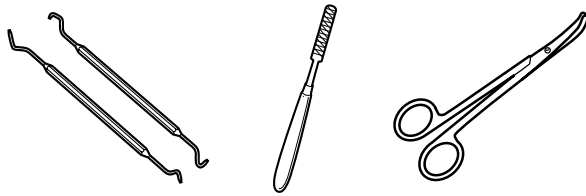


Zapp® 1.4021 YB Data Sheet

Medical Alloys



Zapp is certified to ISO 9001



Material Zapp® 1.4021 YB

Zapp® 1.4021 YB is a martensitic stainless chromium steel that is corrosion resistant to water and steam. This requires the hardened and low tempered state and a shiny, polished surface preference. In the high-tempered or annealed condition, the corrosion resistance is reduced.

Typical Applications

Dental applications

Surgical instruments e.g.

- _ retractor/ surgical hooks
- _ Tweezers
- _ Scissors
- _ Ring pliers
- _ Bone Cutting Forceps
- _ Probes
- _ Chisels

Polishability

The polishing ability of Zapp® 1.4021 YB is very good.

Weldability

Welding is only possible when certain precautions are taken. Generally, welding is not recommended.

Machinability

Machining conditions of Zapp® 1.4021 YB equalize with unalloyed mild steel.

Magnetism

Zapp® 1.4021 YB is magnetizable.

Hot Working

Forging at 1,100 – 800 °C, slow cooling.

Corrosion Resistance

Due to its chromium content, Zapp® 1.4021 YB shows good corrosion resistance in moderately aggressive, non-chlorine-containing media, such as soaps, solvents and organic acids. This steel is also scaling resistant to oxidizing atmosphere at temperatures up to 600 °C.

Corresponding Standards

DIN EN 10088-3 (X20Cr13)

ASTM F899, AISI 420A (UNS S42000)

Chemical Composition *

C	Si	Mn	P	S	Cr
0.22	0.45	0.80	0.02	0.02	12.30

* Average in mass -%

Product Conditions*

Bars, drawn, straightened, ground, polished	Tensile [MPa]	650 - 850
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* Other conditions on request

Physical Properties

Modulus of Elasticity at 20 °C [GPa]	215
Specific Gravity ρ [kg/dm³]	7.7
Thermal Conductivity λ at 20 °C [W/m*K]	30
Coefficient of Thermal Expansion α [$10^{-6} \cdot K^{-1}$]	
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 at 20 °C [kJ/kg*°C]	460
Electric Resistivity ρ at 20 °C [$\Omega \cdot mm^2/m$]	0.60

Heat Treatment

Soft Annealing

Temperature: 745 – 825 °C

Cooling: Air

Hardening

Temperature: 950 – 1,050 °C

Cooling: Oil, air

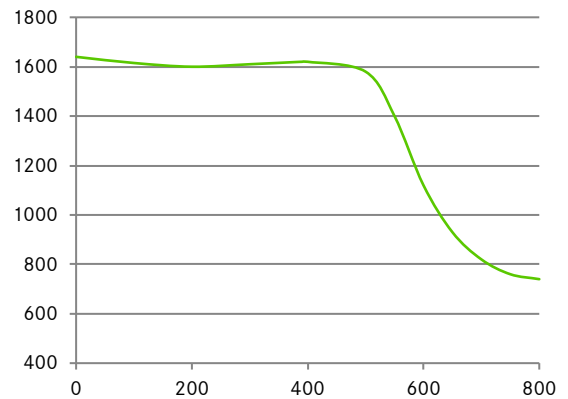
Tempering

Temperature I: 650 – 750 °C

Temperature II: 600 – 700 °C

Tempering Chart

Tensile strength [MPa]



Tempering temperature [°C]

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