

# 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\*

#### ∅ 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 $\mu_{rmax}$	≥ 1,000
Coercitive strength $jH_c$	≤ 220 A/m
Specific resistance $\rho$	> 0.82 $\mu\Omega m$

#### ∅ 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 $\mu_{rmax}$	≥ 1,500
Coercitive strength $jH_c$	≤ 180 A/m
Specific resistance $\rho$	> 0.82 $\mu\Omega m$

\* 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	$\rho$	7.70	$\frac{\text{kg}}{\text{dm}^3}$
Specific heat	c	460	$\frac{\text{J}}{\text{kg} \cdot \text{K}}$
Heat conduction	$\lambda$	25	$\frac{\text{W}}{\text{K} \cdot \text{m}}$
Specific electrical Resistance	$\rho$	0.82	$\frac{\Omega \cdot \text{mm}^2}{\text{m}}$
Modulus of elasticity	E	220	$\frac{\text{kN}}{\text{mm}^2}$

## 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](http://www.zapp.com)

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