

Hardened tool steel W.-Nr. 1.2003 (75Cr1)**1. Application examples**

A small addition of about 0.40% chromium leads to higher wear resistance and better hardenability with large cross-sections in this carbon steel.

With a Rockwell hardness of 47-51 HRC, this material is also suitable for smaller tools.

Available in sheets in the size 350x1000mm and 610x1220mm, in some thicknesses different sizes are possible (see chapter 5).

In the thickness range between 0.02 and 3.00 mm, the hardened spring steel W.-Nr. 1.1274 is available.

2. Material codes

German Norm:	1.2003 75Cr1
AISI:	equivalent to 1075 + Chromium
ASTM:	equivalent to G 10780 + Chromium
Engl. Norm:	equivalent to 80 (Norm 5770 Part3)
French. Norm:	XC75 + Chromium
Japanese Norm:	-

3. Alloy Composition *

C:	0,70-0,80%
Si:	0,25-0,50%
Mn:	0,60-0,80%
P:	max. 0,03%
S:	max. 0,03%
Cr:	0,30-0,40%

* the exact composition of each batch can be documented by a material certificate 2.2 or 3.1 according to DIN EN 10 204.

4. Delivery condition

Condition:	hardened and tempered
Surface:	not polished
	Ra 0,30 – 0,60 µm
Flatness:	max. 0,20% of the strip width
Hardness:	48-50 HRC

Further mechanical data: see chapter 7 and 8.

5. Sizes

thicknesses:	0,60-5,03 mm
Standard sizes:	350x1000mm and 610x1220, in some special thicknesses differing

edges: sizes (see table below)
cut (in the non-hardened condition)

The following sizes are available from stock (without obligation):

<i>thickness in mm</i>	<i>maximum width in mm</i>	<i>Hardness in HRC</i>	<i>Annotation</i>
Bis 0,50	305,0 Coil		Im Alloy 1.1274 lieferbar
0,60	610x1220	48-50	
0,70	610x1220	48-50	
0,80	610x1220	48-50	
0,90	610x1220	48-50	
1,00	350x1000 + 610x1220	48-50	
1,50	350x1000 + 610x1220	48-50	
1,80	350x1000	48-50	will be replaced by 1.1274
2,00	350x1000 + 610x1220	48-50	
2,20	ca. 360x900	48-50	small quantity on stock
2,40	ca. 610x1220	48-50	small quantity on stock
2,50	350x1000	48-50	
2,60	ca. 360x1080	48-50	small quantity on stock
2,80	ca. 320x1240	48-50	small quantity on stock
3,00	350x1000 + 610x1220	48-50	
3,20	ca. 317x1240	48-50	small quantity on stock
3,50	350x1000	48-50	
3,80	ca. 420x1230	48-50	small quantity on stock
4,00	350x1000	48-50	
4,54	ca. 620x1240	48-50	small quantity on stock
5,03	350x1000	48-50	

without obligation, Issue: July 2023

6. Tolerances:

thickness tolerance: usually +/- 0,03mm

width tolerance: B2

straightness: normal

7. Further mechanical data

Yield strength Rp0,2 : ca. 90 % of the ultimate tensile strength

Elongation A80: no values available

The highest application temperature is around 200° Celsius, depending on the load.
Please note that Young's modulus values drop as temperature increases.

For higher operation temperatures we suggest the stainless hardened steels like the alloys 1.4031Mo (up to 0.80 mm thickness) and 1.4034 (from 1.0 to approx. 10.0 mm thickness)

8. Physical properties (for alloy 1.1248 = C75S)

Density: 7,9 g/cm³

Thermal conductivity: 49 W/(m °C) at 20 °C

Spec. heat capacity: 460 J/(kg °C) mean value at 50 – 100 °C

Thermal expansion: 10,5 x 10⁻⁶ (between 30 - 100 °C)

11,5 x 10⁻⁶ (between 30 - 200 °C)

Electric resistance: $12,5 \times 10^{-6}$ (between 30 - 300 °C)
approx. 0,20 Ohm x mm²/m (for 1.1231= C67S hardened)

Modus of elasticity: 210 000 MPa at 20 °C
Relative permeability μ : maximum 400 (for 1.1231= C67S hardened)

The given values can be used as indication for the alloy 1.2003 (75Cr1).

9. Blanking

This material should not be blanked due to the high hardness and thickness.
We suggest to produce pieces by laser cutting or water jet cutting.

10. Laser cutting

As the material melts at the edge during laser cutting, a higher hardness and therefore a lower toughness at the cutting zone is possible.

We suggest to produce critical pieces by water jet cutting.

11. Photo etching

Due to the thickness of more than 0,60 mm it is not economical to produce parts by photo etching.

12. Bending

As this material is supplied in the hardened and tempered condition, the rolling direction is not important regarding the bending.

Bending radius: minimum 10 times of the strip thickness.

Spring back angle: As the spring back angle depends on several factors, bending tests are necessary. As guidance an angle of 10° at a strip thickness of 0.20 mm and an angle of 20° at a strip thickness of 0.60 mm can be expected.

13. Flat grinding

The alloy 1.2003 is magnetisable and can be fixed by magnetic clamping devices of flat grinding machines.

14. Welding

Due to the high content of carbon the alloy 1.2003 should not be welded.

15. Korrosionsbeständigkeit

The alloy 1.2003 is not corrosion resistant. We supply this alloy with a light oil film.
If used at normal conditions this alloy needs to be painted or galvanized.

Important Annotation

The specifications which are given in this technical information sheet about the condition and application of the alloys are only for reference and are no confirmation about certain performances and characteristics.

The information correspond to our own experiences and experiences of our suppliers.
We can not guarantee for the results during processing and utilisation.