

# STEEL GRADE

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## 19MnVS6 All

### General Information

19MnVS6 according to EN10267 may with its generous chemical analysis and moderate mechanical requirements host a number of grades. It does at Ovako's! All variants are microalloyed with vanadium which gives a fine grain size and a good start for excellent toughness. The most frequent usage is as rolled, but all members in the family may be heat-treated in different ways. A heat-treatment will naturally affect the mechanical properties.

The Ovako program starts with a yield strength of minimum 400 MPa and finishes at minimum 520 MPa where each variant is carefully balanced to give the desired properties without a wasteful addition of alloying elements. Weldability goes from excellent to good with increasing alloying content and yield strength.

19MnVS6 is also available as M-steel.

### 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

SB280 - 18Mn6, E470, SS2134, 1.5217, 19MnV6

### Chemical composition

Variant	Cast	DI	Weldability		C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	V %	Cu %	Al %	N %
SB280 / 9838	CC		CEV 0.45 <sub>max</sub>	Min	0.16	0.20	1.30	-	0.020	-	-	-	0.060	-	-	-
			Pcm 0.28 <sub>max</sub>	Max	0.20	0.50	1.60	0.035	0.040	-	-	-	0.110	-	-	-
SB280X / 9858	CC		CEV 0.58 <sub>max</sub>	Min	0.16	0.20	1.40	-	-	-	-	-	0.080	-	0.008	-
			Pcm 0.32 <sub>max</sub>	Max	0.20	0.50	1.75	0.025	0.040	0.30	0.30	0.10	0.130	0.35	0.040	-
SB280XM / 9875	CC		CEV 0.55 <sub>max</sub>	Min	0.15	0.25	1.40	-	0.020	-	-	-	0.080	-	0.017	-
			Pcm 0.3 <sub>max</sub>	Max	0.19	0.45	1.75	0.035	0.040	0.30	0.30	-	0.120	0.35	0.030	-
SB450	CC		CEV 0.31 <sub>max</sub>	Min	-	0.15	0.80	-	-	-	-	-	-	-	-	-
			Pcm 0.18 <sub>max</sub>	Max	0.20	0.50	1.60	0.035	0.035	-	-	-	-	-	-	-
SB500	CC		CEV 0.56 <sub>max</sub>	Min	-	0.15	1.25	-	-	-	-	-	-	-	-	-
			Pcm 0.33 <sub>max</sub>	Max	0.20	0.50	1.60	0.035	0.035	0.30	0.25	-	0.150	-	-	-
7255	CC	1.5	CEV 0.45 <sub>max</sub>	Min	0.16	0.20	1.30	-	0.020	-	-	-	0.060	-	0.011	-
			Pcm 0.28 <sub>max</sub>	Max	0.20	0.50	1.60	0.020	0.040	-	-	-	0.110	-	0.060	-
7256	CC	1.6	CEV 0.5 <sub>max</sub>	Min	0.16	0.20	1.40	-	0.020	-	-	-	0.080	-	0.011	-
			Pcm 0.3 <sub>max</sub>	Max	0.20	0.50	1.75	0.020	0.040	-	-	-	0.130	-	0.060	-
7265	CC		CEV 0.55 <sub>max</sub>	Min	0.16	0.25	1.30	-	-	-	-	-	0.070	-	-	-
			Pcm <sub>max</sub>	Max	0.22	0.50	1.55	0.025	-	0.50	-	-	0.110	-	-	-
19MnVS6 EN10267:1998 (ref)	Std		CEV 0.5 <sub>max</sub>	Min	0.15	0.15	1.20	-	0.020	-	-	-	0.080	-	-	0.0100
			Pcm 0.31 <sub>max</sub>	Max	0.22	0.80	1.60	0.025	0.060	0.30	-	0.08	0.200	-	-	0.0200

## Mechanical Properties

Variant	Condition	Format	Dimension [mm]	Yield strength min [MPa]	Tensile strength [MPa]	Elongation A <sub>5</sub> [%]	Reduction of area Z <sub>min</sub> [%]	Hardness	Impact (ISO-V) strength <sub>min</sub>
SB280 / 9838	+AR	Round bar	15 < 70	460**	600-770	19	-	180-230 HB	-20 °C 27 J (long)
		Round bar	70 < 90	440**	550-700	19	-	180-230 HB	-20 °C 27 J (long)
SB280X / 9858	+AR	Flat bar	10 < 60	520**	650-800	19	-	200-250 HB	-20 °C 27 J (long)
		Round bar	25 < 100	520	650-800	19	-	200-250 HB	-20 °C 27 J (long)
SB280XM / 9875	+AR	Round bar	20 < 90	520**	650-800	19	-	200-250 HB	-20 °C 27 J (long)
SB450	+AR	Flat bar	10 < 50	450**	400-695	16	-	-	-
SB500	+AR	Round bar	14 < 25	500*	670-830	19	-	200-250 HB	-
		Round bar	25 < 60	500*	650-750	19	-	190-230 HB	-20 °C 27 J (long)
		Flat bar	6 < 10	500*	630-780	19	-	190-250 HB	-
		Flat bar	10 < 15	500*	630-750	19	-	190-230 HB	-
		Flat bar	15 < 30	500*	630-750	19	-	190-230 HB	-
		Flat bar	30 < 70	470*	610-730	19	-	180-225 HB	-20 °C 27 J (long)
7255	+AR	Round bar	95 < 130	440*	550-700	19	-	< 230 HB	-20 °C 27 J (long)
		Round bar	130 < 160	400*	550-700	19	-	< 230 HB	-20 °C 27 J (long)
7256	+AR	Round bar	45 < 90	520*	650-800	19	-	< 240 HB	-20 °C 27 J (long)
		Round bar	25 < 160	-	-	-	-	< 250 HB	-
7265	+AR	Round bar	25 < 120	450*	550-750	21	55	180-220 HB	0 °C 27 J (long)
		Round bar	121 < 160	410*	550-750	21	55	180-220 HB	0 °C 27 J (long)
19MnVS6 EN10267:1998 (ref)	+AR	All formats	-	390*	600-750	16	32	-	-

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

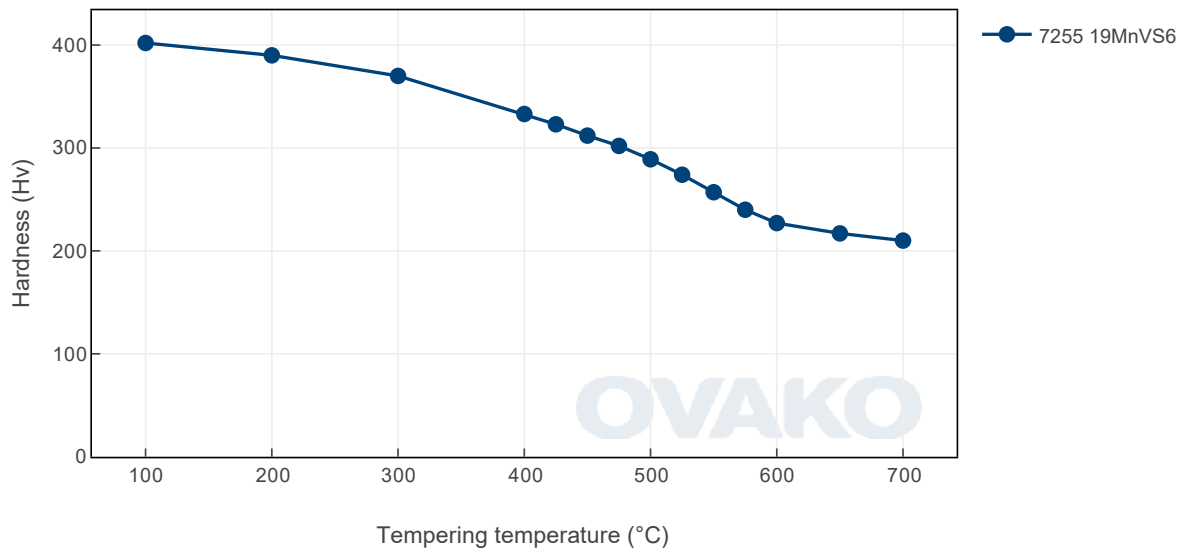
## Transformation temperatures

	Temperature °C
MS	410
AC1	720
AC3	810

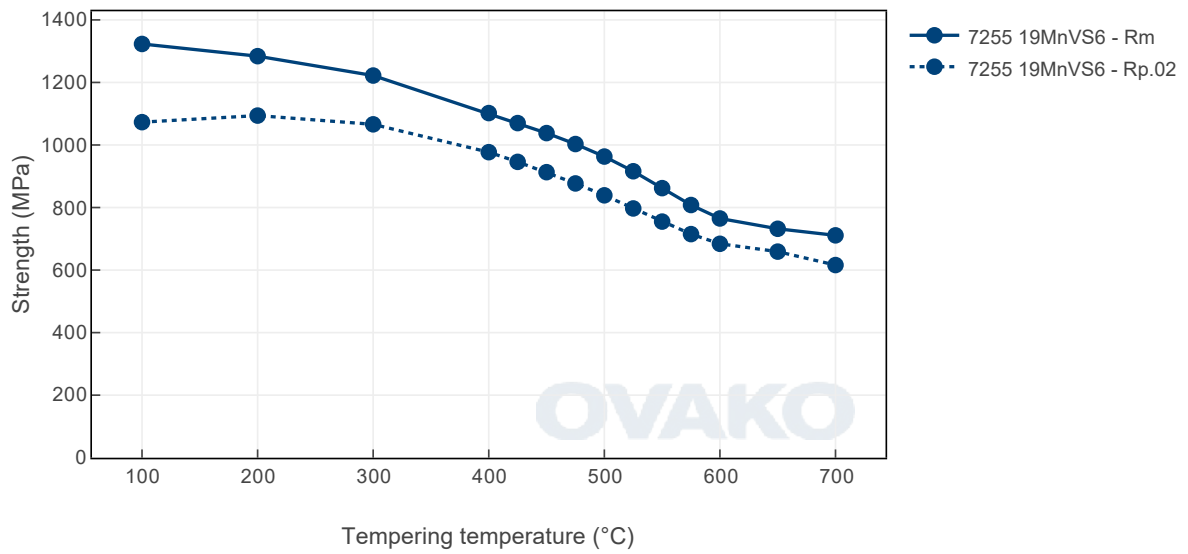
## Heat Treatment Guide generated Graphs

The following graphs are generated from a theoretical model. For further info see the Heat treatment guide module. Select a specific grade version for individual display.

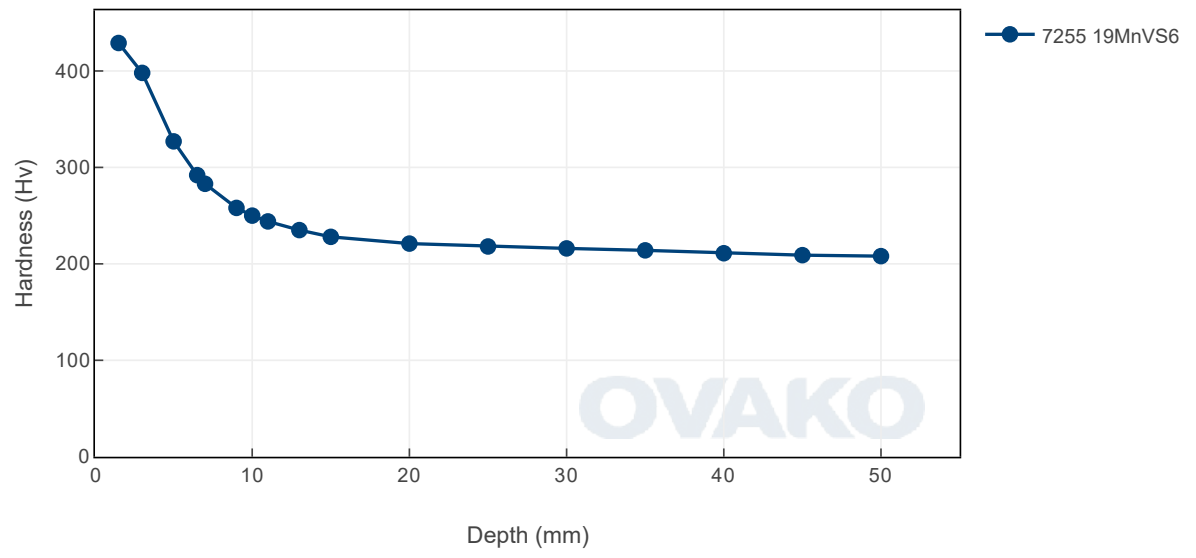
Tempering Diagram (hardness)



Tempering Diagram (strength)



# Jominy





## 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
CO2e/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 (CO2e kg /1000 kg steel)	Climate compensated Net emission = Scope 3 (CO2e kg /1000 kg steel) Scope 1 - 2 = 0 (compensated)
SB500	Flat bar	+AR	416	179
SB280	Round bar	+AR	410	177
SB280X	Flat bar	+AR	411	181
SB450	Round bar	+AR	411	190
SB280XM	Round bar	+AR	429	195
7256	Round bar	+AR	511	220
280 M (7266)	Round bar	+AR	516	225
7255	Flat bar	+AR	513	229

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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