MATERIAL DATA SHEET STEEL GRADE

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





General Information

C35 is a medium Carbon steel, one of the most widely used for machinery parts. Exellent forgeability. Special variants ca be made available 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		С%	Si %	Mn %	Р%	S %	Cr %	Ni %
C35E	сс	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	Gondition	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	G Condition	Temperature cycle	Cooling/quenching
Hot forging	+AR	Heat to 1245°C	Cooling in air
Normalizing	+AR	Heat to 915°C (min 800°C)	Cooling in air
Quench & Tempering	+AR	Hardened at 845°C	Quenching in oil
Tempering	+QO	Tempering at 370°C 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 (hardness)

Tempering temperature (°C)



Jominy



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	Format	G	Scope 1-3 (CO2e kg	Climate compensated Net emission = Scope 3 (CO2e kg /1000
Grade		Condition	/1000 kg steel)	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:

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

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