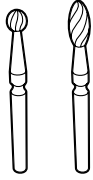


1.4028, AISI 420B, ASTM F899

Medical Steel for Instruments - Datasheet



Zapp is certified to ISO 9001



Grade 1.4028 from Zapp – Steel for Instruments

Zapp® 1.4028 YN is a Material for Medical Instruments According to ASTM F899 and AISI 420B

Zapp® 1.4028 YN is a stainless martensitic chromium steel. This grade shows better spring properties than austenitic or ferritic steel and improved fatigue strength under corrosive stress.

Requirement for this is a low-hardened and tempered condition and a shiny, preferably polished surface. In high tempered or annealed condition, the corrosion resistance is reduced.

Typical Applications

- Rotary instruments
- Cutter
- Curettes

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

Polishability

Zapp® 1.4028 YN is polishable.

Weldability

Zapp® 1.4028 YN is usually not welded.

If welding is unavoidable, the following precautions should be taken: preheating to a temperature range of 300 – 400 °C. Furthermore, annealing after welding is required to regain a certain degree of ductility.

Machining

During machining processes, Zapp® 1.4028 YN behaves similarly to unalloyed structural steel of the same hardness. Tools should be made of quality high-speed steel or carbide.

Magnetism

Zapp® 1.4028 YN is magnetizable.

Hot Working

Forging temperature is 1100 – 800 °C

Slow cooling

Corrosion Resistance

Zapp® 1.4028 YN has sufficient resistance in moderate, non-chlorine-containing media. Good corrosion resistance can be observed in oxidizing atmospheres at temperatures exceeding 600 °C. Best corrosion resistance can be achieved with polished surface in the quenched and tempered condition.

Corresponding Standards

DIN EN 10088-3 (X30Cr 13)

ASTM F899, AISI 420B (UNS S42000)

Typical Chemical Composition

C	Si	Mn	P	S	Cr
0.26–0.35	max. 1.00	max. 1.00	max. 0.040	max. 0.030	12.00– 14.00

Mechanical Properties (Annealed)

Tensile strength R _m	[MPa]	max. 800
Hardness HB		max. 245

Mechanical Properties (Quenched and Tempered)

Tensile strength R _m	[MPa]	850 - 1000
Yield strength R _{p0.2}	[MPa]	min. 650
Elongation A	[%]	min. 10

[Information on implant steel and other medical materials at Zapp.](#)

Physical Properties

Modulus of Elasticity E 20° C	[GPa]	215
Specific Density ρ	[kg/ dm ³]	7.7
Thermal Conductivity λ at 20°C	[W/ m*K]	30
Coefficient of Thermal Expansion α	[10 ⁻⁶ * K ⁻¹]	
20 - 100 °C		10.5
20 - 200 °C		11.0
20 - 300 °C		11.5
20 - 400 °C		12.0
20 - 500 °C		12.0
Specific Heat c at 20°C	[kJ/ kg*K]	460
Specific Electric Resistivity ρ at 20°C	[Ω *mm ² / m]	0.65

Heat Treatment

Soft Annealing

Temperature: 745 – 825 °C

Cooling: Air

Hardening

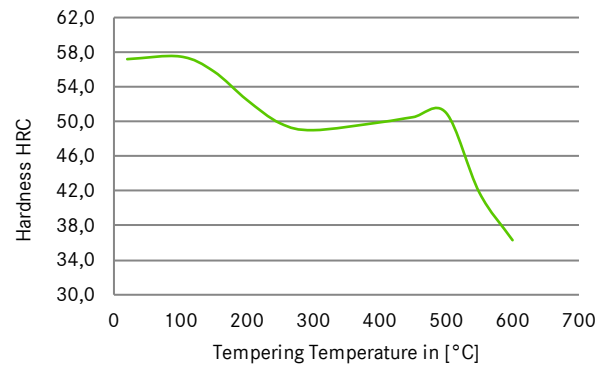
Temperature: 950 – 1050 °C

Cooling: Oil, Air

Tempering

Temperature: 625 – 675 °C

Tempering Diagram [1,050 °C/ 0.5 h/ Oil]



Please see our [linecard of grades for medical instruments and further medical grades](#).

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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