

1.4003 IA, 3Cr12, X2CrNi12, Automotive & Automation, Data Sheet



Zapp is certified to ISO 9001 | IATF 16949



Classification Alloy 1.4003 IA from Zapp

- Ferritic, corrosion-resistant chrome steel
- Material number: EN 1.4003
- Short name: X2CrNi12
- AISI: 3Cr12

Typical Application

Ergste® 1.4003 IA offers excellent magnetic properties and is therefore primarily used for solenoid valves in pneumatic, hydraulic and HVAC applications.

Corrosion Resistance

Ergste® 1.4003 IA is resistant to water, steam, and other less aggressive media.

Machining

The 1.4003 IA has a sufficient machinability. For more challenging machining processes, we recommend the free-cutting steel 1.4005 IA with increased sulfur.

Weldability

Ergste® 1.4003 IA has good weldability. A heat treatment (solution annealing) is required for larger dimensions. For **improved properties** in different areas, we **recommend** the following Ergste® qualities:

Corrosion Resistance

Ergste® 1.4113 IM
Ergste® 1.4523 IM

Cold Heading

Ergste® 1.4016 IM

Machining

Ergste® 1.4005 IA
Ergste® 1.4105 IL

Magnetic Properties

Ergste® 1.4005 IA
Ergste® 9.9013 IL
Ergste® 1.0715 QA

Weldability

Ergste® 1.4511 IA

Typical Chemical Analysis [Mass-%]

C	Si	Mn	P	S	Cr	Ni
≤ 0.03	≤ 1.0	≤ 1.5	≤ 0.04	≤ 0.015	10.50-12.50	0.30 - 1.00

Mechanical Properties

Tensile strength R_m	400 - 600 [MPa]
Yield strength R_e	≥ 250 [MPa]
Elongation A_5	≥ 30 [%]

Physical Properties

Density ρ	7.7 kg/dm ³
Modulus of elasticity E at 20 °C	220 GPa
Thermal conductivity λ at 20 °C	25 W/(m ² K)
Coefficient of thermal expansion α	(10 ⁻⁶ K ⁻¹)
20 - 100 °C	10.4
20 - 400 °C	11.6

Magnetic Properties of Round Bars

Coercivity H_c	≤ 180 A/m
Max. permeability μ_{max}	≥ 1,700
Saturation polarization J_s	≥ 1.7 T
Remanence B_r	0.7 - 1.3 T
Specific electrical resistance ρ	≥ 0.55 $\mu\Omega m$

Delivery Forms

Round bars	annealed, ground
Profiles	annealed, ground

Surface Finish

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

[Further alloys are available here.](#)

Please see our linecard for solenoid valves.

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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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