

## STEEL GRADE

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33MnCrB5-2 All

## General Information

## WR-Steel®

(Wear resistant ) WR-steel, stands for wear-resistant steel. This group of steel includes a broad range of grades with a wide range of hardness levels 350 – 650 HV, dimensions and steel grades designed to give you a wear-resistant advantage when making product exposed to a high degree of wear and where service life is important. WR-steels are characterised by consistent properties and cost effectiveness due to optimized alloy content for different end applications.

## Similar designations

15B35H

## Chemical composition

Variant	Cast		C %	Si %	Mn %	P %	S %	Cr %	B %
30MnCrB5* / SB9661	CC	Min	0.27	0.15	1.20	-	-	0.40	0.0015
		Max	0.32	0.35	1.40	0.035	0.035	0.60	0.0040
33M13CB / SB9669	CC	Min	0.30	0.15	1.20	-	-	0.40	0.0020
		Max	0.36	0.35	1.40	0.035	0.035	0.60	0.0050
33MnCrB5-2(EN ISO 683-2)	Std	Min	0.30	-	1.20	-	-	0.30	0.0008
		Max	0.36	0.40	1.50	0.025	0.035	0.60	0.0050

## Transformation temperatures

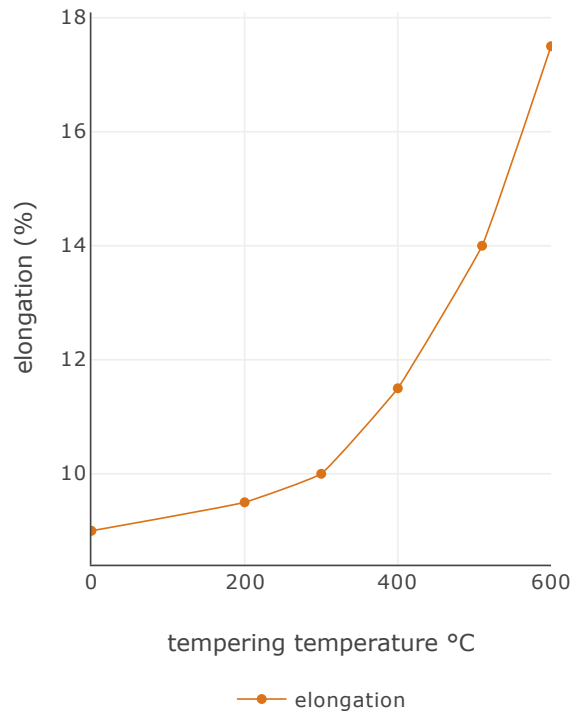
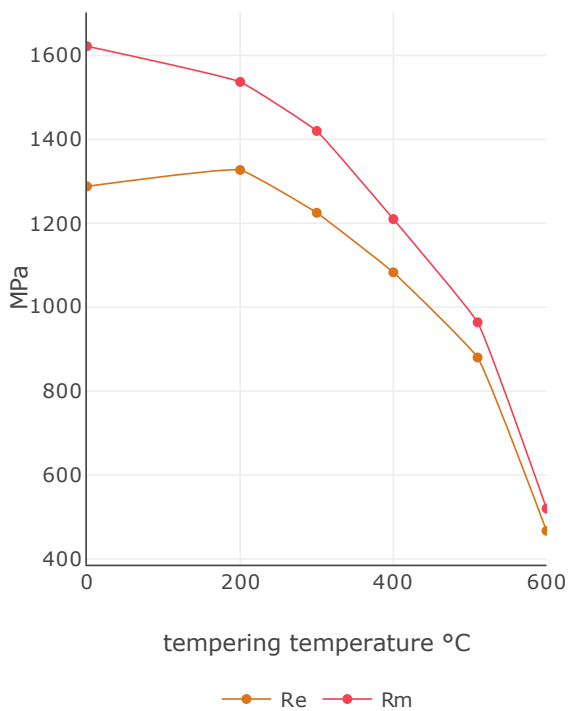
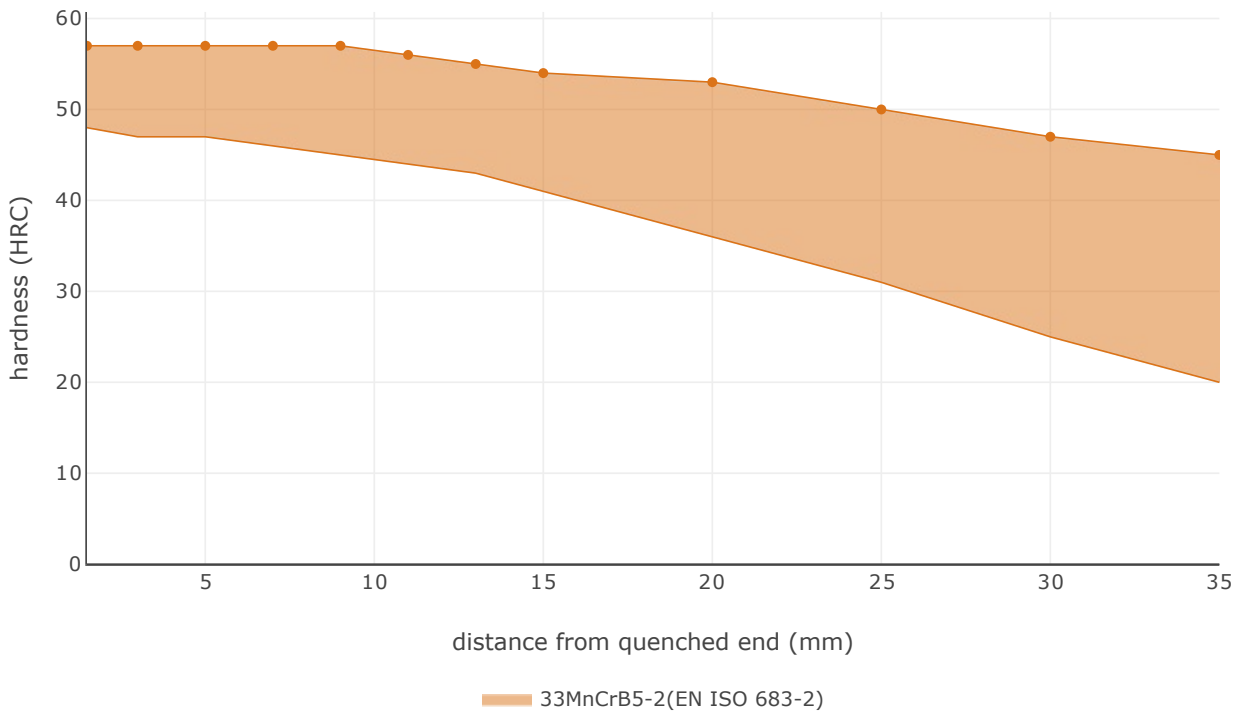
	Temperature °C
MS	368
AC1	720
AC3	781

## Heat treatment recommendations

Treatment	Condition ⓘ	Temperature cycle	Cooling/quenching
Quench & Tempering	+QT	Heating to 880 - 900	water or in oil

A tempering is recommended after quenching. For maximum hardness the tempering should be 200 °C, for increased toughness the tempering temperature should be higher.

## Hardenability



## 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 <sup>①</sup>	Scope 1-3 (CO2e kg /1000 kg steel)	Climate compensated Net emission = Scope 3 (CO2e kg /1000 kg steel) Scope 1 - 2 = 0 (compensated)
SB28M13CB/9667	Flat bar	+AR	408	186

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

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