.98	g/cm³
Coefficient of Thermal Expansion	20 ºC – 200 ºC	16.50	10^{-6}/K
Specific Heat Capacity	20 ºC	500.00	J/kgK
Thermal Conductivity	20 ºC	15.00	W/mK
Specific Electric Resistance	20 ºC	0.75	Ω mm^2/m
Young's Modulus	20 ºC	200.00	GPa

Note

All information provided in this data sheet is based on best knowledge and the latest state of technology, but without guarantee. The use of materials should always be discussed with our sales specialists or materials laboratory on a product- and application-specific basis.

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