MATERIAL DATA SHEET

STEEL GRADE

Last revised: Thu, 30 Jan 2025 11:35:26 GMT

OVAKO

C35 All

General Information

C35 is a medium Carbon steel, one of the most widely used for machinery parts. Exellent forgeability. Special variants ca be made avaiable for cold drawing. Due to the carbon content preheating and postheating are required when welding. Wide range of mechanical properties can be attained by quenching and tempering.

Similar designations

C35E, DIN Ck35, 080M36, XC38, 1035, GOST 35

Chemical composition

Variant	Cast	Di	Weldability		C %	Si %	Mn %	P %	S %	Cr %	Ni %
C35E	CC	0.98	CEV 0.65_{max}	Min	0.35	0.15	0.50	-	0.015	-	-
			Pcm 0.49_{max}	Max	0.39	0.35	0.80	0.030	0.035	0.30	0.30

Mechanical Properties

Variant	Condition	Format	Dimension [mm]	Yield strength min [MPa]	Tensile strength [MPa]	Elongation A_5 [%]	Hardness	Impact (ISO-V) $strength_{min}$
C35E	+AR	Round bar	< 20	345*	520-690	10	< 230 HB	0 °C 0 J (long) 0 °C 0 J (transv)
		Round bar	20 < 90	345*	520-690	19	165-220 HB	-

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

Transformation temperatures

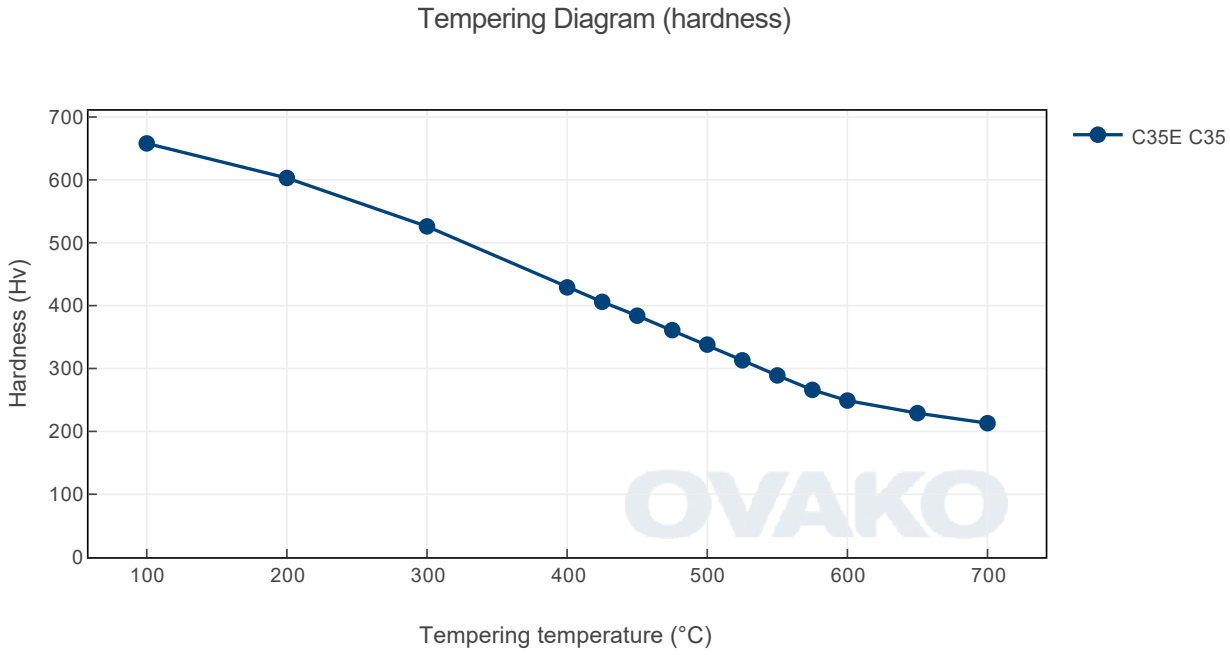
	Temperature °C
MS	355
AC1	722
AC3	781

Heat treatment recommendations

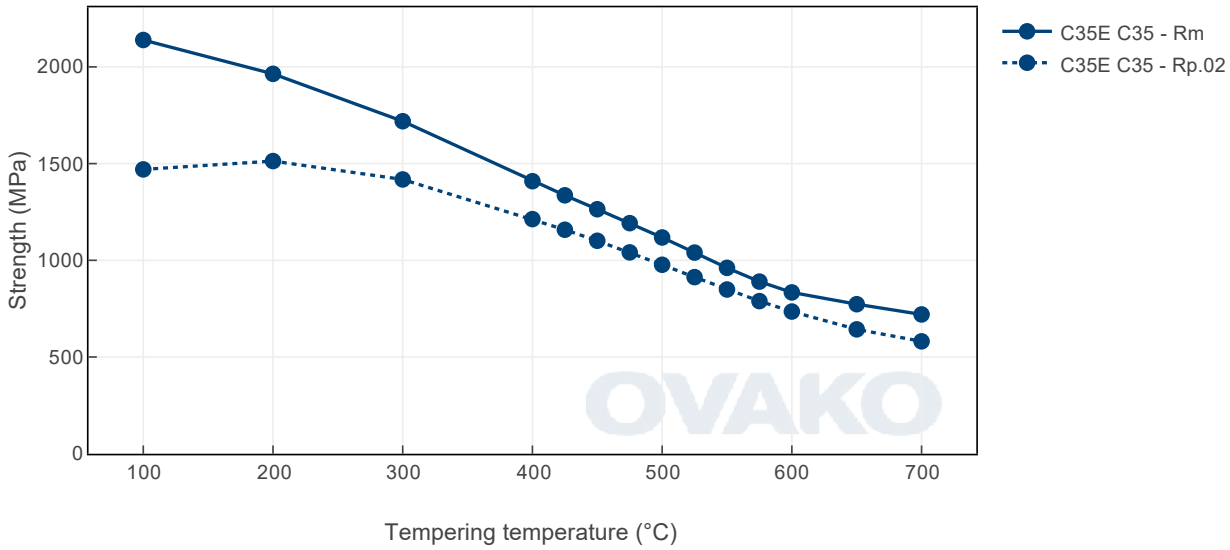
Treatment	Condition	Temperature cycle	Cooling/quenching
Hot forging	+AR	Heat to 1245ºC	Cooling in air
Normalizing	+AR	Heat to 915ºC (min 800ºC)	Cooling in air
Quench & Tempering	+AR	Hardened at 845ºC	Quenching in oil
Tempering	+QO	Tempering at 370ºC in order to get tensile strength in the range 620-860 MPa	

Heat Treatment Guide generated Graphs

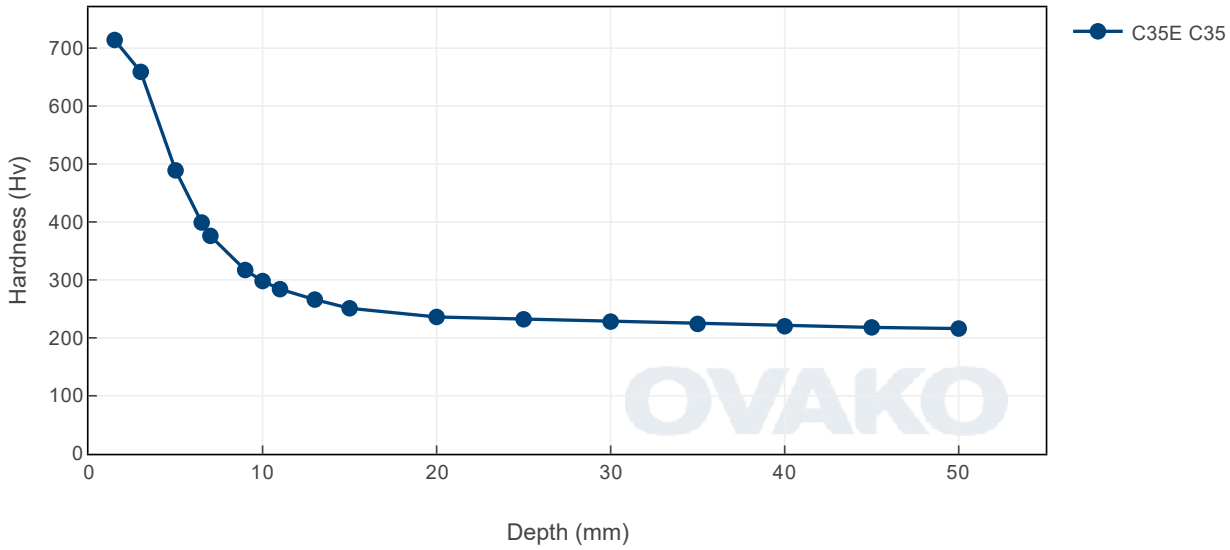
The following graphs are generated from a theoretical model. For further info see the Heat treatment guide module. Select a specific grade version for individual display.



Tempering Diagram (strength)



Jominy


C35E C35
Hardness (Hv)
700
600
500
400
300
200
100
0
0
10
20
30
40
50
Depth (mm)
OVAKO

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_2 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)
C35E	Flat bar	+AR	393	156

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/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 resistivityAmbient 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:

Via e-mail: info@ovako.com

Via telephone: +46 8 622 1300

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