Ergste® 1.4104YN Datasheet
Medical Alloys

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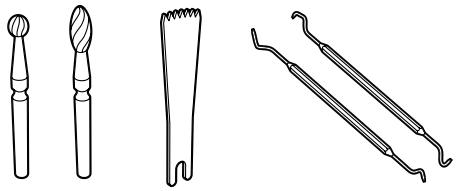

Ergste® 1.4104YN

Ergste® 1.4104YN is a martensitic stainless steel with 17% of Chromium content. Due to the high content of Sulfur an increased machinability is achieved. On the other hand, this leads to both decreased corrosion resistance and ductility. Ergste® 1.4104YN shows a good resistance to rust and acid. Further, it is possible to improve the mechanical resistance because of the carbon content. The improvement can be achieved by quenching and tempering.

Typical Applications

- Surgical instruments
- Decorative purposes
- Construction parts that show resistance in water and
- steam environments
- General machine and apparatus parts
- Piston rods for pneumatic cylinders

Weldability

Generally, Ergste® 1.4104YN is not welded. The material is particularly unsuitable for joint welding. If welded, it is recommended to finish with a heat treatment to ensure the equality of the mechanical-technological properties in the welding zone and the base material

Polishability

Ergste® 1.4104YN is not suitable for polishing.

Magnetism

Ergste® 1.4104YN is magnetizable.

Corrosion Resistance

Ergste® 1.4104YN has a worse corrosion resistance than Ergste® 1.4016IH. The resistance to chlorinated media is impaired due to high content of sulfur. Plus, media that cause pitting and crevice corrosion should be avoided.

Corresponding Standards

- according to DIN EN 10088-3 (X14CrMoS17)
- according to AISI 430F

Chemical Composition

	C	Si	Mn	Cr	Mo	P	S
Min.	0.10	0	0	15.5	0.2	0	0.15
Max.	0.17	1.0	1.5	17.5	0.6	0.04	0.35

Mechanical Properties (Solution-Annealed)

Tensile Strength	TS/[Mpa]	max. 730
Hardness	HB	max. 220

Mechanical Properties (Quenched and Tempered)

Tensile Strength	R_m/[Mpa]	650 - 850
Yield Strength	$YS_{0,2}$/[MPa]	min. 500
Elongation at break, t ≤ 60 mm	A_5/[%]	min. 12
Elongation at break, 60 mm < t ≤ 160 mm	A_5/[%]	min. 10

Physical Properties

Modulus of Elasticity at 20 °C	E/[GPa]	215
Density	ρ/[kg/dm³]	7.7
Thermal Conductivity at 20°C	λ [W/m*K]	25
Coefficient of Thermal Expansion 20 – 100 °C 20 – 200 °C 20 – 300 °C 20 – 400 °C	α [10^{-6}*K^{-1}]	 10.0 10.5 10.5 10.5
Specific Heat at 20 °C	c/[kJ/kg*K]	0.46
Specific Electric Resistivity at 20 °C	ρ/[Ω*mm²/m]	0.7

Hot Working
Hot working is to be performed at temperatures between 800 °C and 1,100 °C. Start with slow heating to approximately 850 °C.
Cooling in Air.

Cold Working
Ergste® 1.4104YN is not suitable for cold working because of the sulfur precipitation.

Machining
The machining of Ergste® 1.4104YN is better in comparison to other steels with 17% content of chrome. The reason for that is the increased content of sulfur.

Heat Treatment

Soft Annealing
Temperature: 750 °C – 850 °C
Cooling: Oven, Air

Hardening
Temperature: 950 °C – 1070 °C
Cooling: Quickly enough in oil, air

Tempering
Temperature: 550 °C – 550 °C
Cooling: Air

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