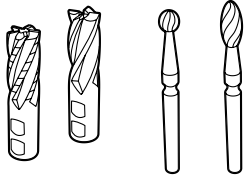


Ergste® 9.9200GA Magnetizable | Hardenable Datasheet Medical Alloys



Zapp is Certified to ISO 9001



Material Ergste® 9.9200GA

Ergste® 9.9200GA is a precipitation hardenable 12% chromium nickel steel with outstanding corrosion resistance and impact toughness. Despite high strength this quality can be formed relatively well. By appropriate cold forming / heat treatment is a hardness of max. 51 HRC* to reach.

* maximum achievable hardness under ideal hardening conditions

Typical Fields of Application

- Surgical instruments (e.g. drills)
- Cutting instruments (e.g. rasps)

Magnetism

Ergste® 9.9200GA is magnetizable.

Weldability

Easily welded with fusion welding (e.g. MIG, TIG) and resistance welding; ideally in the solution condition. Preheating is not necessary. Gas fusion welding with oxygen-acetylene flame should be avoided, as this may cause it to carburization.

Cold Working

For massive cold working the solution-annealed condition (condition A) shall be ordered.

Corresponding Standards

- No corresponding description

Typical Chemical Composition *

C	Mn	Cr	Ni	N	Ti	Mo
< 0.030	0.20	12.00	8.90	<0.030	1.60	2.00

* Average in mass-%

Mechanical Properties*

Condition	Tensile strength Rm [MPa]	Yield strength Rp _{0.2} [MPa]	Elongation A [%]	Reduction of area Z [%]	Hardness HRC/HB
A	1,070	890	10	66	35.0
H900	1,890	1,770	5	20	51.5
H950	1,850	1,730	6	40	50.5
H1000	1,690	1,490	8	50	48.8
CW full hard + aged	2,730	2,700	1	-	-

* Average values

Physical Properties

Modulus of Elasticity E at 20°C	[GPa]	200
Specific Density ρ	[kg/dm³]	7.81
Thermal Conductivity λ at 20°C	[W/m*K]	15.83
Coefficient of Thermal Expansion α	[10 ⁻⁶ *K ⁻¹]	
20 - 100 °C		10.3
20 - 200 °C		10.8
20 - 300 °C		10.9
20 - 400 °C		11.1
20 - 500 °C		10.9
Specific Heat c at 20°C	[kJ/kg*°C]	-
Electric Resistivity ρ at 20°C	[Ω*mm²/m]	0.82

Hot Working

Forging at 1,010 – 1,093 °C

The final temperature should be in the range 820 - 930 °C, in order to adjust the optimal grain size and properties after hot working. Slow cooling in air.

Forgings must be solution treated prior to precipitation hardening.

Heat Treatment

Solution Annealing

Temperature: 980 ± 15 °C

Cooling: Furnace, air

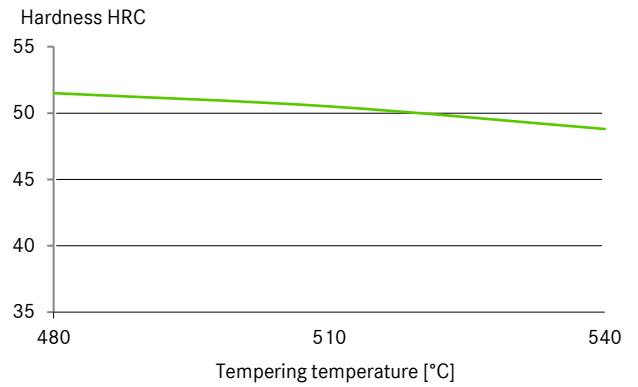
Precipitation Hardening

Temperature: 480 – 540 °C

Holding time: ca. 4 h (depending on material mass)

Cooling: Air

Tempering Chart



Corrosion Resistance

Better corrosion resistance than 1.4542 (UNS S17400) and 1.4543 (UNS S45500). Ergste® 9.9200GA shows good corrosion resistance in normal air atmosphere and no corrosion in fresh water.

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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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