Material data sheet
Steel grade

Last revised: Thu, 23 Feb 2023 16:20:02 GMT

OVAKO

52CrMoV4 All

General Information

52CrMoV4 is a springsteel suitable for quenching and tempering, used in e.g. leaf springs and other vehicle springs.

Similar designations

SB9296 - 54CrMnMo4-4, 51CrMoV4

Chemical composition

Variant	Cast	Di	Weldability		C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	V %	Ti %	Cu %
SB9296	CC	8.4	CEV 1.01_{max}	Min	0.51	0.25	0.94	-	-	1.02	-	0.15	0.100	-	-
			Pcm 0.7_{max}	Max	0.56	0.40	1.10	0.015	0.015	1.12	0.20	0.20	0.120	0.040	0.21
52CrMoV4 EN10089:2002	Std		CEV $_{max}$	Min	0.48	-	0.70	0.000	0.000	0.90	-	0.15	0.100	-	-
			Pcm $_{max}$	Max	0.56	0.40	1.10	0.025	0.025	1.20	-	0.30	0.200	-	-

Mechanical Properties

Variant	Condition	Format	Dimension [mm]	Yield strength min [MPa]	Tensile strength [MPa]	Elongation A_5 [%]	Reduction of area Z_{min} [%]	Hardness	Impact (ISO-V) $strength_{min}$
SB9296	+AR	All formats	-	-	-	-	-	< 440 HB	-
		Flat bar	9 < 30	-	-	-	-	381 HB typical	-
		Flat bar	30 < 56	-	-	-	-	345 HB typical	-
		Round bar	30 < 50	-	-	-	-	353 HB typical	-
		Round bar	50 < 95	-	-	-	-	346 HB typical	-
52CrMoV4 EN10089:2002	+S	All formats	-	-	-	-	-	< 280 HB	-
	+A	All formats	-	-	-	-	-	< 248 HB	-
	+AC	All formats	-	-	-	-	-	< 230 HB	-
	+QT	All formats	-	1300	1450-1750	6	35	-	20 °C 10 J (long)

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

Impact test is made with U-notched pieces in +QT.

Reference treatment for 52CrMoV4 EN10089:2002 is quench from 860 ℃ followed by tempering at 450 ℃.

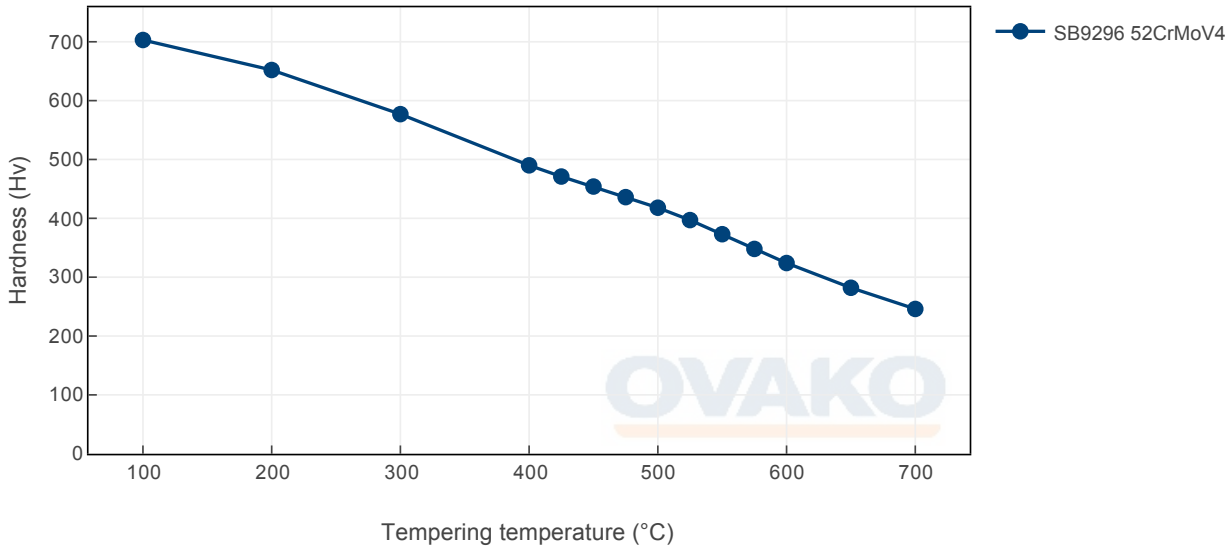
Transformation temperatures

	Temperature °C
MS	265
AC1	737
AC3	776

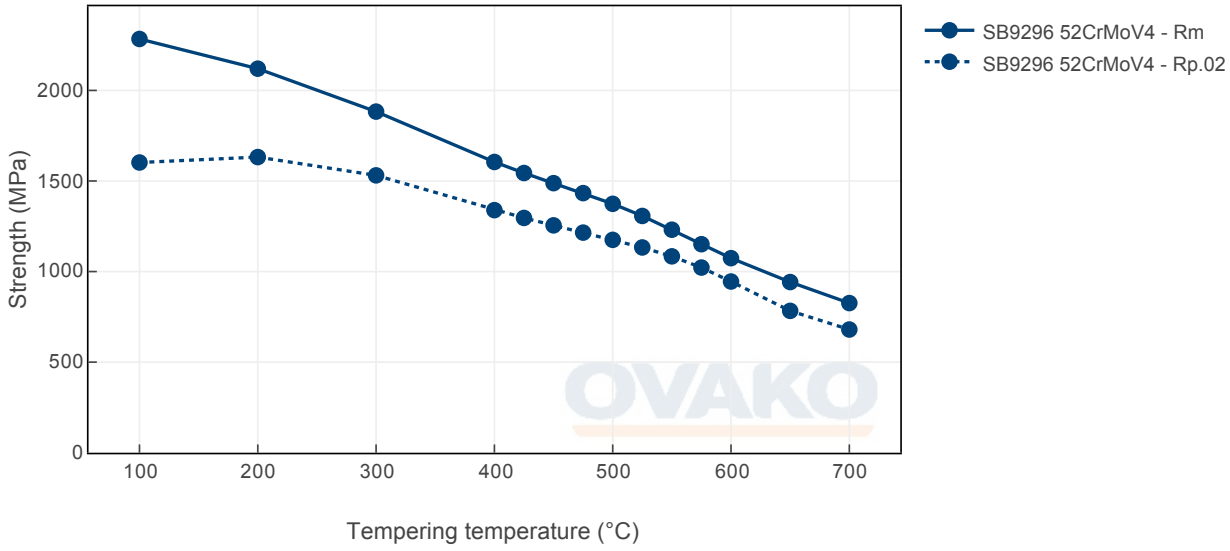
Heat Treatment Guide generated Graphs

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.

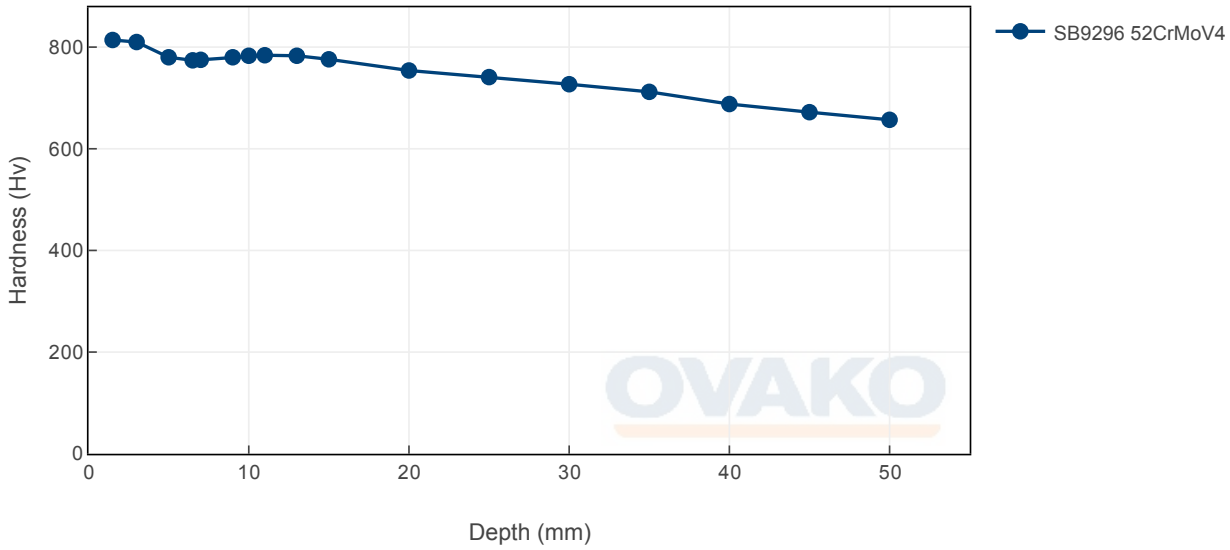
Tempering Diagram (hardness)



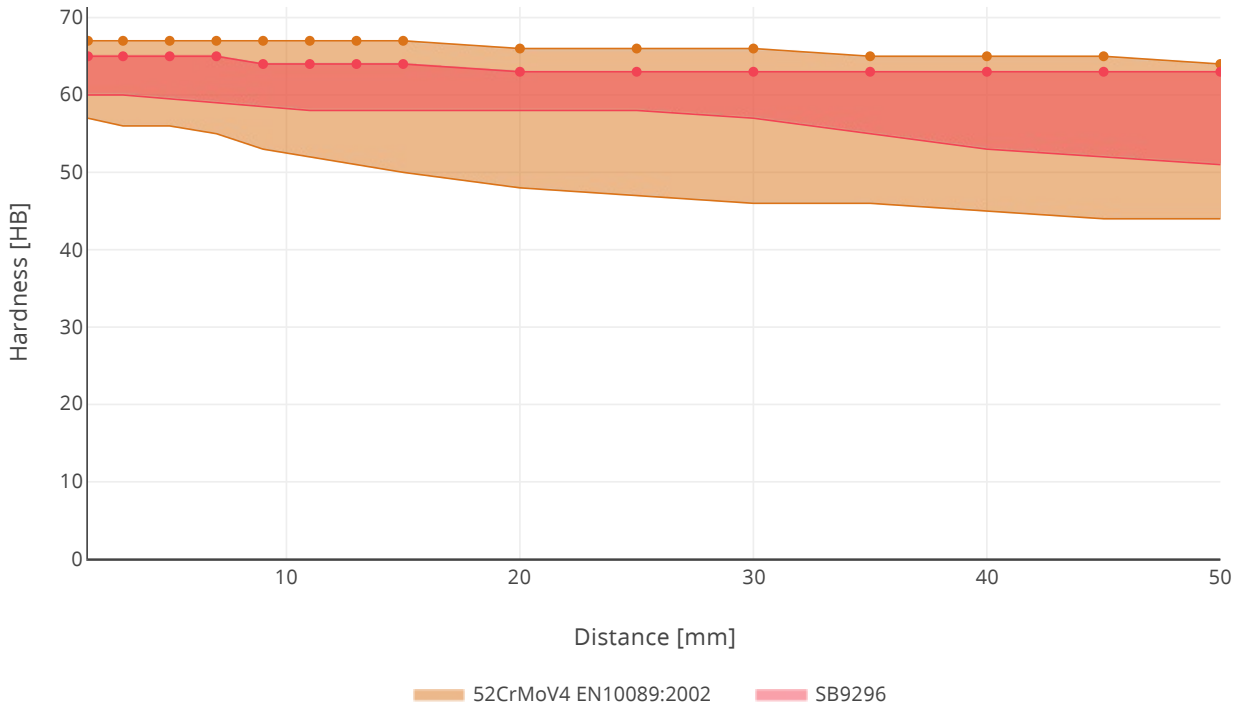
Tempering Diagram (strength)



Jominy


Hardness (Hv)
800
600
400
200
0
0
10
20
30
40
50
Depth (mm)
SB9296 52CrMoV4

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.

In many international comparisons the crude steel Scope 1-2 emission is a key parameter, ie. the CO_2 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
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)
SB9296	Flat bar	+AR	412	213

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 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:

Via e-mail: info@ovako.com

Via telephone: +46 8 622 1300

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