MATERIAL DATA SHEET

STEEL GRADE

Last revised: Wed, 15 Jan 2025 16:03:46 GMT

OVAKO

100CrMnMoSi8-4-6 All

General Information

Ovako 827 is a through hardening bearing steel that is mainly used for medium sized bearing rings, but it can also be used for machine components that require high tensile strength, hardness and toughness.

827B - Bearing quality (BQ) variant

- Through hardenability corresponding to a ring with approximately 75mm wall thickness (≈Ø130mm bar), quenched in oil
- Suitable for martensitic or banitic hardening
- Good machinability in soft annealed condition
- Good dimensional stability

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

ASTM A485 grade B8

Chemical composition

Variant	Cast		C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %
827B	IC	Min	0.93	0.40	0.90	-	0.003	1.85	-	0.50
		Max	0.98	0.60	1.10	0.025	0.008	2.05	0.25	0.60
EN ISO 683-17	Std	Min	0.93	0.40	0.80	-	-	1.80	-	0.50
		Max	1.05	0.60	1.10	0.025	0.015	2.05	-	0.60

Mechanical Properties

Variant	Condition	Format	Dimension [mm]	Yield strength min [MPa]	Tensile strength [MPa]	Hardness
827B	+SA	All formats	30 < 190	-	-	220 HB typical
	+Q/T(m)	Ring, wall	< 75	1700	2300 typical	61 HRC typical
	+Q/T(b)	Ring, wall	< 75	2000	2200 typical	59 HRC typical

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

Transformation temperatures

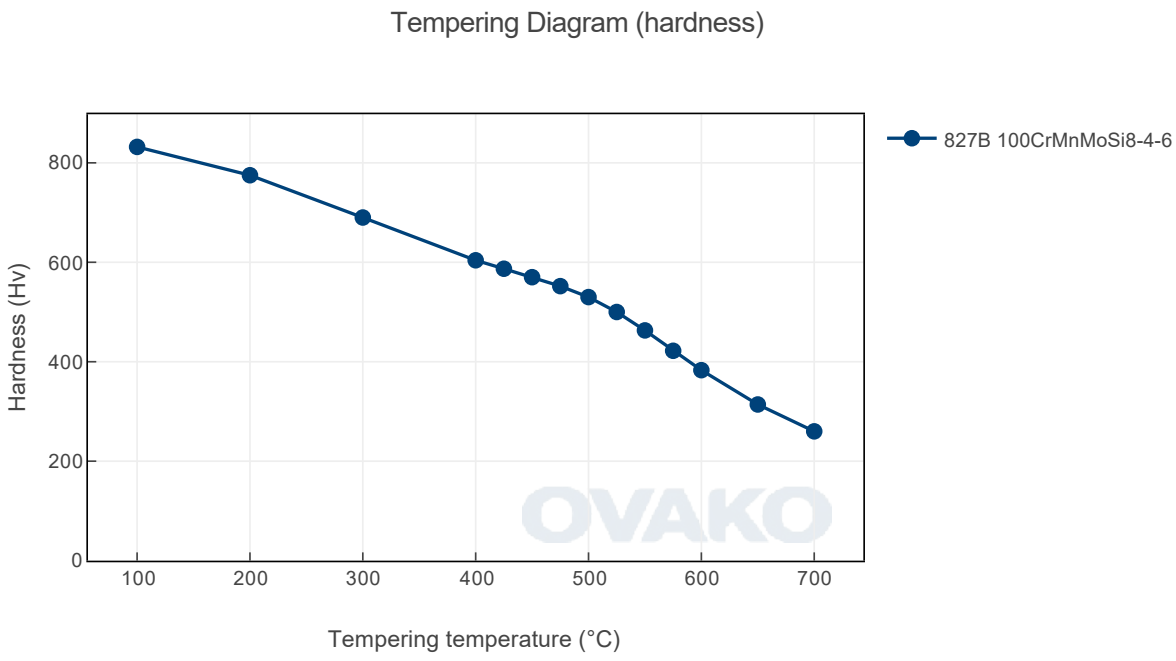
	Temperature °C
MS	233
AC1	750
AC3	750

Heat treatment recommendations

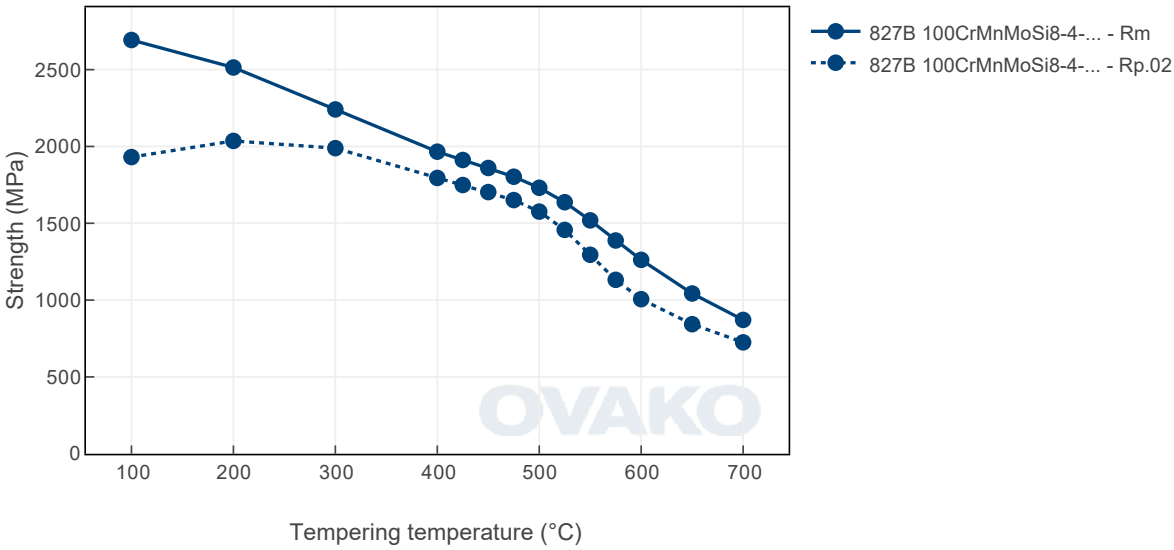
Treatment	Condition	Temperature cycle	Cooling/quenching
Hot forging	+U	850-1100C	In air
Normalizing	+N	880-910C	In air
Spheroidize annealing	+SA	*Normalizing is recommended prior to Soft Annealing, RT-820C 1-2h, 820C 2-5 h, 820-740C 1h, 740-690C 16h	In air
Stress relieve annealing	+SRA	550-650C 2h	In air
Q/T (martensite)	+Q/T(m)	830-880C 20-60min	In oil (temper within 2h)
Q/T (bainite)	+Q/T(b)	850-880C 20-60min	Salt bath 220-250C 10-20h (see diagram)
Tempering	+T	160-500C 1-3h	In air

Heat Treatment Guide generated Graphs

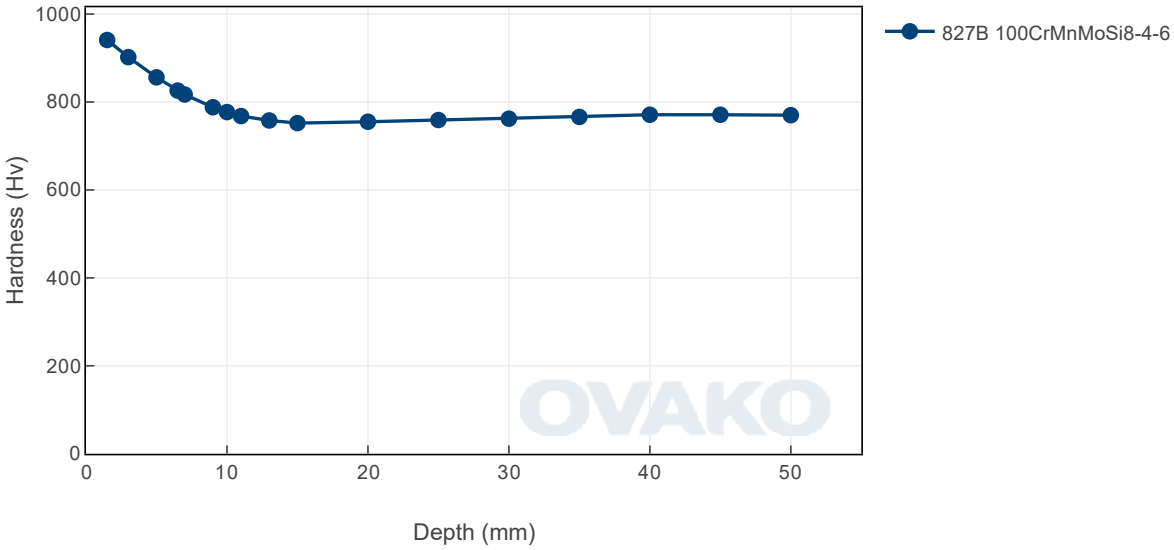
The following graphs are generated from a theoretical model. For further info see the Heat treatment guide module. Select a specific grade version for individual display.



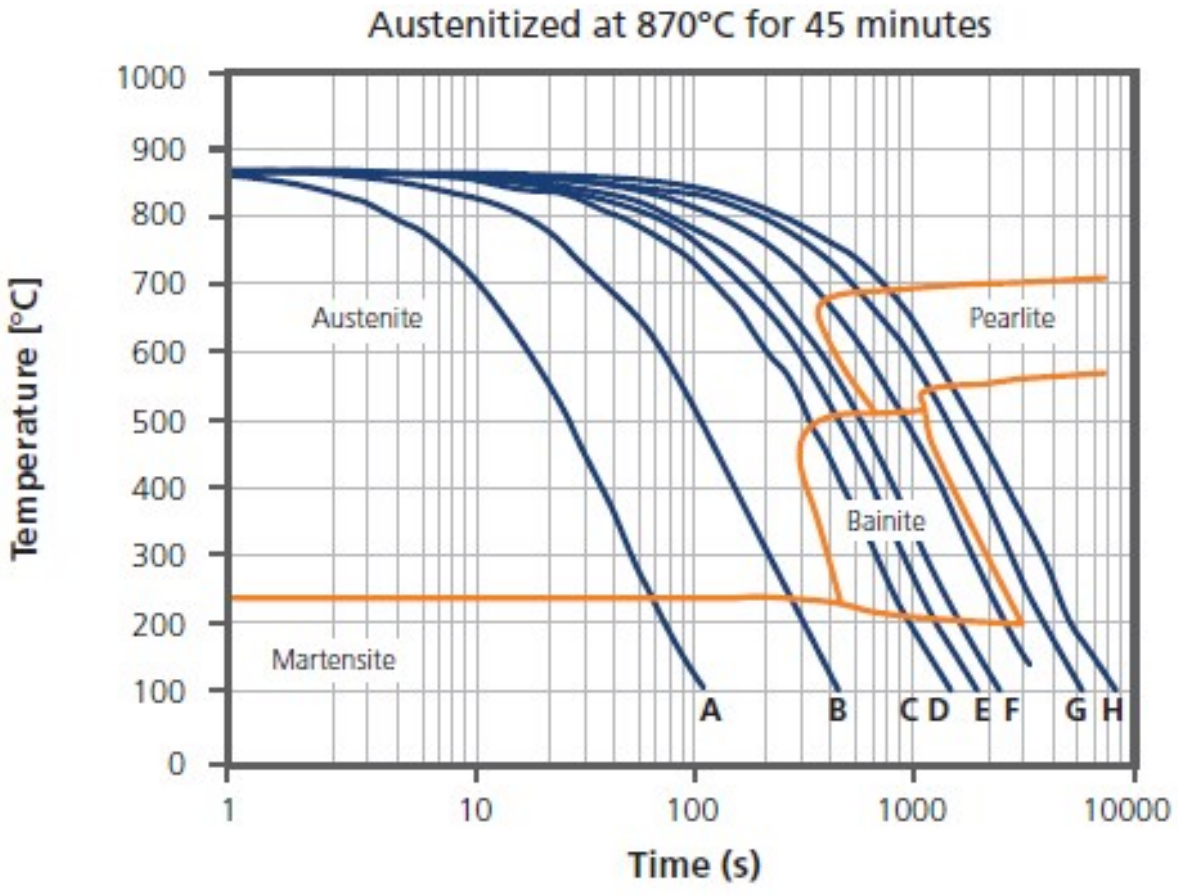
Tempering Diagram (strength)



Jominy

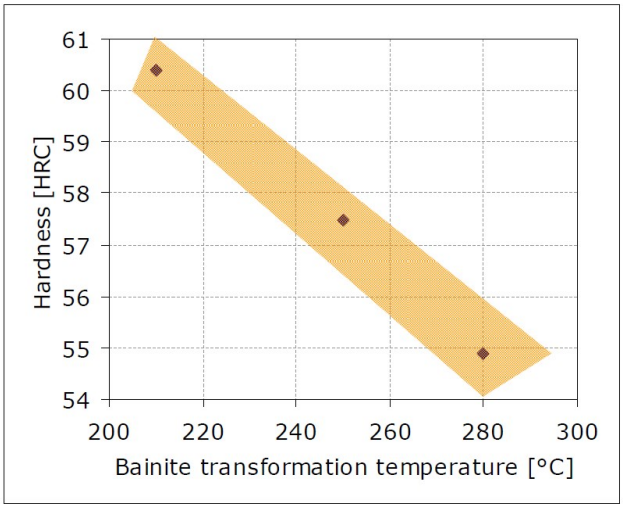

1000
800
600
400
200
0
Hardness (Hv)
0
10
20
30
40
50
Depth (mm)
827B 100CrMnMoSi8-4-6
OVAKO

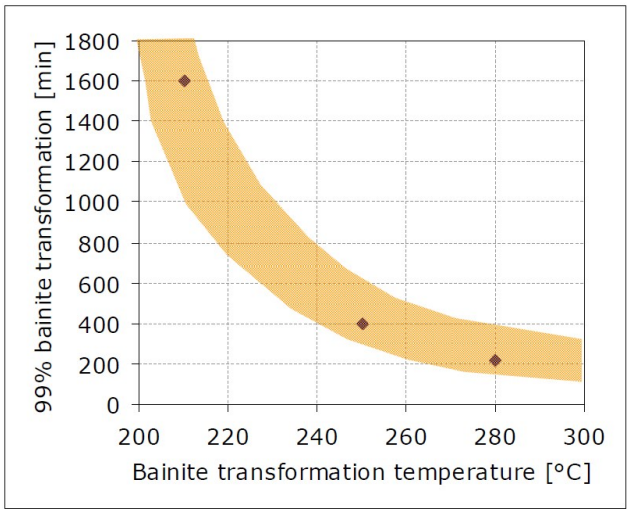
CCT



	A	B	C	D	E	F	G	H
t_{8-5} [s]	25	100	300	400	500	800	1200	1600
Hv_{30}	862	856	726	706	533	463	423	392

Bainite transformation





Steel cleanliness

Micro inclusions - Ovako 827B									Macro inclusions - Ovako 827B	
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)
827B	Round bar	+SA	685	284
827B	Tube,wall	+SA	712	314

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/

material. Other material, covering the same international specifications, does not necessarily comply with the properties presented in this document.