

## 40NiCrMo7-3 All

### General Information

40NiCrMo7-3 is a quench and tempering steel with high toughness. Used for large axles, machine components etc. that require high tensile strength and high toughness. Can be flame or induction hardened.

6514 is intended for ASTM A320 L43 fasteners in low-temperature service.

Ovako 355B The grade is inside the SAE 4340 specification but is slightly enhanced with Vanadium for improved tempering resistance. The grade has a low controlled sulphur content to ensure machinability yet with a high sulphidic cleanliness. Oxygen content is kept low for high oxidic cleanliness. The steel is of Bearing Quality cleanliness (BQ).

Through hardenability corresponding to a bar with approx. Ø100mm (oil quenching)

Delivered in as-rolled, soft annealed, normalized or quench and tempered condition

### BQ-Steel®

BQ-Steel® is a bearing quality clean steel optimized for fatigue strength and is also ideal for new design solutions outside the bearing industry.

### Similar designations

AISI 4340

### Chemical composition

Variant	Cast	DI	Weldability		C%	Si %	Mn %	P%	S%	Cr%	Ni%	Mo %	V%
6514	CC	3.75	CEV <sub>max</sub>	Min	0.38	0.15	0.60	-	-	0.70	1.65	0.20	-
			Pcm <sub>max</sub>	Max	0.43	0.35	0.85	0.035	0.040	0.90	2.00	0.30	-
355B	IC		CEV 0.99 <sub>max</sub>	Min	0.38	0.15	0.65	-	0.004	0.70	1.65	0.20	0.080
			Pcm 0.61 <sub>max</sub>	Max	0.43	0.35	0.85	0.015	0.008	0.90	2.00	0.30	0.120

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> [%]	Impact (ISO-V) strength <sub>min</sub>
6514	+QT	Round bar	25 < 130	725*	> 860	16	50	-101 °C 27 J (long)

*Rp0.2* \* *ReH*, \*\* *ReI*

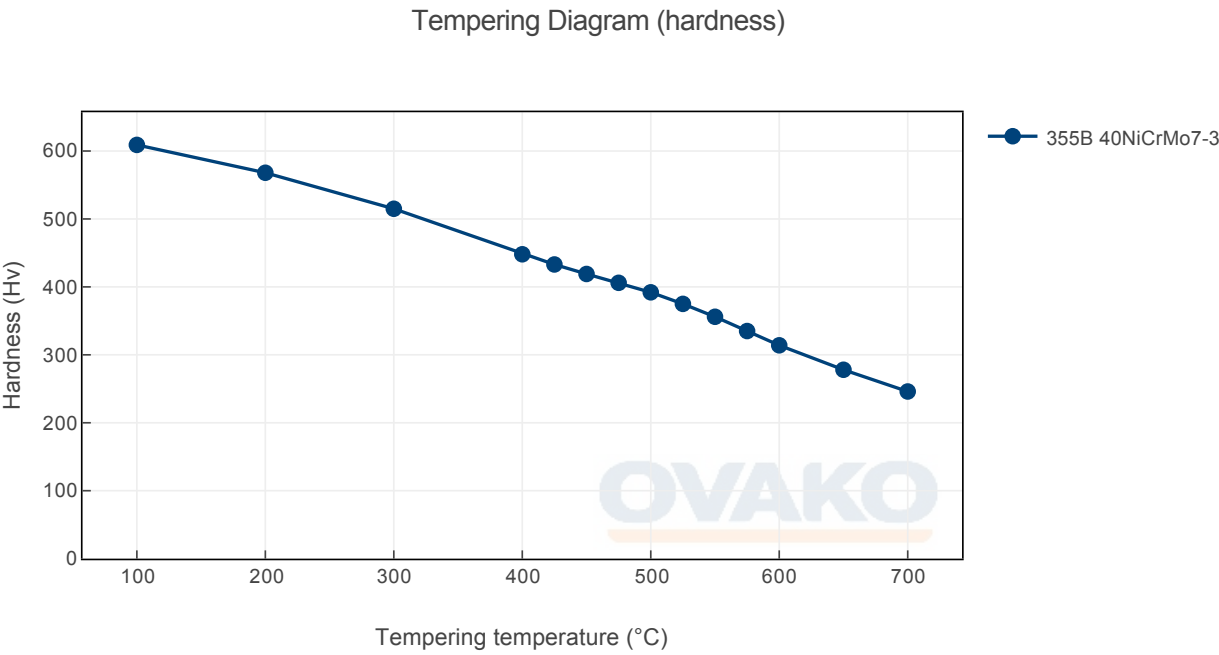
Transformation temperatures

	Temperature °C
MS	296
AC1	707
AC3	768

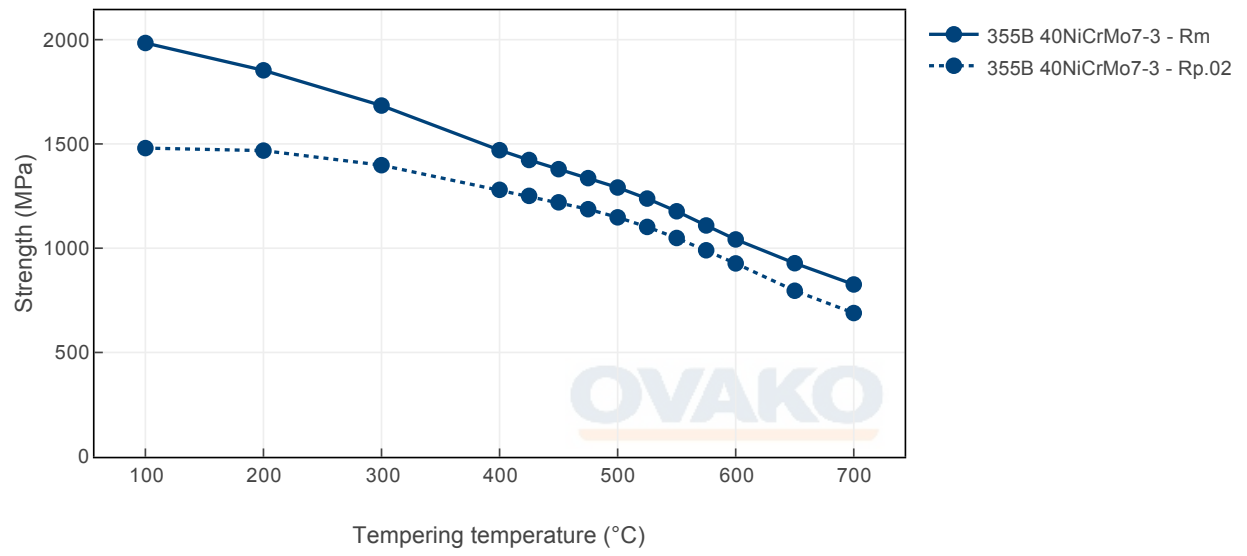
Valid for variant 6514

Heat Treatment Guide generated Graphs

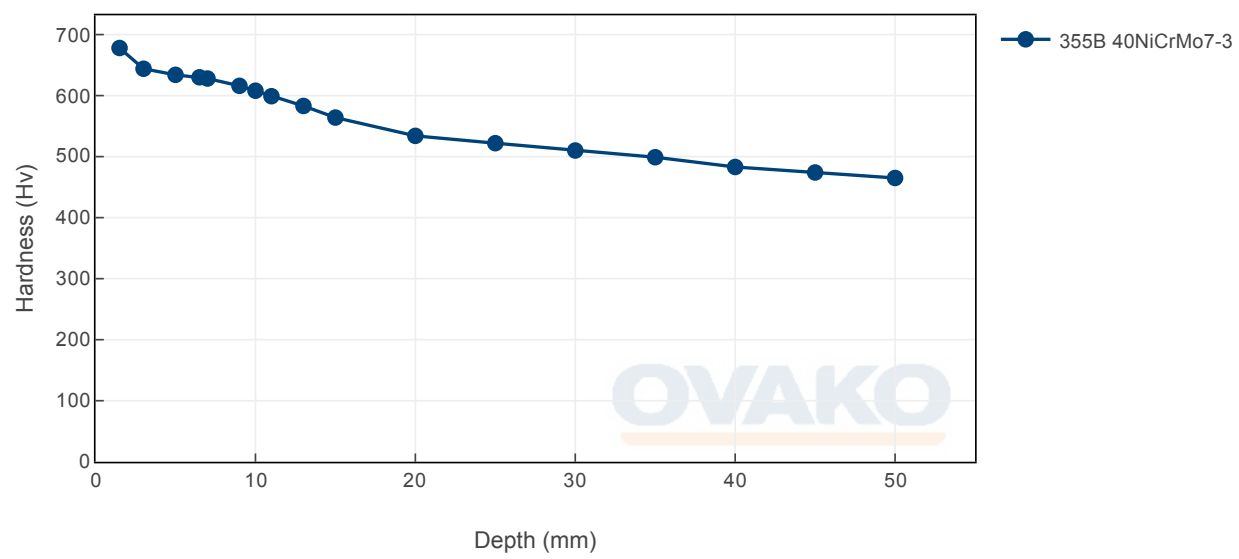
The following graphs are generated from a theoretical model. For further info see the Heat treatment guide module. Select a specific grade version for individual display.



Tempering Diagram (strength)



# Jominy



## Steel cleanliness

Micro inclusions steel grade 355B									Macro inclusions steel grade 355B	
Applied standard	ASTM E45								Applied standard	ISO 3763 (Blue fracture)
Sampling	ASTM A295								Sampling	Statistical testing on billets
Maximum average limits	A		B		C		D		Limits	< 2,5 mm/dm <sup>2</sup>
	Th	He	Th	He	Th	He	Th	He		
	2,0	1,5	0,8	0,1	0	0	0,5	0,4		

## 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<sub>2</sub> 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 <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	Scope 1-3 (CO <sub>2</sub> e kg /1000 kg steel)	Climate compensated Net emission = Scope 3 (CO <sub>2</sub> e kg /1000 kg steel) Scope 1 - 2 = 0 (compensated)
355B	Round bar	+AR	876	483
355B	Round bar	+SA	882	485
355B	Tube, wall	+AR	927	526
355B	Tube, wall	+SA	928	526
ASTM A320 L43, 6514	Round bar	+AR	739	458
ASTM A320 L43, 6514	Round bar	+QT	1036	549

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/m <sup>3</sup> )
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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