

## STEEL GRADE

Last revised: Thu, 30 Jan 2025 10:40:28 GMT

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 a conti cast grade intended for ASTM A320 L43 fasteners in low-temperature service.

355B is ingot cast too and inside the SAE 4340 specification but is slightly enhanced with Vanadium for improved tempering resistance.

355E is an ingot cast grade specially designed to comply with API 20E BSL3 L43 fasteners

Both 355B and 355E have a low controlled sulphur content for high sulphidic cleanliness and Oxygen content is kept low for high oxidic cleanliness. Giving that both follow the Ovako Bearing Quality cleanliness (BQ).

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
355E	IC		CEV <sub>max</sub>	Min	0.39	0.20	0.70	-	-	0.80	1.78	0.25	-
			Pcm <sub>max</sub>	Max	0.43	0.29	0.80	0.015	0.005	0.90	2.00	0.30	-

## 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)

*R<sub>p0,2</sub> \* R<sub>eh</sub>, \*\* R<sub>el</sub>*

## Transformation temperatures

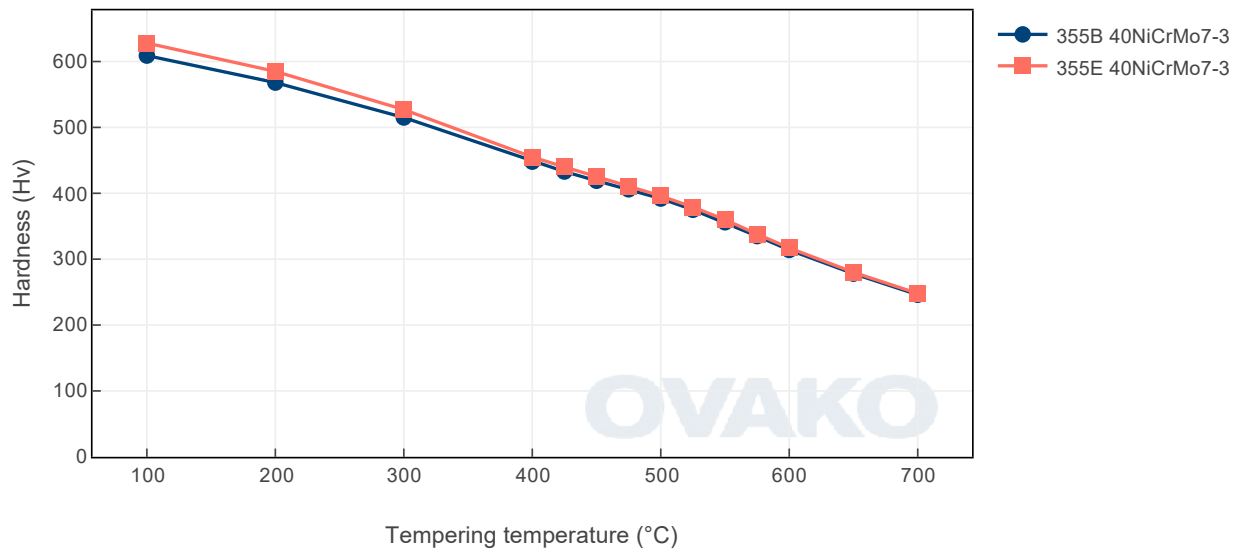
	Temperature °C
MS	296
AC1	707
AC3	768

Valid for variant 6514

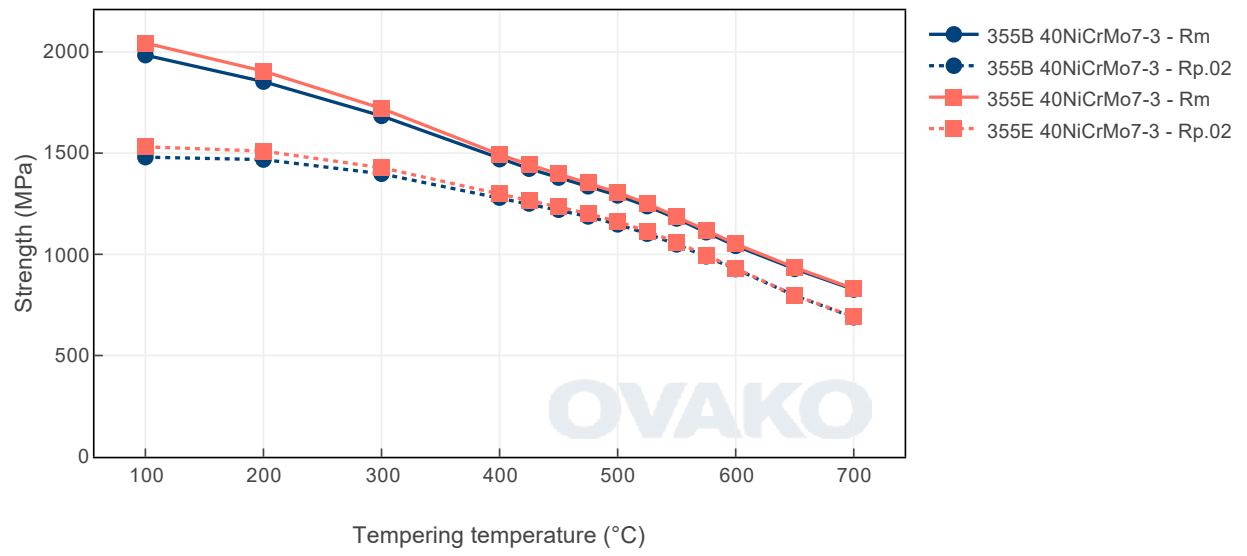
## Heat Treatment Guide generated Graphs

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.

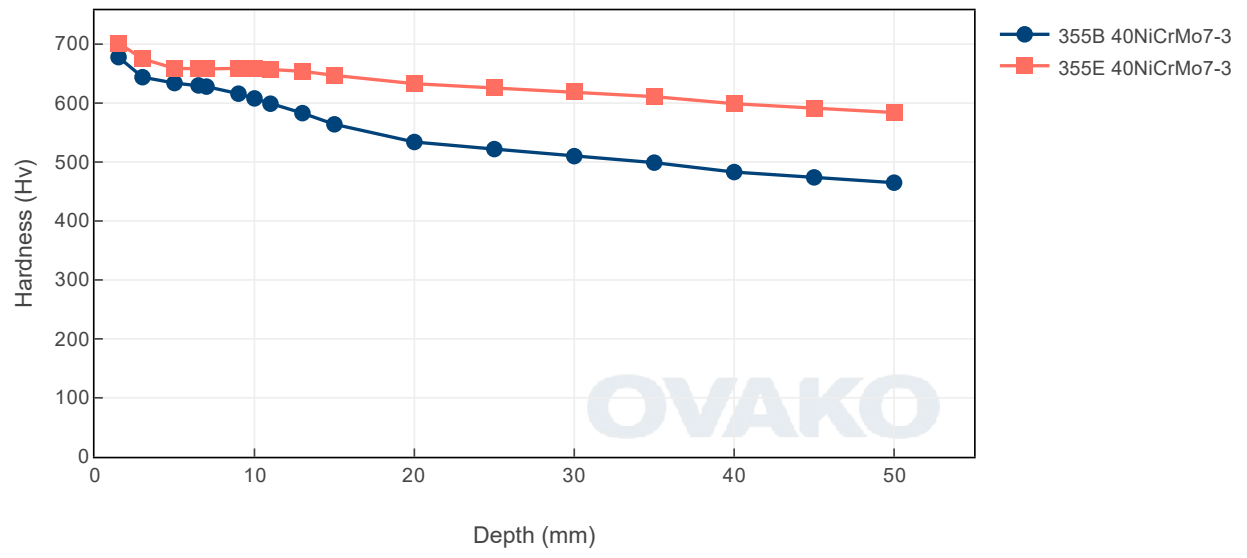
Tempering Diagram (hardness)



Tempering Diagram (strength)



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## 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](#).

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 <sup>i</sup>	Scope 1-3 (CO2e kg /1000 kg steel)
355B	Round bar	+AR	885
355B	Round bar	+SA	891
355B	Tube,wall	+AR	931
355B	Tube,wall	+SA	933
ASTM A320 L43, 6514	Round bar	+AR	739
ASTM A320 L43, 6514	Round bar	+QT	1036

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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Via telephone: +46 8 622 1300

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

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