

STEEL GRADE

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12NiCr14-6*

All

General Information

12NiCr14-6* is a case hardening steel with high toughness of the type SAE 3311.

Ovako 245S - Is an ingot cast steel following Ovako internal BQ-Steel demands ensuring a high microscopic and macroscopic cleanliness.

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

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

SAE 3311

Chemical composition

Variant	Cast		C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %
245S	IC	Min	0.10	0.15	0.40	-	0.003	1.35	3.25	-
		Max	0.15	0.35	0.60	0.015	0.008	1.60	3.75	0.15

Mechanical Properties

Variant	Condition	Format	Hardness
245S	+A	All formats	170-229 HB

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

Transformation temperatures

	Temperature °C
MS	395
AC1	694
AC3	806

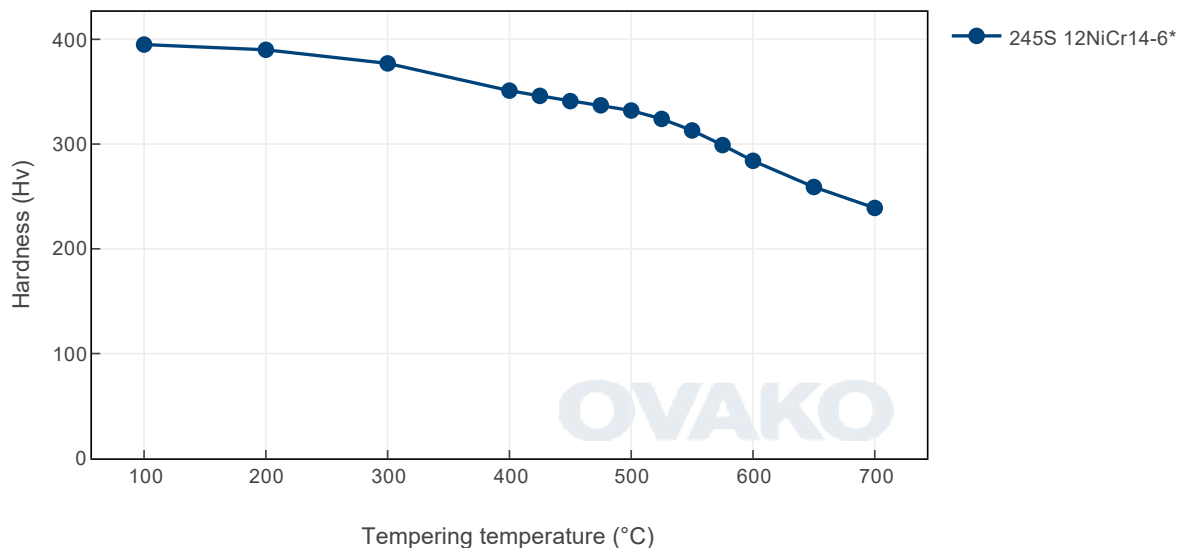
Heat treatment recommendations

Treatment	Condition	Temperature cycle	Cooling/quenching
Hot forging	+AR	800-1200C	In air
Normalizing	+N	860-890C	In air
Soft annealing	+A	670C, 15h	In air
Carburizing	+C	850-930C	-
Quench & Tempering	+QT	840-890C	In oil
Hardening	+QT	780-850C, hardening of as-carburized component	In oil

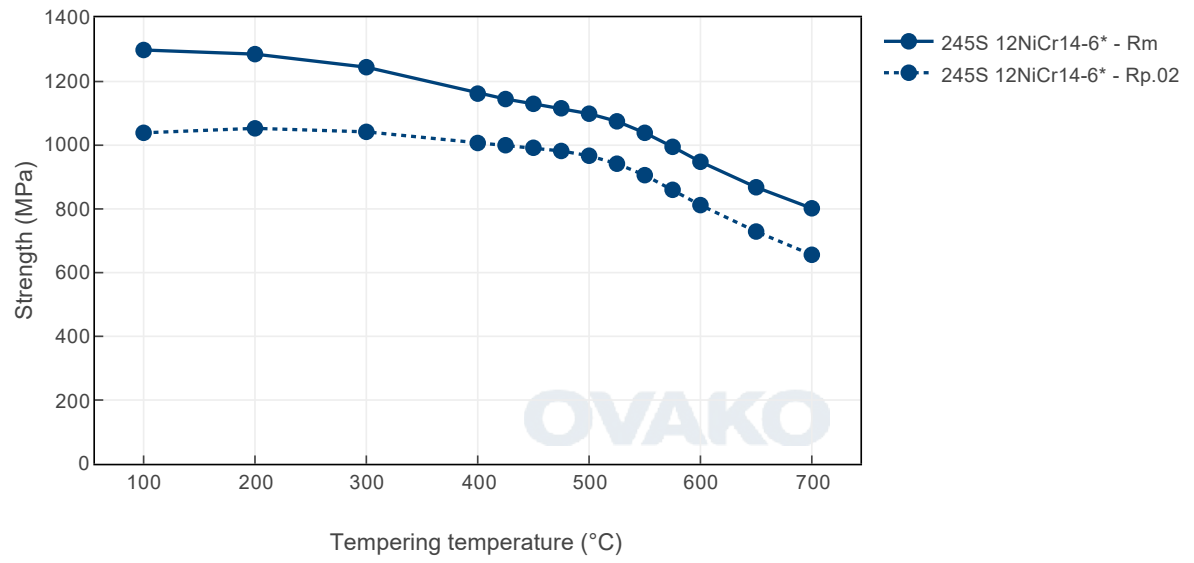
Heat Treatment Guide generated Graphs

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.

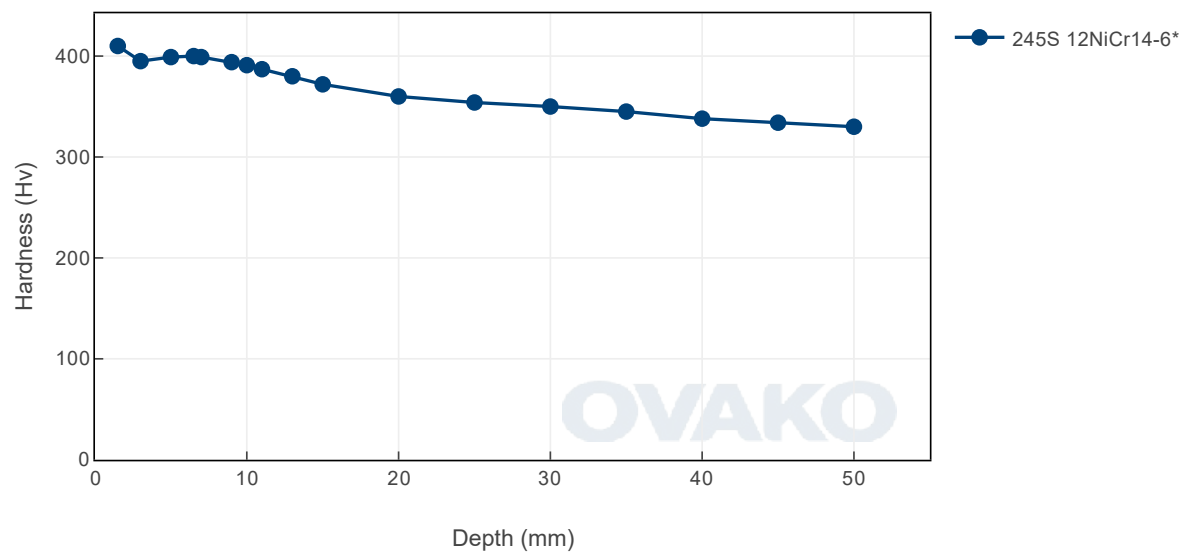
Tempering Diagram (hardness)



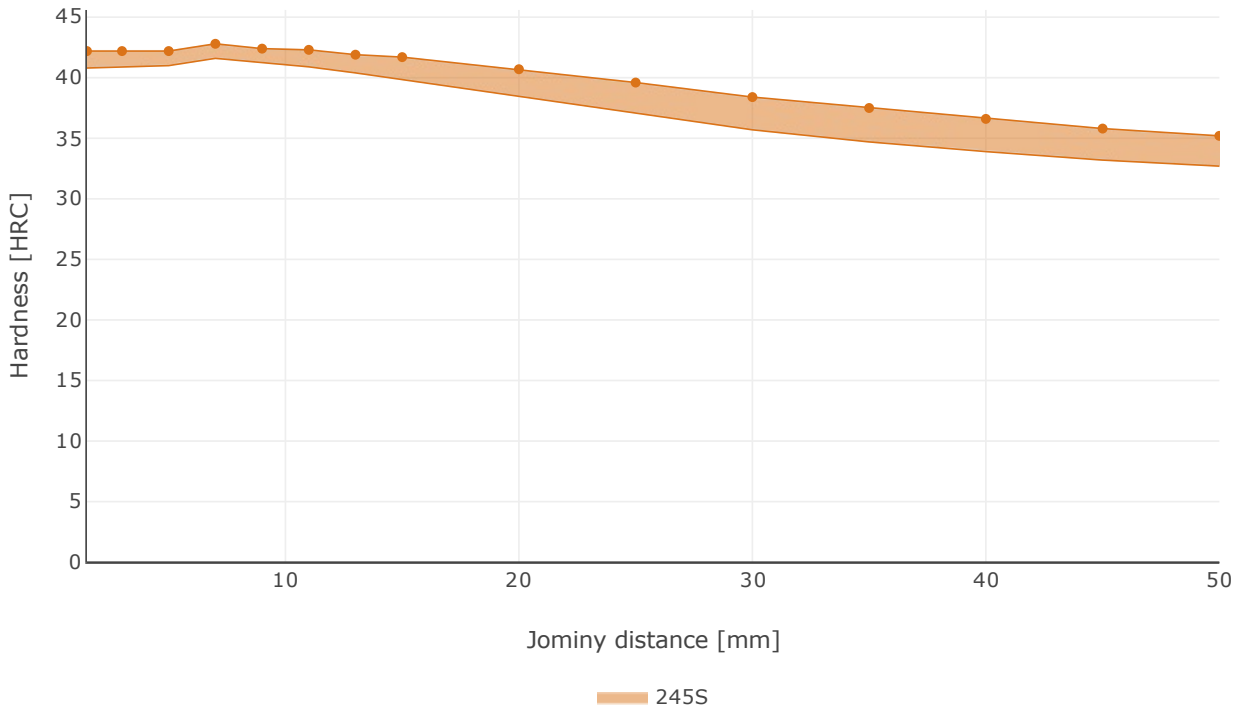
Tempering Diagram (strength)



Jominy

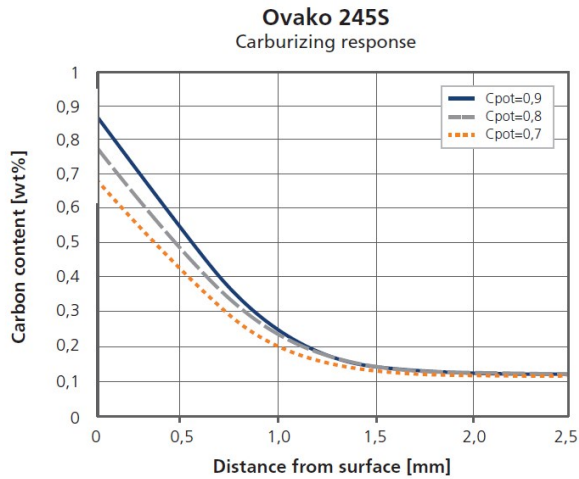


Hardenability

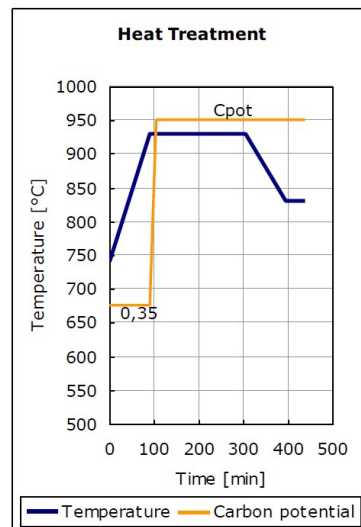


Jominy hardenability of Ovako 245S. Average value with +/- standard deviation. Austenitizing temperature 845°C.

Carburizing response



Heat treatment



Steel cleanliness

Micro inclusions									Macro inclusions	
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	< 5 mm/dm ²
	Th	He	Th	He	Th	He	Th	He		
	2,5	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 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 (CO2e kg /1000 kg steel)	Climate compensated Net emission = Scope 3 (CO2e kg /1000 kg steel) Scope 1 - 2 = 0 (compensated)
245S	Round bar	+AR	1180	780
245S	Round bar	+SA	1187	786
245S	Tube,wall	+AR	1251	854
245S	Tube,wall	+SA	1254	856

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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 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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