MATERIAL DATA SHEET

STEEL GRADE

Last revised: Thu, 30 Jan 2025 11:07:56 GMT

OVAKO

46MnVS3 All

General Information

46MnVS3 is a micro-alloyed steel suitable for forging where no further heat-treatment is necessary. SB9850 is treated to give excellent machinability. Two available variants are SB9850 and 382K.

** Designation followed by "*" is not an official EN standard grade but named according to the rules in EN 10027.*

Similar designations

SB9850 - S620*, 1.1305

Chemical composition

Variant	Cast	Weldability		C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	V %	Ti %	Cu %	Al %	N %
SB9850	CC	CEV 0.65_{max}	Min	0.42	0.15	0.70	-	0.040	-	-	-	0.070	-	-	-	0.0090
		Pcm 0.55_{max}	Max	0.46	0.40	1.00	0.035	0.060	0.30	-	0.08	0.200	0.010	-	0.030	0.0200
382K	IC	CEV 0.75_{max}	Min	0.42	0.25	0.85	-	0.045	0.15	-	-	0.080	-	-	0.015	0.0090
		Pcm 0.57_{max}	Max	0.46	0.40	1.00	0.035	0.060	0.25	0.30	-	0.100	-	0.25	0.030	0.0140
46MnVS3 EN 10267:1998 (ref)	Std	CEV 0.71_{max}	Min	0.42	0.15	0.60	-	0.020	-	-	-	0.080	-	-	-	0.0100
		Pcm 0.56_{max}	Max	0.49	0.80	1.00	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_5 [%]	Reduction of area Z_{min} [%]	Hardness
SB9850	+AR	Round bar	15 < 23	620**	775-890	18	35	235-270 HB
		Round bar	24 < 30	580**	775-890	16	-	235-270 HB
		Round bar	31 < 50	560**	775-890	16	-	235-270 HB
		Round bar	51 < 90	540**	775-890	16	-	235-270 HB
46MnVS3 EN 10267:1998 (ref)	+AR	All formats	-	450**	700-900	14	30	-

*$Rp_{0.2}$ * R_{eh}, ** R_{el}*

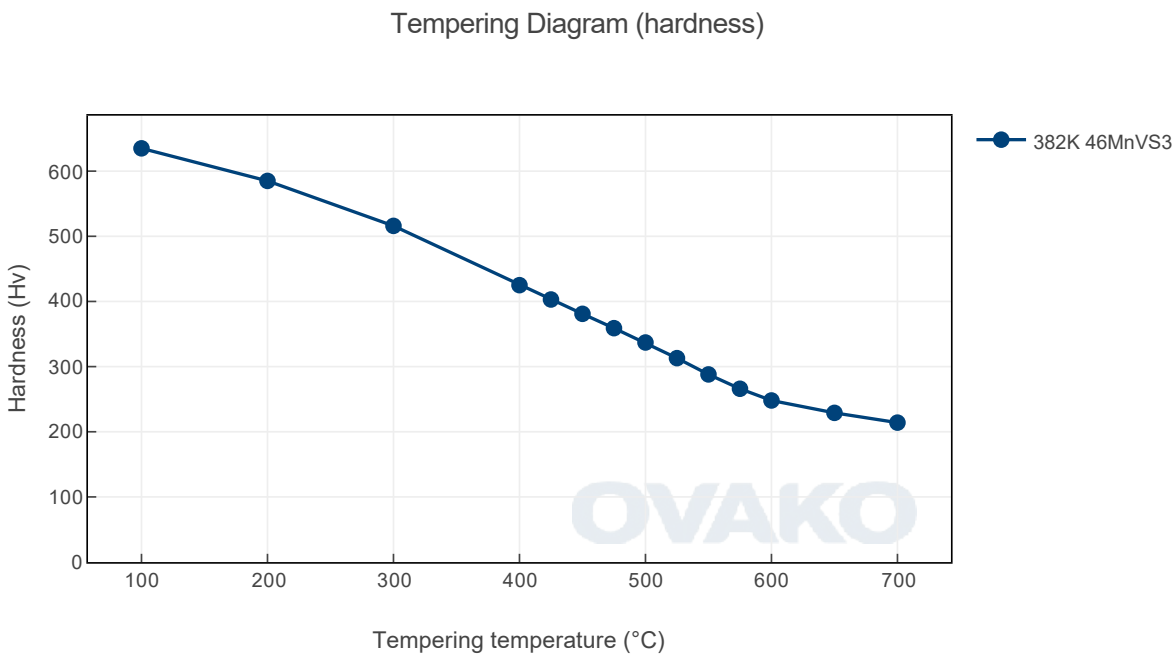
The limits for 46MnVS3 are valid for bars after controlled cooling. Forging will increase yield and tensile strength and decrease elongation and reduction of area.

Transformation temperatures

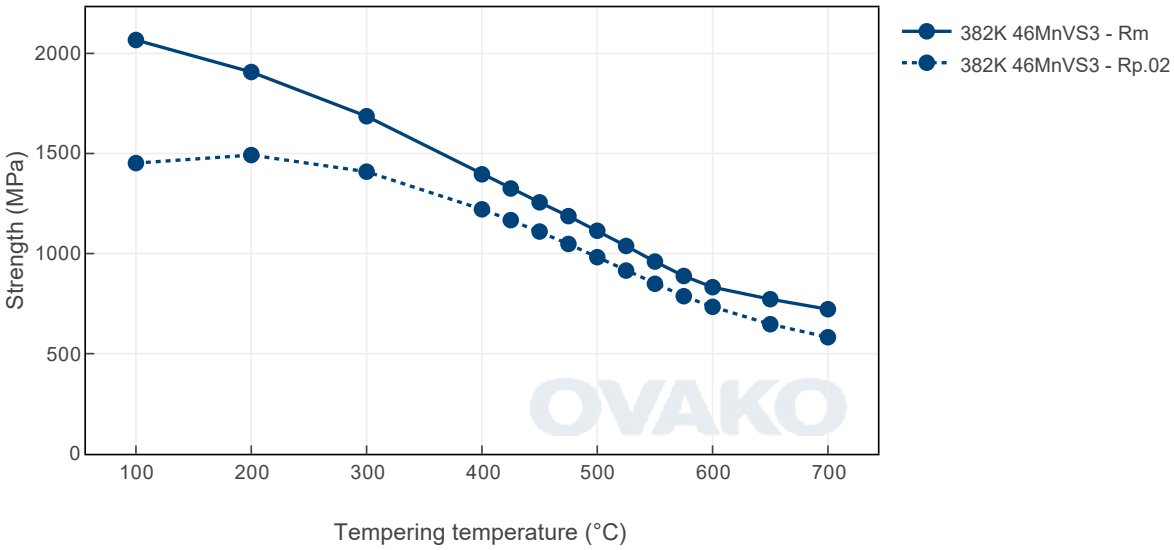
	Temperature °C
MS	314
AC1	733
AC3	794

Heat Treatment Guide generated Graphs

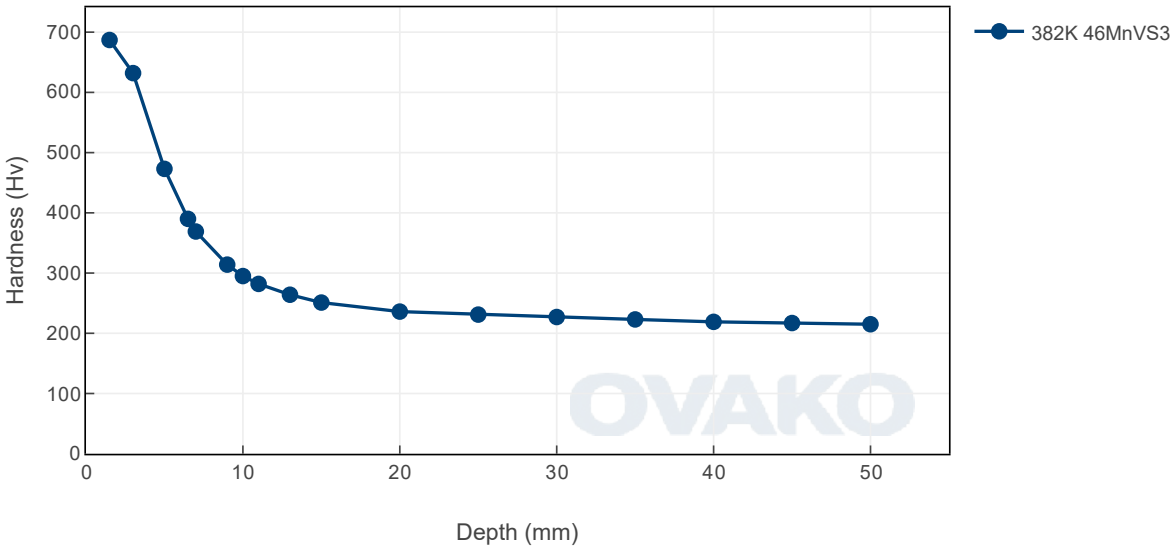
The following graphs are generated from a theoretical model. For further info see the Heat treatment guide module. Select a specific grade version for individual display.



Tempering Diagram (strength)



Jominy


Hardness (Hv)
700
600
500
400
300
200
100
0
0
10
20
30
40
50
Depth (mm)
382K 46MnVS3
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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_2 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)
382K	Round bar	+AR	577	178
382K	Round bar	+N	582	181
382K	Tube,wall	+AR	597	199
382K	Tube,wall	+N	599	202
SB9850	Flat bar	+AR	501	226

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