MATERIAL DATA SHEET

STEEL GRADE

Last revised: Wed, 15 Jan 2025 16:05:37 GMT

OVAKO

100CrMnSi6-6 All

General Information

Ovako 832 is a through hardening bearing steel that is mainly used for medium sized bearing rings, but can also be used for machine components that require high tensile strength and high hardness.

- 40 mm maximum wall thickness for through hardening
- Used for martensitic hardening
- Can be induction hardened
- Good machinability in soft annealed condition
- Machiable in hardened condition using hard-turning techniques (CBN tools)
- Ovako 832 is weldable if pre-heated, otherwise risk of hot-cracking
- Very good dimension stability

832K - Bearing quality (BQ) variant

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

100CrMnSi6-4, ASTM A485 grade 2/B4

Chemical composition

Variant	Cast		C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %
832K	IC	Min	0.87	0.60	1.50	-	-	1.40	0.10	0.06
		Max	0.97	0.80	1.70	0.015	0.015	1.70	0.25	0.10
EN ISO 683-17	Std	Min	0.93	0.45	1.40	-	-	1.40	-	-
		Max	1.05	0.75	1.70	0.025	0.015	1.65	-	0.10

Mechanical Properties

Variant	Condition	Format	Dimension [mm]	Yield strength min [MPa]	Tensile strength [MPa]	Hardness
832K	+SA	All formats	24 < 190	-	-	230 HB typical
	+Q/T(m)	Ring, wall	< 15	1700	2300 typical	62 HRC typical

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

Transformation temperatures

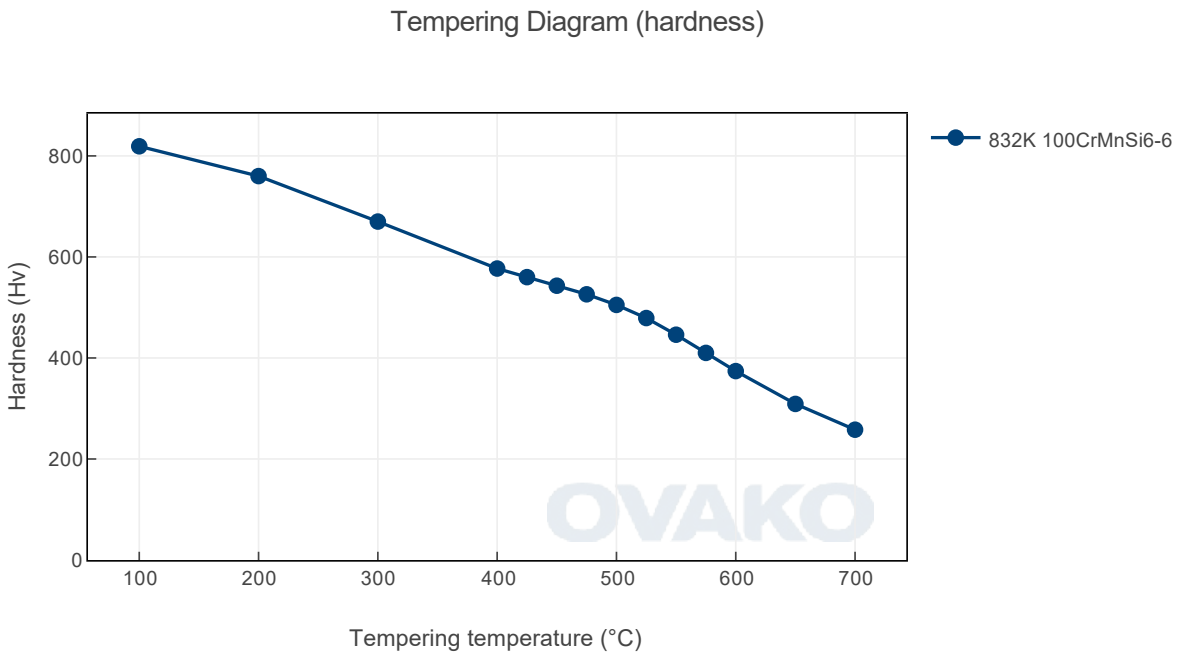
	Temperature °C
MS	229
AC1	749
AC3	723

Heat treatment recommendations

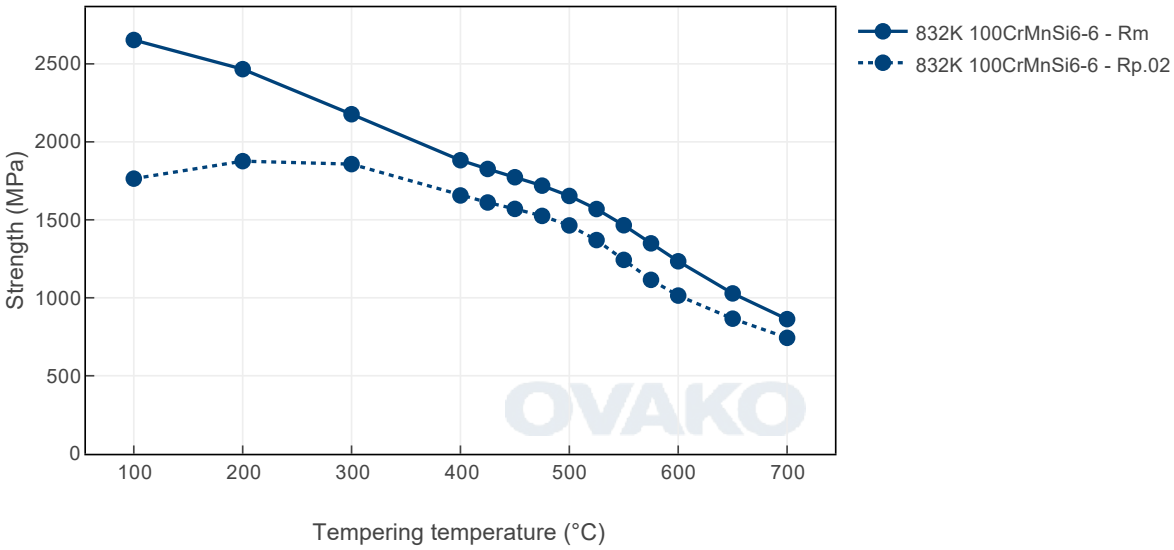
Treatment	Condition	Temperature cycle	Cooling/quenching
Hot forging	+U	800-1100C	In air
Normalizing	+N	880-910C	In air
Spheroidize annealing	+SA	RT-810°C 1h, 810°C 2h, 810-740°C 1h, 740-650°C 10h	In air
Stress relieve annealing	+SRA	550-650C 2h	In air
Quenching	+Q	830-870C 20-60 min (martensitic)	Oil quench (temper within 2h)
Tempering	+T	160-500C (see diagram)	In air

Heat Treatment Guide generated Graphs

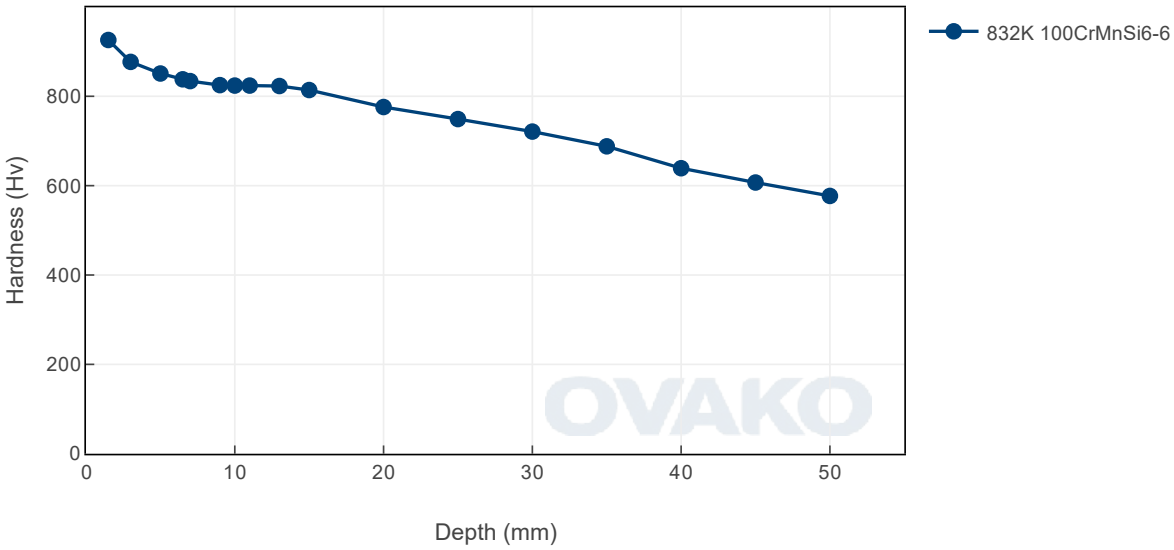
The following graphs are generated from a theoretical model. For further info see the Heat treatment guide module. Select a specific grade version for individual display.



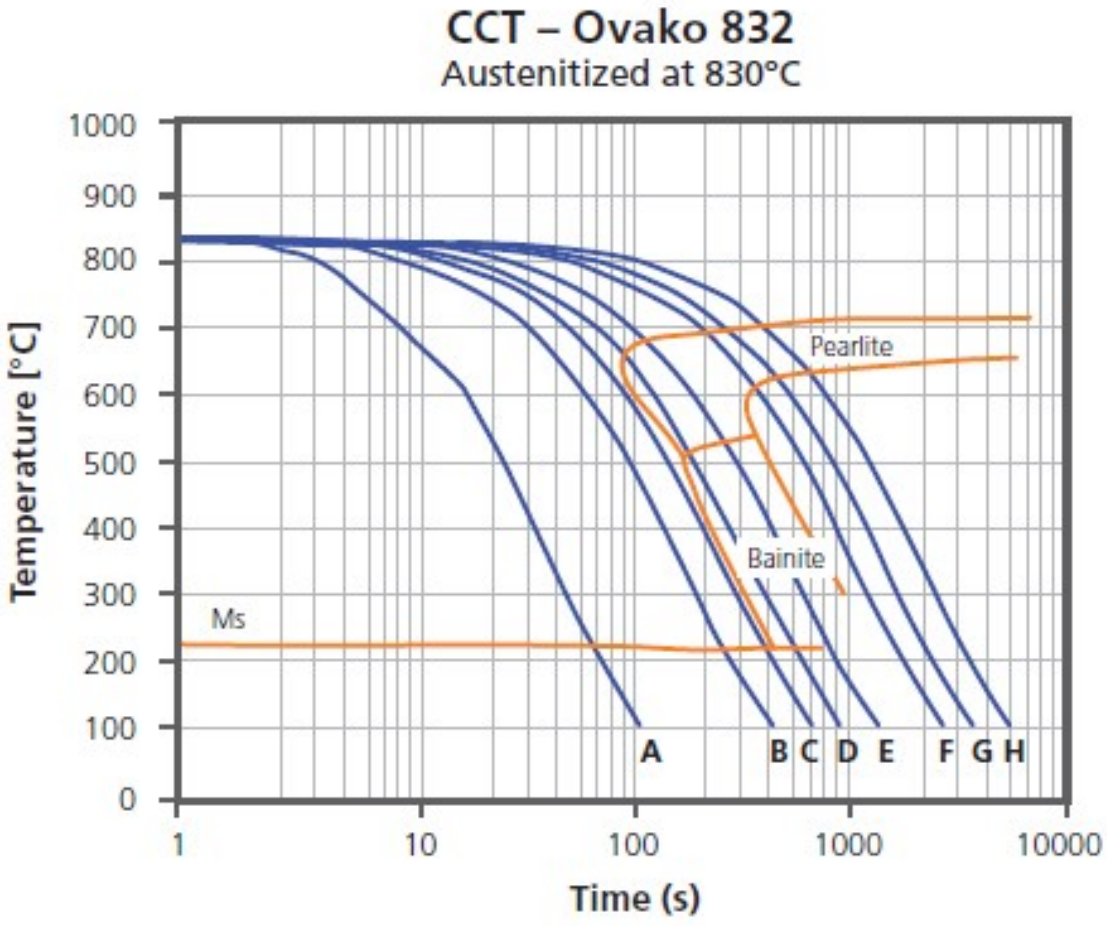
Tempering Diagram (strength)



Jominy

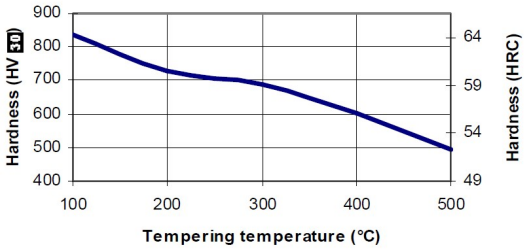

832K 100CrMnSi6-6
Hardness (Hv)
0
200
400
600
800
0
10
20
30
40
50
Depth (mm)
OVAKO

CCT



	A	B	C	D	E	F	G
T_{8-5}[s]:	25	100	150	200	500	800	1200
Hv_{30}:	820	813	750	627	410	316	316

Tempering response



Tempering response for Ovako 832K. Austenitized at 830°C for 30min and hardened in air. Tempered one hour at each tested temperature level

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	< 2,5 mm/dm^2
	Th	He	Th	He	Th	He	Th	He		
	2,0	1,5	0,8	0,1	0	0	0,5	0,3		

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)
832K	Round bar	+SA	638	237
832K	Tube,wall	+SA	661	264

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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 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/

Disclaimer