

## Material-information-sheet

**Material-number** 1.8161

**Material:** 58 Cr V4

**Steel-group:** Alloyed high grade structure steel, Cr-Si-V-, Cr-Mn-V- und Cr-Si-Mn-V-steel

**Usage:** Heat treatable steel::  
Highly wear-resistant parts of larger dimensions in vehicle- and utility engineering, such as drive shafts, pinion shafts, drive pinions, and so on.

Spring steel:  
Highly stressed spiral, screw and torsion bar springs of large diameter and disc springs, spring washers, and so on (Mounting Strength by 1370-1720 MPa).

Surface hardening steel  
Hexagon – offset screwdriver (Allen® key, torx, and so on) screwdriver blades, hand chisels, large gear shafts, larger gears, drill bits of boring machines, pinions and similar larger parts which require higher core strength.

## Chemical-composition:

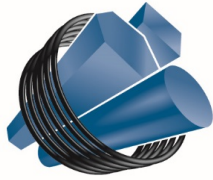
|         | C    | Si   | Mn   | P     | S     | Cr   | V    |
|---------|------|------|------|-------|-------|------|------|
| Minimum | 0,55 | 0,15 | 0,70 | 0,00  | 0,00  | 0,90 | 0,10 |
| Maximum | 0,62 | 0,40 | 1,10 | 0,035 | 0,035 | 1,20 | 0,20 |

## Heat-treatment

|                              | Soft-annealing<br>(+A) | Normal glow  | Hardening<br>in oil | Tempering    |
|------------------------------|------------------------|--------------|---------------------|--------------|
| Hot-forming<br>850 - 1050 °C | 680 - 720 °C           | 850 – 880 °C | 820 - 850 °C        | 480 - 650 °C |

## Mechanical-characteristics:

|                                  |                            |
|----------------------------------|----------------------------|
| Treated for shear ability (+S)   | $R_m \sim 860 \text{ MPa}$ |
| Hardness after hot-forming       | $R_m \leq 840 \text{ MPa}$ |
| Surface hardness after hardening | $\sim 60 - 65 \text{ HRC}$ |



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## In the tempered state:

| Diameter [mm]                    | ≤ 16      | > 16 - 40 | > 40 - 100 | > 100 - 160 | > 160 - 250 |
|----------------------------------|-----------|-----------|------------|-------------|-------------|
| Elastic limit $R_{p0,2}$ [MPa]   | ≥ 1100    | ≥ 1000    | ≥ 900      | ≥ 750       | ≥ 750       |
| Tensile Strength $R_m$ [MPa]     | 1350-1600 | 1200-1400 | 1100-1300  | 1000-1200   | 1000-1200   |
| Elongation at fracture $A_s$ [%] | > 7       | > 8       | > 10       | > 12        | > 12        |
| Contraction at fracture $Z$ [%]  | > 40      | > 45      | > 50       | > 55        | > 55        |
| Energy of impact ISO-V [J]       | > 13      | > 13      | > 13       | > 13        | > 13        |

## **Stock:**

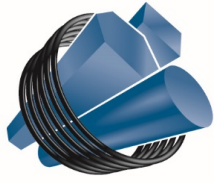
### Bars

- Bar length 3 – 4 m
- Tolerance-data: EN 10278
- Technical delivery conditions EN 10277, surface quality class 2

| Achievement | Cross-section-design (data in mm) |      |         |         |                 |
|-------------|-----------------------------------|------|---------|---------|-----------------|
|             | round                             | 4-kt | 6-kt    | 8-kt    | flat oval       |
| Tolerance   | h9                                | h11  | h11     | h11     |                 |
| +AC+C+A+C   | 3 – 8                             |      | 2 -7,14 |         |                 |
| +AC+C       | 4,5 – 40                          |      | 5 -36   | 10 – 22 |                 |
| +A+CR+A+CR  |                                   | 8 +9 |         |         | X <sup>1)</sup> |
| +AC+SH      | 27 - 44                           |      |         |         |                 |
|             |                                   |      |         |         |                 |

<sup>1)</sup>: following dimension:

- 17 x 11 mm
- 20 x 12 mm
- 23 x 13 mm
- 26 x 7 mm
- 26 x 13 mm
- 28 x 7 mm



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## Coils:

- Coil weight 100 – 400 kg
- Tolerance-data: EN 10278
- Technical delivery conditions: EN 10277, surface quality class 2

| Achievement | Cross-section-design (data in mm) |      |          |  |  |
|-------------|-----------------------------------|------|----------|--|--|
|             | round                             | 4-kt | 6-kt     |  |  |
| +AC+C+A+C   | 2,2 - 8                           |      | 1,19 - 8 |  |  |
|             |                                   |      |          |  |  |