

16MnCrS5

All

General Information

16MnCrS5 is a grade with improved machinability. It is recommended for applications with high demands on mechanical properties, machinability and surface quality. It is also suitable for case hardening and has good weldability.

M-Steel®

The basis for the concept is that non-metallic inclusions are modified and controlled with calcium treatment in a way to minimize tool wear and to maximize chip control in machining operations. Our M-Steel treatment can be applied to any steel grade.

Similar designations

18MnCr5-4 (EN10027), 16MnCr5, 1.7139, 1.7131, SB9218

Chemical composition

| Variant      | Cast | Di   | Weldability             |     | C %  | Si % | Mn % | P %   | S %   | Cr % | Cu % | Al %  |
|--------------|------|------|-------------------------|-----|------|------|------|-------|-------|------|------|-------|
| 4306         | CC   | 1.85 | CEV 0.59 <sub>max</sub> | Min | 0.14 | 0.10 | 1.00 | -     | 0.020 | 0.80 | -    | 0.005 |
|              |      |      | Pcm 0.29 <sub>max</sub> | Max | 0.18 | 0.40 | 1.35 | 0.025 | 0.040 | 1.10 | 0.35 | 0.050 |
| 4316         | CC   | 1.85 | CEV 0.59 <sub>max</sub> | Min | 0.14 | 0.15 | 1.10 | -     | 0.025 | 0.90 | -    | 0.015 |
|              |      |      | Pcm 0.29 <sub>max</sub> | Max | 0.18 | 0.40 | 1.35 | 0.035 | 0.040 | 1.10 | 0.35 | 0.050 |
| SB16MnCrS5   | CC   |      | CEV 0.58 <sub>max</sub> | Min | 0.16 | 0.15 | 1.15 | -     | 0.025 | 0.90 | -    | 0.015 |
|              |      |      | Pcm 0.3 <sub>max</sub>  | Max | 0.19 | 0.35 | 1.30 | 0.035 | 0.040 | 1.10 | 0.35 | 0.050 |
| EN ISO 683-3 | Std  |      | CEV <sub>max</sub>      | Min | 0.14 | 0.15 | 1.00 | -     | 0.020 | 0.80 | -    | -     |
|              |      |      | Pcm <sub>max</sub>      | Max | 0.19 | 0.40 | 1.30 | 0.025 | 0.040 | 1.10 | 0.40 | -     |

Mechanical Properties

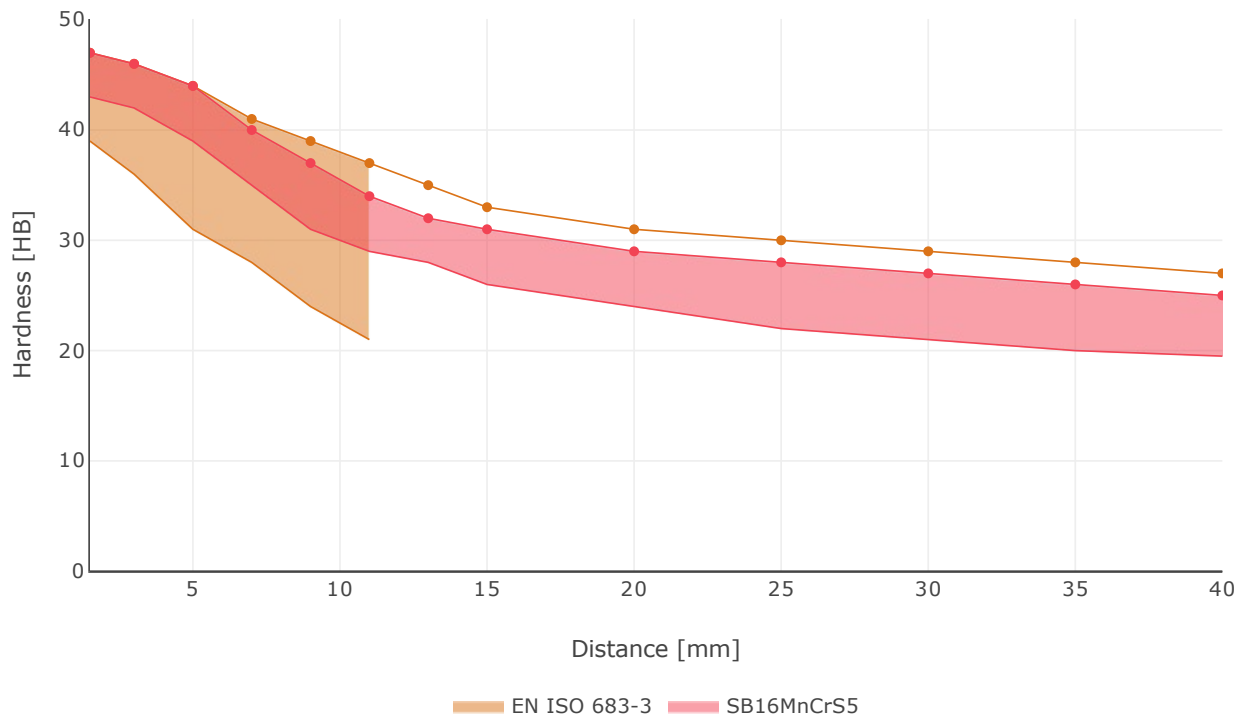
| Variant    | <div><div></div>Condition</div> | Format    | Dimension [mm] | Yield strength min [MPa] | Tensile strength [MPa] | Elongation A <sub>5</sub> [%] | Hardness |
|------------|---------------------------------|-----------|----------------|--------------------------|------------------------|-------------------------------|----------|
| 4306       | +AR                             |           | 25 < 160       | -                        | -                      | -                             | < 230 HB |
|            | +A                              | Round bar | 25 < 160       | -                        | -                      | -                             | < 150 HB |
| 4316       | +AR                             |           | 25 < 160       | -                        | -                      | -                             | < 230 HB |
|            | +A                              | Round bar | 25 < 160       | -                        | -                      | -                             | < 150 HB |
| SB16MnCrS5 | +AR                             | Flat bar  | < 100          | 350**                    | 560-720                | 15                            | < 225 HB |

*RP<sub>0.2</sub> \* R<sub>eh</sub>, \*\* R<sub>el</sub>*

Transformation temperatures

|     | Temperature °C |
|-----|----------------|
| MS  | 418            |
| AC1 | 738            |
| AC3 | 822            |

## Hardenability



EN ISO 683-3 data for +H band

## SUSTAINABILITY-ENVIRONMENTAL IMPACT DATA

At Ovako sustainability and reduction of our environmental impact is a major focus in everything we do.

Further information is found [here](#).

| Steel works          | Hofors | Smedjebacken | Imatra |
|----------------------|--------|--------------|--------|
| CO <sub>2</sub> e/kg | 120    | 62           | 76     |

To get the full picture of our products environmental impact we have to look at all of our CO<sub>2</sub> emission sources.

Not only the steel work Scope 1-2 itself, but all operations downstream in our production, heating and heat treatment furnaces etc (full scope 1-2) as well as all the emission from input material, eg. alloys, scope 3.

| Steel Grade   | Format    | Condition ⓘ | Scope 1-3 (CO <sub>2</sub> e kg /1000 kg steel) | Climate compensated Net emission = Scope 3 (CO <sub>2</sub> e kg /1000 kg steel) Scope 1 - 2 = 0 (compensated) |
|---------------|-----------|-------------|---|--|
| SB16MnCrS5(M) | Round bar | +AR         | 427   | 197  |

All above data are to be seen as typical values for the specified format and condition. Detailed information about your specific product please contact your sales contact.

## Other properties (typical values)

| Youngs module (GPa)           | Poisson´s ratio (-)                       | Shear module (GPa)                               | Density (kg/m <sup>3</sup> )                     |
|-------------------------------|---|--|--|
| 210                           | 0.3                                       | 80   | 7800   |
| Average CTE 20-300°C (µm/m°K) | Specific heat capacity 50/100°C (J/kg °K) | Thermal conductivity Ambient temperature (W/m°K) | Electrical resistivity Ambient temperature (µΩm) |
| 12                            | 460 - 480                                 | 40 - 45  | 0.20 - 0.25                                      |

## Contact us

Would you like to know more about our offers? Don´t hesitate to contact us:

Via e-mail: [info@ovako.com](mailto:info@ovako.com)

Via telephone: +46 8 622 1300

For more detailed information please visit <http://www.ovako.com/en/Contact-Ovako/>

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