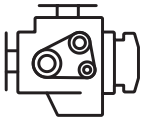
1.4113 IM, AISI 434 mod.
Automotive & Automation, Data Sheet

Zapp is certified to ISO TS 16949

Categorization of Material 1.4113 IM

- Ferritic, corrosion resistant steel
- AISI 434 mod.

Typical Applications

Material 1.4113 IM from Zapp is mainly used in solenoid valves for pneumatic and hydraulic applications with higher requirements for corrosion resistance like in medical equipment.

Processing and Usage Properties

Ergste® 1.4113 IM (similar to X6CrMoS17-1) is a stainless free cutting steel with excellent soft magnetic properties. It is designed for the volume production of precision turned parts.

Its high molybdenum content provides a very good corrosion resistance in water, steam and other moderate aggressive media. It provides also a higher resistance against pitting corrosion.
If welding is necessary, plasma- or laser welding should be preferred. The steel is suitable for cold forming operations within certain limits.

For improved properties in selective cases we recommend the following Ergste® grades:

Surface Finish

2G DIN EN 10088-3 – Class 1-4

Machinability

Ergste® 1.4105 IM
Ergste® 1.4105 IL
Ergste® 1.4005 IA

Magnetic Properties

Ergste® 1.4005 IA
Ergste® 1.4105 IL
Ergste® 9.9013 IM

Corrosion Resistance

Ergste® 1.4113 IL
Ergste® 1.4523 IM
Ergste® 9.9013 IM

Delivery Forms*

Round bars	Annealed, ground
Profiles	Annealed, straightened

* crack tested according to DIN EN 10277-1, Table 1, Surface class 1-4

Ergste® 1.4113 IM*

C	Si	Mn	P	S	Cr	Mo
< 0.03	< 1.80*	≤ 1.00	≤ 0.04	0.20 – 0.35*	17.0 – 18.5	1.50 – 2.50*

* deviating from the DIN EN

Magnetic Properties*

ø 5.0 – < 6.8 mm

	Value at 20 °C
Saturation polarization J_s	> 1.48 T
Remanence B_r	> 0.5 – 1.1 T
Relative permeability μr_{max}	≥ 1,000
Coercitive strength $_JH_C$	≤ 220 A/m
Specific resistance ρ	> 0.82 µΩm

ø 6.8 – ≤ 27 mm

	Value at 20 °C
Saturation polarization J_s	> 1.48 T
Remanence B_r	> 0.5 – 1.1 T
Relative permeability μr_{max}	≥ 1,500
Coercitive strength $_JH_C$	≤ 180 A/m
Specific resistance ρ	> 0.82 µΩm

* Profiles and other sizes may differ. These values represent our standard properties. Improved properties are possible but must be agreed upon.

Cold Heading

Ergste® 1.4003 IA
Ergste® 1.4016 IM

Information about further automotive applications at Zapp.

Physical Properties

	Short Symbol	Value at 20 °C	Unit
Density	ρ	7.70	$\frac{kg}{dm^3}$
Specific heat	c	460	$\frac{J}{kg \cdot K}$
Heat conduction	λ	25	$\frac{W}{K \cdot m}$
Specific electrical Resistance	ρ	0.82	$\frac{\Omega \cdot mm^2}{m}$
Modulus of elasticity	E	220	$\frac{kN}{mm^2}$

Heat Treatment

	Hot working	Soft annealing
Temperature [°C]	750 – 1,050	750 - 850
Cooling	Air	Air

Further information: Please see our linecard for solenoid valves products.

Mechanical Properties

Annealed

	Short Symbol	Value at 20 °C	Unit
Tensile strength	Rm	400 - 600	MPa
Yield strength	$Rp_{0,2}$	≥ 280	MPa
Elongation	A5	≥ 18	%
Hardness HB30	HB30	≤ 200	

Information about other stainless steel solenoid valves at Zapp.

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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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