

1.4523, UNS S18235, ASTM A581 / A581M

Ferritic Stainless Free-Cutting Steel, Data Sheet



Zapp is certified to ISO 9001 | IATF 16949



Typical Areas of Application of Material 1.4523

The material Zapp® 1.4523 IA/IM/IH by Zapp is a ferritic stainless **free-cutting steel**.

The material is particularly **suitable** for **solenoid valve** applications in **corrosive** environments

The Zapp® 1.4523 IM **variant** additionally has very good soft magnetic properties.

Corrosion Resistance

Due to its high chromium and molybdenum content and the addition of titanium, Zapp® 1.4523 IA/IM/IH has excellent corrosion resistance.

Machining

Due to the **sulfur** content Zapp® 1.4523 IA/IM/IH has **very good** machining properties.

Weldability

The material Zapp® 1.4523 is **highly weldable**, as it remains **stably ferritic** due to its high chromium and molybdenum content.

Surface Finishes

Crack-tested according to DIN EN ISO 683-7,
Surface finish qualities 1–4

Delivery Forms

Round bars	annealed, ground
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Typical Chemical Composition 1.4523 IA/IM/IH*

C	Si	Mn	P	S	Cr	Mo
≤ 0.025	≤ 1.0	≤ 0.5	≤ 0.04	0.15 – 0.35	17.5 – 18.5	2.0 – 2.5
Ti	Fe					
0.3 – 1.0	bal.					

* Weight percentage/reference value

Mechanical Properties

	1.4523 IM annealed	1.4523 IA annealed	1.4523 IH strain- hardened
	6.8* – 33 mm	> 27 – 70 mm	4 – 27 mm
Tensile strength R _m	430 – 630 MPa	430 – 630 MPa	650 – 850 MPa
Yield strength R _e	≥ 250 MPa	≥ 250 MPa	≥ 500 MPa
Elongation A5	≥ 24 %	≥ 20 %	≥ 9 %

* Smaller sizes on request

Magnetic Properties of Round Bars 1.4523 IM

	6.8* – 27 mm 1.4523 IM	> 27 – 33 mm 1.4523 IM
Coercivity H _c	≤ 240 A/m	≤ 320 A/m
Maximum permeability μ _{max}	≥ 1,500	≥ 1,000
Magnetic polarization J _s	≥ 1.48 T	≥ 1.40 T
Residual magnetism B _r	0.6 – 1.3 T	0.6 – 1.3 T

* Smaller sizes on request

Physical Properties*

Density ρ	7.7 kg/dm ³
Modulus of elasticity E at 20° C	225 GPa
Thermal conductivity λ at 20°C	22 W/(m*K)
Thermal expansion coefficient α	(10 ⁻⁶ K ⁻¹)
20 – 100 °C	10.0
20 – 200 °C	11.0
20 – 400 °C	11.5
Specific electrical resistance p	≥ 0.60 μΩm

* For information only

For improved properties in selected cases we recommend the following grades:

- Weldability: 1.4511 IA
- Magnetic Properties: 9.9013 IL

[Here you can find more materials.](#)

Overview Magnetic Properties



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

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This cannot substitute for comprehensive consultation on the selection of our products and on their use in a specific application. This data sheet is not subject to change control.

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