MATERIAL DATA SHEET

STEEL GRADE

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OVAKO

C55 All

General Information

C55 is a carbon steel for general purposes found in three variants in EN ISO 683-1.

510A is an ingot casted steel. 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

056K is a low alloyed steel for quench and tempering. Used for machine parts etc. Can be induction or flame hardened

8665 is a continuous casted variant meeting all three of the EN ISO standards.

For additional Heat Treatment Data, please visit the Heat Treatment Guide.

Similar designations

C54, C55E - 1.1203, C55R - 1.1209, 070M55 (BS970), ASTM/SAE 1055, SS 1655, C55R, Cf53, 1.1213

Chemical composition

Variant	Cast	Weldability		C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %
C55 EN ISO 683-1	Std	CEV 0.83_{max}	Min	0.52	0.10	0.60	-	-	-	-	-
		Pcm 0.65_{max}	Max	0.60	0.40	0.90	0.045	0.045	0.40	0.40	0.10

Cr+Ni+Mo ≤ 0.63

Mechanical Properties

Variant	Condition	Format	Dimension [mm]	Yield strength min [MPa]	Tensile strength [MPa]	Elongation A_5 [%]	Reduction of area Z_{min} [%]
C55 EN ISO 683-1	+QT	Round bar	< 16	550*	800-950	12	30
		Round bar	16.1 < 40	490*	750-900	14	35
		Round bar	40.1 < 100	420*	700-850	15	40
		Flat bar	< 8	550*	800-950	12	30
		Flat bar	8.1 < 20	490*	750-900	14	35

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

Transformation temperatures

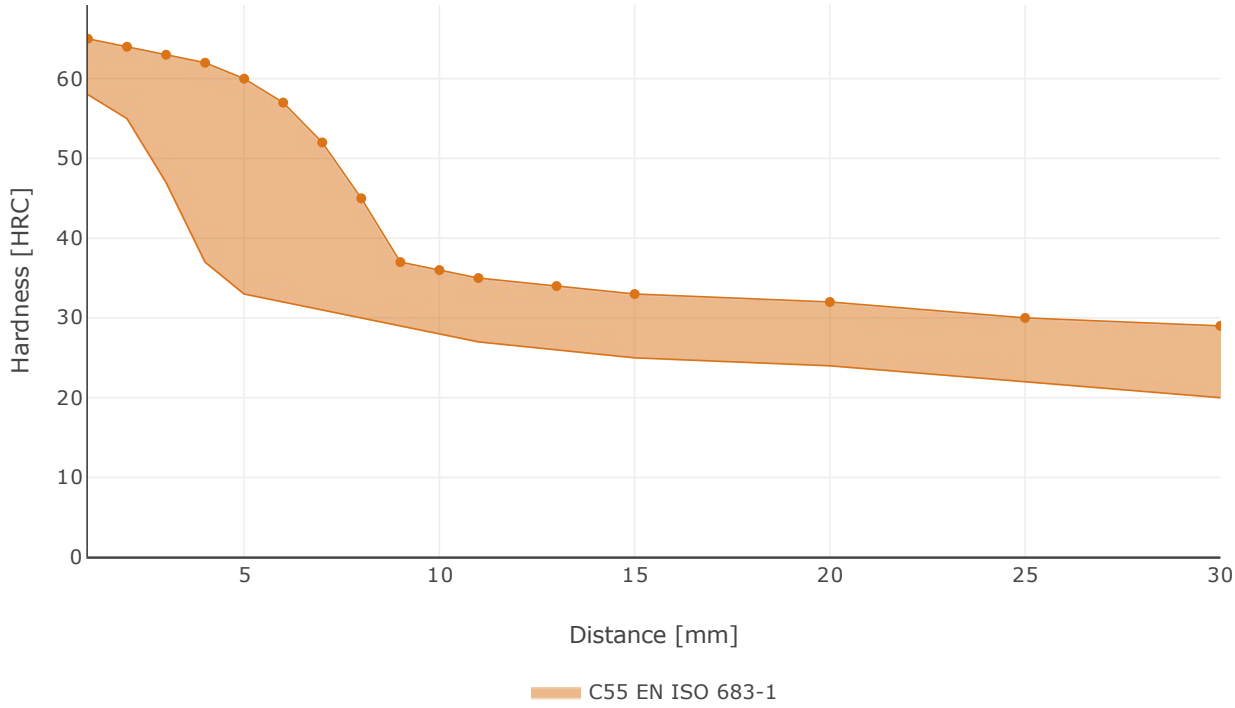
	Temperature °C
MS	270
AC1	720
AC3	750

Heat treatment recommendations

Treatment	Condition	Temperature cycle	Cooling/quenching
Hot forging	+AR	850-1100°C	In air
Normalizing	+N	790-820°C	In still air
Soft annealing	+SA	680-710°C 2-4h, 15°C/h to 600°C	In still air
Hardening	+QT	790-820°C	In oil, temper immediately
Tempering	+QT	150-650°C 1h see tempering diagram	In still air

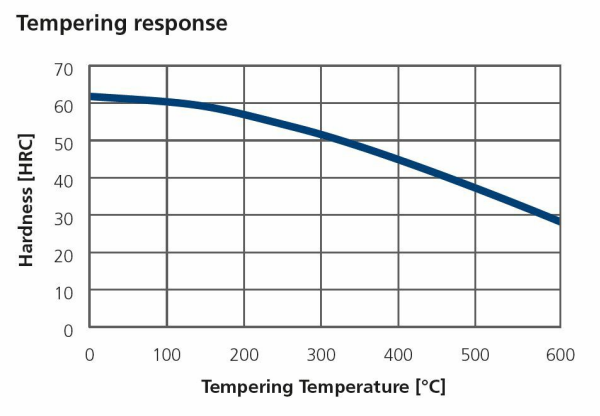
Data valid for Ovako 510A.

Hardenability



C55 ISO 683-1 shows the Jominy band for C55E/C55R +H

510A



Steel cleanliness

Micro inclusions - 510A								
Applied standard	ASTM E45							
Sampling	ASTM A295							
Maximum average limits	A		B		C		D	
	Th	He	Th	He	Th	He	Th	He
	2.5	1.5	1.5	0.5	0	0	1.0	0.5

Macro inclusions - 510A	
Applied standard	ISO 3763 (Blue fracture)
Sampling	Statistical testing on billets
Limits	< 5 mm/dm^2

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)
510A	Round bar	+AR	570	171
510A	Round bar	+QT	575	174
510A	Tube,wall	+AR	589	191
510A	Tube,wall	+QT	597	197
056K	Round bar	+AR	568	169
056K	Round bar	+QT	573	172
056K	Tube,wall	+AR	587	189
056K	Tube,wall	+QT	595	196
SBC55	Flat bar	+AR	405	168

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/