

Material Data sheet

Issue: July 2023

Unhardened, easily hardenable carbon steel W.-Nr. 1.1248 (C75S)**1. Application examples**

With a carbon content of over 0.75%, this material is very well suited for springs and wear parts that are not subject to corrosion requirements.

In DIN EN 10 132-4, the hardened version of 1.1248 is approved as a material for springs.

If there is a risk of corrosion and the highest demands on the mechanical load, we recommend the material 1.4031Mo, which is available in thicknesses of 0.10 to 0.80 mm.

2. Material codes

German Norm:	1.1248 C75S+QT (former Ck75)
AISI:	1075
ASTM:	G 10750
English Norm:	75 (B.S. 5770 Part 1)
Franz. Norm:	XC 75
Japanese Norm:	C75 C CSP (Norm G 4802)

3. Alloy Composition *

C:	0,70-0,80 %
Si:	0,15-0,30%
Mn:	0,30-0,45%
P:	max. 0,02%
S:	max. 0,02%
Cr:	ca. 0,01%

* 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:	cold rolled, non-hardened (ferritic condition)
Surface:	MA, please ask for roughness values
flatness:	no data available
Ultimate tensile strength:	490-790 N/mm ²

In the thicknesses 4,0+5,0mm, our material on stock is hot-rolled and sandblasted.

Further mechanical data: see chapter 7 and 8.

5. Sizes

thicknesses:	0,20-5,00 mm
raw material width:	ca. 300-330 mm (see table)

edges: cut

Lengths: only available in a length of 1000mm

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

<i>thickness in mm</i>	<i>maximum width in mm</i>	<i>Annotation</i>
0,20mm	ca. 300x1000mm	
0,25mm	ca. 300x1000mm	
0,30mm	ca. 300x1000mm	
0,40mm	ca. 300x1000mm	
0,50mm	ca. 300x1000mm	
0,60mm	ca. 300x1000mm	
0,70mm	ca. 300x1000mm	
0,80mm	ca. 300x1000mm	
1,00mm	ca. 300x1000mm	
1,50mm	ca. 300x1000mm	
2,00mm	ca. 300x1000mm	
2,50mm	ca. 300x1000mm	
3,00mm	ca. 300x1000mm	
4,00mm	ca. 330x1000mm	hot-rolled and sandblasted
5,00mm	ca. 330x1000mm	hot-rolled and sandblasted

Issue: July 2023 (without obligation)

6. Tolerances

thickness tolerance: DIN EN 10 140 and DIN EN 10 051

width tolerance: -

straightness: normal

7. Further mechanical data

Yield strength Rp0,2: ca. 360-460 N/mm²

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

Density: 7,9 g/cm³

Thermal conductivity: 35-45 W/(m °C) bei 20 °C

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)

12,5 x 10⁻⁶ (between 30 - 300 °C)

Electric resistance: ca. 0,20 Ohm x mm²/m (for 1.1231= C67S hardened)

Modus of elasticity: 210 000 MPa at 20 °C

Relative permeability μ_r : ca. 400 (for 1.1231= C67S hardened)

9. Blanking

The alloy 1.1248 can be stamped and drawn easily in the non hardened condition. We recommend a punch-to-die clearance of 4-10 % of the strip thickness. The corner radius should be at least 0.25 mm and the punching die should be at least twice the strip thickness. The pieces should then be tumbled to receive a good edge roundness.

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

This alloy is very easy to etch.

12. Bending

As this material need to be hardened after forming, 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 1.1248 is magnetisable and can be fixed by magnetic clamping devices of flat grinding machines.

14. Welding

Due to a high content of carbon of ca. 0,75% the alloy 1.1248 should not be welded.

15. Corrosion resistance

The alloy 1.1248 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.