

S355J2 All

General Information

S355J2 is a micro alloyed structural steel suitable for e.g. mechanical engineering applications. The steel possess a good weldability with max CEV =0.47 for all variants. The steel may be delivered with a controlled silicon content for good galvanizing properties. Below, a number of closely related variants with various impact strength are presented.

Variant SB9813 is delivered with a closely controlled C-content for predictable properties and with a CEV value of max 0.41.

Variant S355J2(M) is a M-treated variant

Variant S355K2 and S355L4 both show good Impact toughness

Variant 285K is a variant of 520M

Variant 520M is a M-steel variant of S355J2

Variant 550M is a drawn or peeled version of S355J2

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

ASt 52, A52 FP, Q420q-D, 1501 Gr.224-460, A52 RBII, 1.0577, St52-3, SB9837 Grade32-36, SB9833

Chemical composition

Variant	Cast	DI	Weldability		C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	V %	Cu %	Al %
SB9813	CC		CEV 0.41 _{max}	Min	0.13	0.15	1.00	-	-	-	-	-	0.030	-	0.025
			Pcm 0.25 _{max}	Max	0.18	0.25	1.30	0.025	0.025	0.15	0.25	0.07	0.120	0.30	-
S355J2(M)	CC		CEV 0.5 _{max}	Min	-	-	-	-	0.020	-	-	-	-	-	-
			Pcm 0.3 _{max}	Max	0.20	0.55	1.60	0.035	0.040	-	-	-	0.150	-	-
S355K2	CC		CEV 0.45 _{max}	Min	-	-	-	-	-	-	-	-	-	-	-
			Pcm 0.3 _{max}	Max	0.20	0.55	1.60	0.030	0.030	-	-	-	-	0.55	-
S355L4	CC		CEV 0.43 _{max}	Min	-	-	-	-	-	-	-	-	-	-	-
			Pcm 0.26 _{max}	Max	0.16	0.55	1.60	0.030	0.030	-	-	-	-	0.40	-
285K	CC		CEV _{max}	Min	0.11	0.15	1.15	-	0.025	-	-	-	0.040	-	-
			Pcm _{max}	Max	0.14	0.55	1.35	0.025	0.045	-	-	-	0.080	0.35	-
520 M (2721, 2723)	CC	0.9	CEV 0.47 _{max}	Min	0.05	0.05	1.00	0.000	0.020	-	-	-	0.030	-	-
			Pcm 0.3 _{max}	Max	0.20	0.50	1.50	0.025	0.040	-	-	-	0.100	0.55	-
550 M (2723)	CC	0.9	CEV 0.47 _{max}	Min	0.05	0.05	1.00	0.000	0.020	-	-	-	0.030	0.00	-
			Pcm 0.3 _{max}	Max	0.20	0.50	1.50	0.025	0.040	-	-	-	0.100	0.55	-
S355J2 EN10025-2:2019	Std		CEV 0.47 _{max}	Min	-	-	-	-	-	-	-	-	-	-	-
			Pcm 0.35 _{max}	Max	0.20	0.55	1.60	0.030	0.030	-	-	-	-	0.55	-

Mechanical Properties

Variant	Condition	Format	Dimension [mm]	Yield strength min [MPa]	Tensile strength [MPa]	Elongation A ₅ [%]	Hardness	Impact (ISO-V) strength _{min}
SB9813	+AR		< 16	355**	520-600	25	160-180 HB	-20 °C 40 J (long)
			16 < 40	345**	520-600	25	160-180 HB	-20 °C 40 J (long)
S355J2(M)	+AR	All formats	< 16	355**	490-630	22	150-190 HB	-20 °C 27 J (long)
		All formats	17 < 40	345**	490-630	22	150-190 HB	-20 °C 27 J (long)
		All formats	41 < 63	335**	490-630	21	150-190 HB	-20 °C 27 J (long)
			64 < 80	325**	490-630	30	150-190 HB	-20 °C 27 J (long)
S355K2	+AR		< 16	355**	470-630	22	140-190 HB	-20 °C 40 J (long)
			16 < 40	345**	470-630	22	140-190 HB	-20 °C 40 J (long)
			40 < 63	335**	470-630	21	140-190 HB	-20 °C 40 J (long)
S355L4	+AR		< 16	355**	470-630	22	140-190 HB	-40 °C 60 J (long)
			16 < 40	345**	470-630	22	140-190 HB	-40 °C 60 J (long)
			40 < 63	335**	470-630	21	140-190 HB	-40 °C 60 J (long)
			63 < 80	325**	470-630	20	140-190 HB	-40 °C 60 J (long)
			80 < 100	315**	470-630	20	140-190 HB	-40 °C 60 J (long)
285K	+AR	Tube, wall	-	450*	> 550	20	180 HB typical	-20 °C 27 J (long)
520 M (2721, 2723)	+AR		25 < 40	400*	520-630	22	< 200 HB	-20 °C 40 J (long)
		Round bar	40 < 63	390*	520-630	22	< 200 HB	-20 °C 40 J (long)
		Round bar	63 < 100	380*	520-630	21	< 200 HB	-20 °C 40 J (long)
		Round bar	100 < 200	350*	500-600	18	< 200 HB	-20 °C 27 J (long)
	+N	Round bar	25 < 40	345*	470-630	25	< 200 HB	-40 °C 40 J (long)
		Round bar	40 < 63	335*	470-630	24	< 200 HB	-40 °C 40 J (long)
		Round bar	63 < 80	325*	470-630	23	< 200 HB	-40 °C 40 J (long)
		Round bar	80 < 100	315*	470-630	23	< 200 HB	-40 °C 40 J (long)
		Round bar	100 < 150	295*	450-600	21	< 200 HB	-40 °C 40 J (long)
		Round bar	150 < 200	285*	450-600	20	< 200 HB	-40 °C 40 J (long)
550 M (2723)	+C	Round bar	22 < 55	500*	550-750	12	< 220 HB	20 °C 27 J (long)
	+SH	Round bar	55 < 70	380*	490-630	22	< 200 HB	-20 °C 27 J (long)
		Round bar	70 < 120	350	490-630	20	< 200 HB	-20 °C 27 J (long)

Variant	Condition ⓘ	Format	Dimension [mm]	Yield strength min [MPa]	Tensile strength [MPa]	Elongation A ₅ [%]	Hardness	Impact (ISO-V) strength _{min}
S355J2 EN10025-2:2019	+AR		< 16	355**	470-630	22	140-190 HB	-20 °C 27 J (long)
			16 < 40	345**	470-630	22	140-190 HB	-20 °C 27 J (long)
			40 < 63	335**	470-630	21	140-190 HB	-20 °C 27 J (long)
			63 < 80	325**	470-630	20	140-190 HB	-20 °C 27 J (long)
			80 < 100	315**	470-630	20	140-190 HB	-20 °C 27 J (long)

$R_{p0.2}$ * R_{eh} ** R_{el}

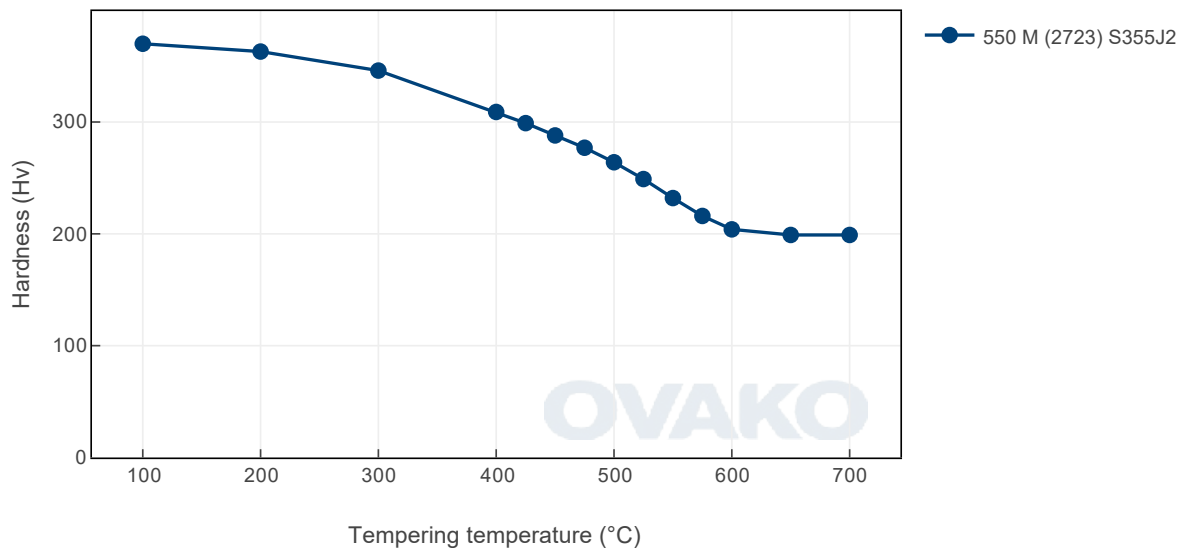
Transformation temperatures

	Temperature °C
MS	400
AC1	720
AC3	815

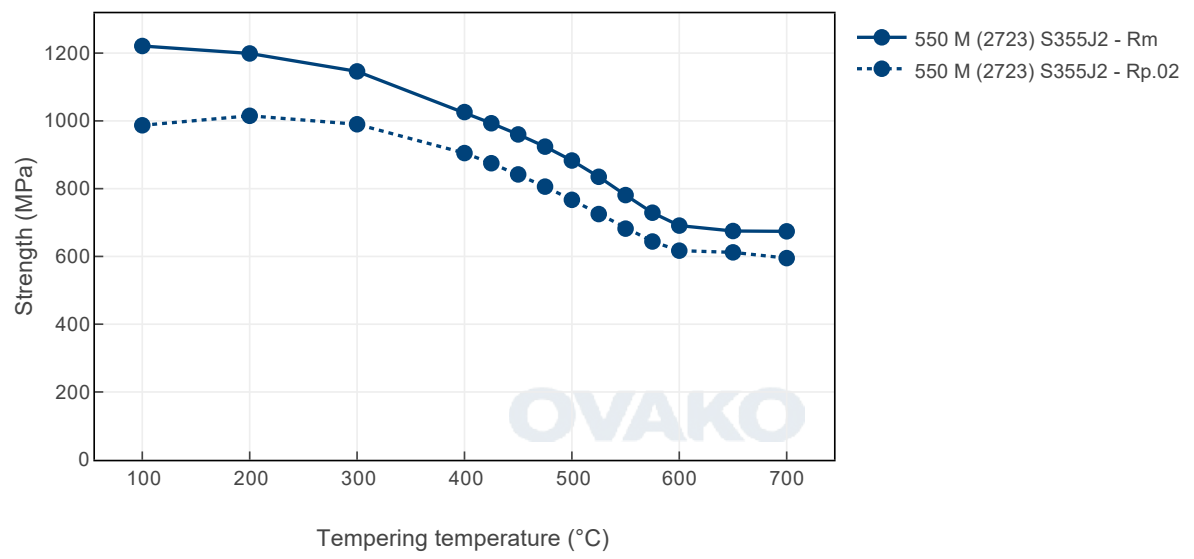
Heat Treatment Guide generated Graphs

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.

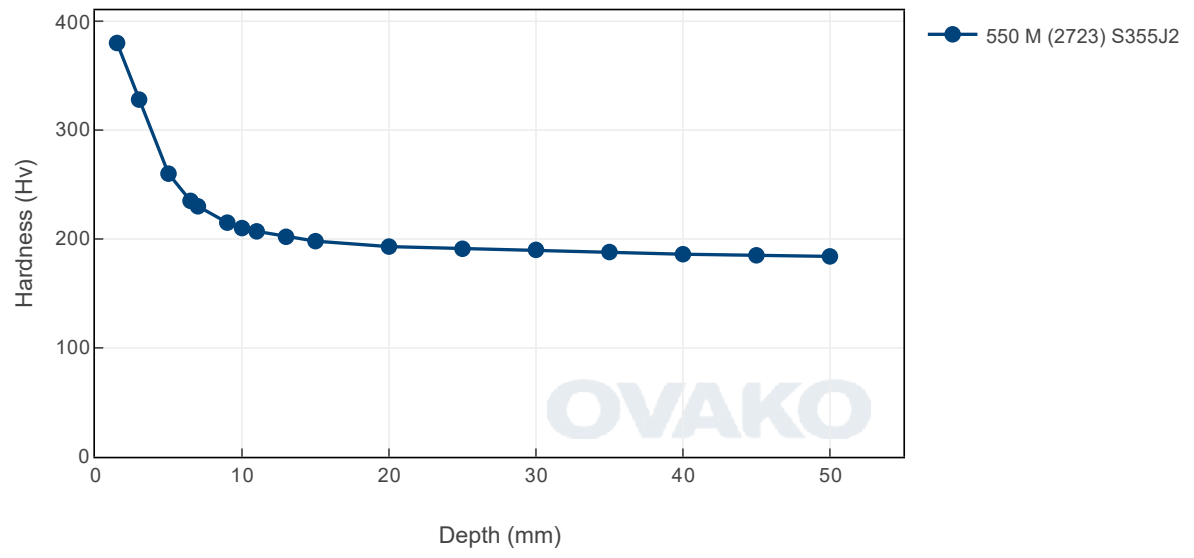
Tempering Diagram (hardness)



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](#).

In many international comparisons the crude steel Scope 1-2 emission is a key parameter, ie. the CO₂ 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 ₂ e/kg	120	62	76

To get the full picture of our products environmental impact we have to look at all of our CO₂ 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 ₂ e kg /1000 kg steel)	Climate compensated Net emission = Scope 3 (CO ₂ e kg /1000 kg steel) Scope 1 - 2 = 0 (compensated)
SB9813	Flat bar	+AR	404	167
550 M (2723)	Round bar	+AR	526	222
520 M (2721, 2723)	Round bar	+AR	525	221

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/m ³)
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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For more detailed information please visit <http://www.ovako.com/en/Contact-Ovako/>

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