1.4005 IA, AISI 416 mod., X12CrS13, Ferritic Stainless Steel, Data Sheet

Zapp is certified to ISO 9001 I IATF 16949

Typical Fields of Application 1.4005 IA
The alloy Zapp® 1.4005 IA offers excellent magnetic properties. It is therefore primarily used for solenoid valves in pneumatic, hydraulic and HVAC applications as well as for high performance valves in injection technology.

Zapp® 1.4005 IA can be cold formed within certain limits.

Information about further automotive applications at Zapp.

Corrosion Resistance
Zapp® 1.4005 IA is resistant to water, steam, and other less aggressive media.

Machinability
Zapp® 1.4005 IA was developed for the series production of precision turned parts and is easy to machine due to the sulfur content.

Weldability
Zapp® 1.4005 IA is limited weldable. Welding is impaired by the presence of manganese sulfide inclusions.

Information about further stainless steel alloys at Zapp.

Surface Finish
Crack test according to. DIN EN ISO 683-7,
Surface quality class 1-4

Typical Chemical Analysis*

C	Si	Mn	P	S	Cr	Mo
≤ 0.02**	≤ 1.00	≤ 1.50	≤ 0.04	0.25-0.35	12.00-14.00	≤ 0.60

* weight percentage/approximate value

** deviation from the DIN EN

Mechanical Properties

Tensile strength R_m	370 – 570 MPa
Yield strength R_e	≥ 220 MPa
Elongation A5	≥ 25 %

Physical Properties

Density ρ	7.7 kg/dm³
Modulus of elasticity E at 20° C	215 GPa
Thermal conductivity λ at 20°C	24.9 W/(m*K)
Specific el. resistance ρ at 20 °C	≥ 0.63 µΩm
Specific heat c at 20 °C	460 J/(kg*K)

Magnetic Properties of Round Bars

Coercivity H_c	≤ 200 A/m
Max. permeability μ_{max}	≥ 1,700
Saturation polarization J_s	≥ 1.70 T
Remanence B_r	0.5 – 1.3 T

Delivery Forms

Bars	annealed, ground

Further information: Please see our linecard.

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

Corrosion Resistance
Zapp® 1.4105 IL
Zapp® 1.4016 IM
Zapp® 1.4113 IM / IL
Zapp® 1.4523 IM
Zapp® 9.9013 IL

Cold Heading
Zapp® 1.4003 IA
Zapp® 1.4016 IM

Machinability
Zapp® 1.4105 IL
Zapp® 9.9013 IL

Magnetic Properties
Zapp® 9.9013 IL
Zapp® 1.0715 QA

Weldability
Zapp® 1.4003 IA
Zapp® 1.4511 IA
Zapp® 1.4523 IM

Overview Magnetic Properties

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Further information regarding our products and locations are available in our image brochure and under www.zapp.com

Last revision: July 2025