

## 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

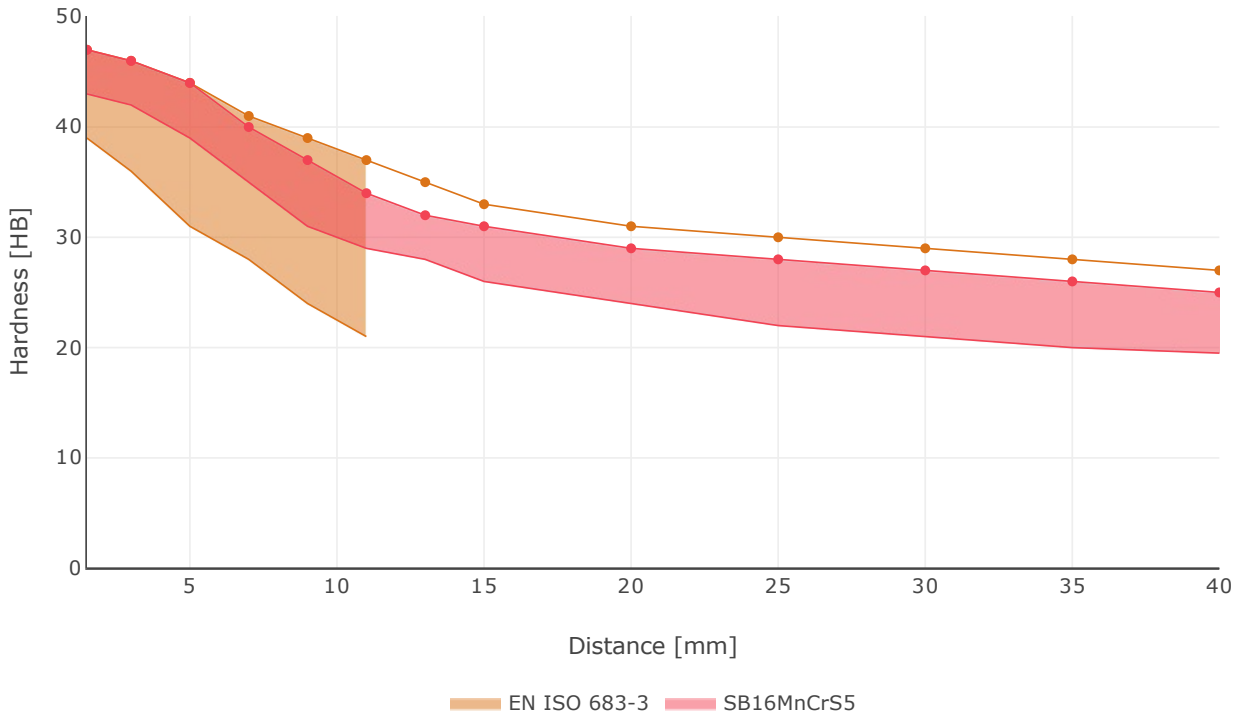
Variant	Condition	Format	Dimension [mm]	Yield strength min [MPa]	Tensile strength [MPa]	Elongation A <sub>5</sub> [%]	Hardness
4306	+AR		25 < 160	-	-	-	< 230 HB
	+A	Round bar	25 < 160	-	-	-	< 150 HB
4316	+AR		25 < 160	-	-	-	< 230 HB
	+A	Round bar	25 < 160	-	-	-	< 150 HB
SB16MnCrS5	+AR	Flat bar	< 100	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](#).

In many international comparisons the crude steel Scope 1-2 emission is a key parameter, ie. the CO<sub>2</sub> emission from the steel works itself.

As of 1 January 2022 we carbon offset all our scope 1 and 2 volume shown below.

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

As of 1 January 2022 we use carbon offset for all our scope 1- 2 emissions, so in practice the climate compensated data is the same as the full Scope 3 level.

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/m3)
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:

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Via telephone: +46 8 622 1300

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

## Disclaimer

*The information in this document is for illustrative purposes only. The data and examples are only general recommendations and not a warranty or a guarantee. The suitability of a product for a specific application can be confirmed only by Ovako once given the actual conditions. The purchaser of an Ovako product has the responsibility to ascertain and control the applicability of the products before using them. Continuous development may necessitate changes in technical data without notice. This document is only valid for Ovako material. Other material, covering the same international specifications, does not necessarily comply with the properties presented in this document.*