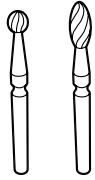


# 1.4028, AISI 420B, ASTM F899

## Medical Steel for Instruments - Datasheet US



Zapp is Certified to ISO 9001



### Grade 1.4028 from Zapp – Steel for Instruments Ergste® 1.4028 YN is a Material for Medical Instruments According to ASTM F899 and AISI 420B

Ergste® 1.4028YN 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

Ergste® 1.4028YN is polishable.

#### Weldability

Ergste® 1.4028YN is usually not welded.

If welding is unavoidable, the following precautions should be taken: preheating to a temperature range of 572 – 752 °F. Furthermore, annealing after welding is required to regain a certain degree of ductility.

#### Machining

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

#### Magnetism

Ergste® 1.4028YN is magnetizable.

#### Hot Working

Forging temperature is 2,012 – 1,472 °F  
Slow cooling

#### Corrosion Resistance

Ergste® 1.4028YN 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 <sub>m</sub>	[ksi]	max. 116.0
Hardness HB		max. 245

#### Mechanical Properties (Quenched and Tempered)

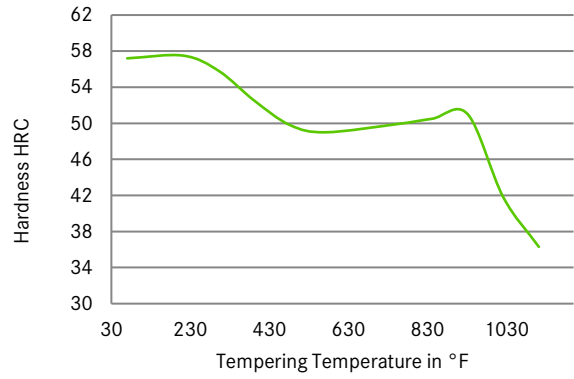
Tensile strength R <sub>m</sub>	[ksi]	123.3 – 145.0
Yield strength R <sub>p0.2</sub>	[ksi]	min. 94.3
Elongation A	[%]	min. 10

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

**Physical Properties**

Modulus of Elasticity E 70°F	[ksi]	31,181
Specific Density ρ	[lb/ in³]	0.28
Thermal Conductivity λ at 70°F	[Btu in/hr ft²°F]	208.0
Coefficient of Thermal Expansion	[µin/in °F]	
	70 - 210 °F	5.8
	70 - 390 °F	6.1
	70 - 570 °F	6.4
	70 - 750 °F	6.7
70 - 930 °F	6.7	
Specific Heat c at 70°F	[Btu/lb °F]	0.11
Specific Electric Resistivity ρ at 70°F	[ circularmil/ft]	391

**Tempering Diagram [1922 °F/ 0.5 h/ Oil]**



**Heat Treatment**

**Soft Annealing**

Temperature: 1,273 – 1,517 °F

Cooling: Air

**Hardening**

Temperature: 1,742 – 1,922 °F

Cooling: Oil, Air

**Tempering**

Temperature: 1,157 – 1,247 °F

[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](http://www.zapp.com)

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