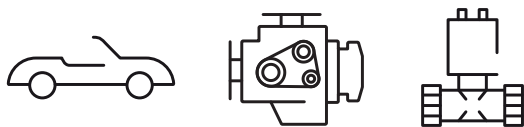


Zapp is Certified to ISO 9001 | IATF 16949



Classification

- Ferritic, corrosion-resistant steel
- Material No: 9.9013

Typical Field of Application

Ergste® 9.9013IL has excellent magnetic properties and is therefore primarily used for solenoid valves in pneumatic, hydraulic and HVAC applications. Ergste® 9.9013IL combines the excellent magnetic properties of a 12% Cr steel (Ergste® 1.4005IA) with the good corrosion resistance of an 18% Cr steel (Ergste® 1.4105IL) with good machinability at the same time

Corrosion Resistance

Ergste® 9.9013IL has a very good corrosion resistance.

Machinability

Due to the sulfur content, Ergste® 9.9013IL is very suitable for machining.

Weldability

Ergste® 9.9013IL is in certain limits weldable. Welding is impaired by the presence of manganese sulfide inclusions.

For **improved properties** in different areas, we recommend the following Ergste® qualities:

Corrosion Resistance

Ergste® 1.4523IM
Ergste® 1.4113IM

Cold Heading

Ergste® 1.4016IM
Ergste® 1.4523IM

Machinability

Ergste® 1.4105IL

Further materials under:

<https://www.zapp.com/en-uk/materials/stainless-steel>

Typical Chemical Analysis [Mass-%]

C	Si	Mn	P	S	Cr	Mo
≤ 0.02	1.2-2.0	≤ 1.0	≤ 0.04	0.15-0.35	12.00-14.00	~ 0.4

Mechanical Properties

Tensile strength R_m	350 - 550 MPa
Yield strength R_e	≥ 320 MPa
Elongation A_5	≥ 35 %

Physical Properties

Density ρ	7.6 kg/dm ³
Modulus of elasticity E at 20 °C	210 GPa
Thermal conductivity λ at 20 °C	17.15 W/(m*K)
Coefficient of thermal expansion α	(10 ⁻⁶ K ⁻¹)
20 - 100 °C	12.7
20 - 200 °C	13.1
20 - 300 °C	13.5
20 - 400 °C	13.9
Specific heat c at 20 °C	450 J/(kg*K)

Magnetic Properties of Round Bars

Coercivity H_c	< 150 A/m
Max. permeability μ_{max}	> 3,000
Saturation polarization J_s	~ 1.60 T
Remanence B_r	1.70 T
Specific electrical resistance ρ	> 0.60 $\mu\Omega m$
Electric conductivity at 20 °C	> 0.55 1/($\mu\Omega * m$)

Delivery Forms

Bar	annealed, ground
Profile	annealed, straightened

Surface Finish

Crack test according to. DIN EN 10277,
Surface quality class 1-4

For **improved properties** in different areas, we recommend the following Ergste® qualities:

Magnetic Properties

Ergste® 1.4005IA

Ergste® 1.0715

Weldability

Ergste® 1.4511IA

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