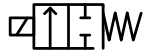


# 1.4523, UNS S18235, ASTM A581 / A581M Ferritic Stainless Free-Cutting Steel, Data Sheet

# ZAPP

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
≤ 0.03	≤ 1.0	≤ 0.5	≤ 0.04	0.15 – 0.35	17.5 – 19.0	2.0 – 2.5
Ti	Fe					
≤ 0.8	bal.					

\* weight percentage/reference value

## Mechanical Properties

	annealed 4 – 33 mm 1.4523 IM	annealed > 27 – 70 mm 1.4523 IA	strain- hardened 4 – 27 mm 1.4523 IH
Tensile strength R <sub>m</sub>	430 – 630 MPa	430 – 630 MPa	650 – 850 MPa
Yield strength R <sub>e</sub>	≥ 280 MPa	≥ 250 MPa	≥ 500 MPa
Elongation A <sub>5</sub>	≥ 24 %	≥ 20 %	≥ 9 %

## Magnetic Properties of Round Bars 1.4523 IM

	4 – 27 mm 1.4523 IM	> 27 – 33 mm 1.4523 IM
Coercivity H <sub>c</sub>	≤ 240 A/m	≤ 320 A/m
Maximum permeability μ <sub>max</sub>	≥ 1,500	≥ 1,000
Magnetic polarization J <sub>s</sub>	≥ 1.40 T	≥ 1.40 T
Residual magnetism B <sub>r</sub>	0.7 – 1.3 T	0.7 – 1.0 T

## Physical Properties

Density ρ	7.7 kg/dm³
Modulus of elasticity E at 20 °C	225 GPa
Thermal conductivity λ at 20 °C	22 W/(m·K)
Thermal expansion coefficient α 20 – 100 °C 20 – 200 °C 20 – 400 °C	(10 <sup>-6</sup> K <sup>-1</sup> ) 10.0 11.0 11.5
Specific electrical resistance ρ	≥ 0.60 μΩm

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

The information, illustrations, drawings, dimensional and weight data, and other data included in this data sheet are intended only for the purposes of describing our products and represent non-binding average values. They do not constitute quality data, nor can they be used as the basis for any guarantee of quality or durability. The applications presented serve only as illustrations and can be construed neither as quality data nor as a guarantee in relation to the suitability of the materials.

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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\*This data sheet is only available in English.