

## C60E All

### General Information

Ovako 061 is an ingot casted steel of BQ ( Bearing Quality). High hardness (approx. 60HRC) and high strength can be achieved after hardening due to the relatively high carbon content. The steel is suitable for various type of applications where high strength is needed. The steel grade fulfils most of the C60E standard and have a tighter composition range in order to have consistent properties

### 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

1.1221, ASTM/SAE 1060

### Chemical composition

Variant	Cast	Weldability		C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	DI %
061A	IC	CEV 0.82 <sub>max</sub>	Min	0.58	0.05	0.55	-	-	0.15	-	-	1.40
		Pcm 0.69 <sub>max</sub>	Max	0.61	0.15	0.65	0.020	0.007	0.22	0.15	0.08	1.60
C60E EN 10083-2:2006 ref	Std	CEV <sub>max</sub>	Min	0.57	-	0.60	-	-	-	-	-	-
		Pcm <sub>max</sub>	Max	0.65	0.40	0.90	0.030	0.035	0.40	0.40	0.10	-

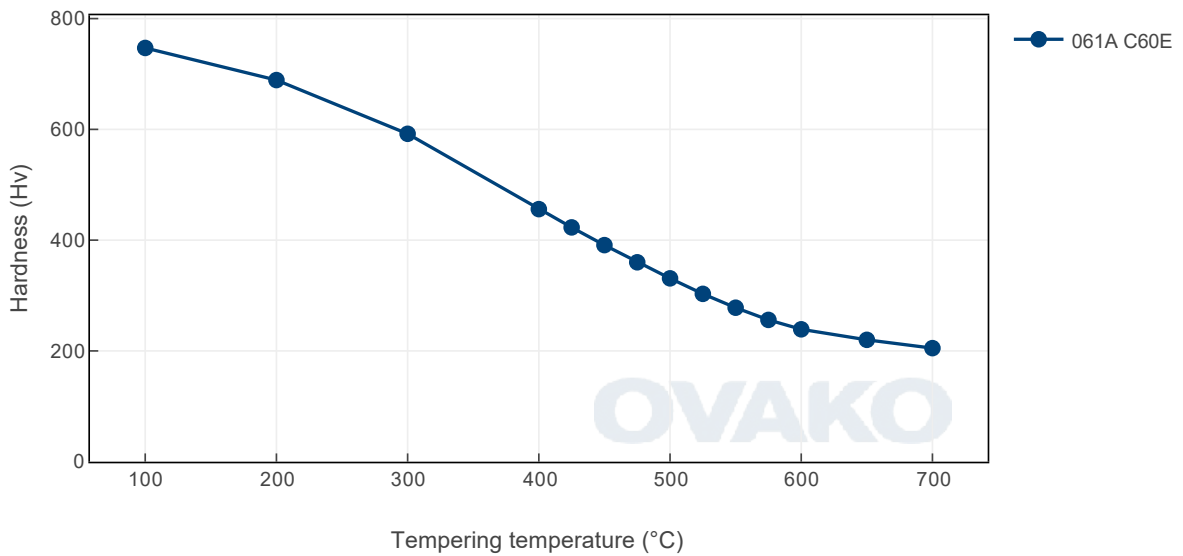
## Transformation temperatures

	Temperature °C
MS	271
AC1	720
AC3	746

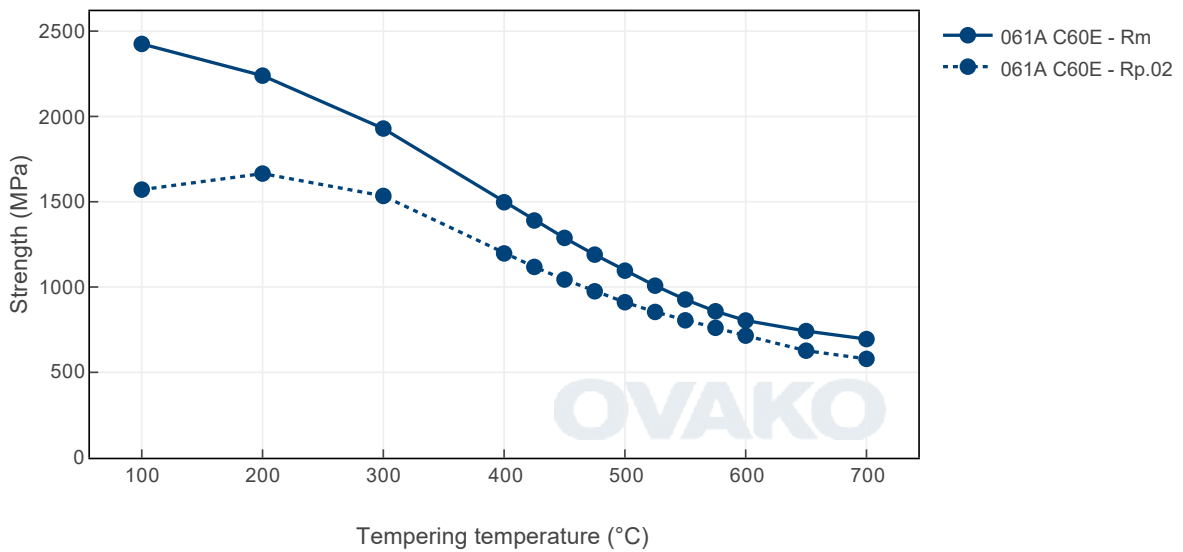
## Heat Treatment Guide generated Graphs

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.

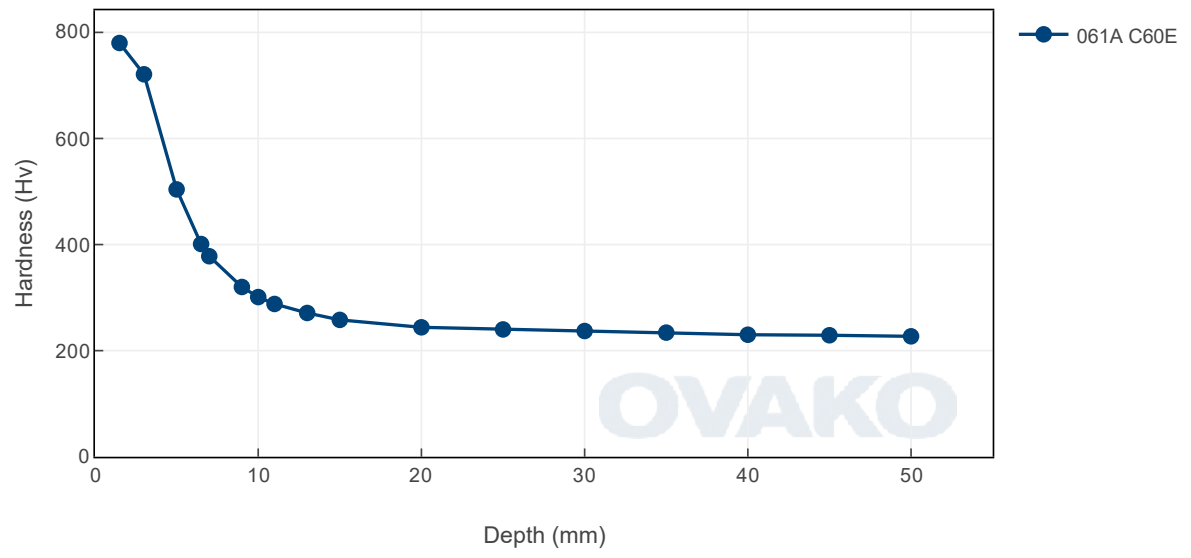
Tempering Diagram (hardness)



Tempering Diagram (strength)

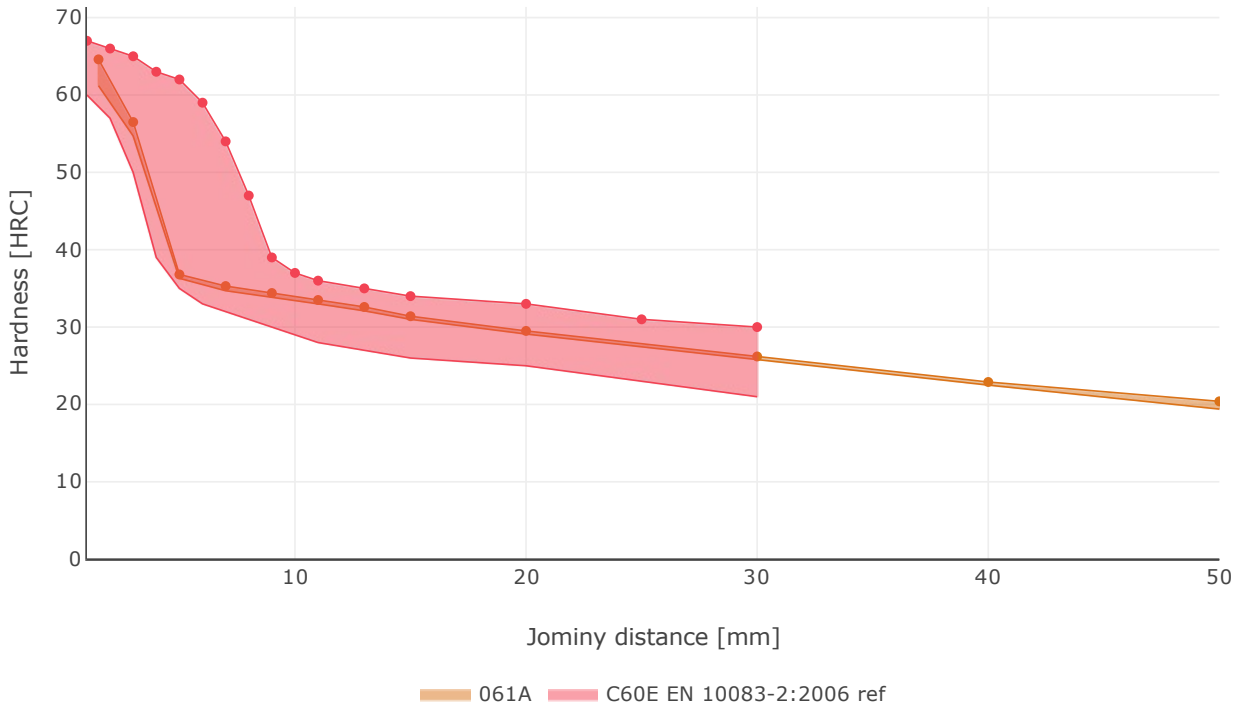


# Jominy





## Hardenability



## 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	
	Th	He	Th	He	Th	He	Th	He
	2,0	1,5	0,5	0,1	0	0	0,2	0,1
Limits	< 2,5 mm/dm <sup>2</sup>							

## 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 <sup>①</sup>	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)
061A	Round bar	+AR	566	173
061A	Round bar	+QT	572	174
061A	Tube,wall	+AR	589	188
061A	Tube,wall	+QT	595	189

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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Via telephone: +46 8 622 1300

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

### Disclaimer

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