

# 100CrMnSi4-4 All

## General Information

Ovako 831 is a through hardening bearing steel that is mainly used for medium sized martensitic hardened bearing components, but it can also be used for machine components that require high tensile strength and high hardness. Ovako 831 has a controlled Ni and Mo content for enhanced and consistent hardenability.

831B - Bearing quality (BQ) variant

- Through hardenability corresponding to a ring with approximately 20mm wall thickness (~Ø35mm bar)
- Can be induction or flame hardened
- Good machinability in soft annealed condition
- Very good dimensional stability

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

## BQ-Steel®

(Bearing Quality) is a bearing quality clean steel optimized for fatigue strength by a strict control of steel cleanliness. BQ-steel is also ideal for new design solutions in a wide array of demanding applications outside the bearing industry that require longer performance and higher loads. The BQ-steel offer is the result of the Ovako clean steel program. Purity of production means that the material has significantly smaller inclusions compared to conventional steel and, as a result, the fatigue strength of the steel is increased dramatically. Use of the material allows components to be manufactured in smaller sizes. The BQ-steel has for decades been the problem-solver.

## Similar designations

A485 (B2)

## Chemical composition

Variant	Cast		C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %
831B	IC	Mn	0.92	0.50	1.05	-	0.005	1.00	0.10	0.06
		Max	1.02	0.70	1.20	0.015	0.015	1.15	0.25	0.10

## Mechanical Properties

Variant	Condition	Format	Dimension [mm]	Yield strength min [MPa]	Tensile strength [MPa]	Elongation A <sub>5</sub> [%]	Hardness
831B	+SA	All formats	24 < 190	480	720 typical	28	210 HB typical

*R<sub>p0,2</sub> \* R<sub>eh</sub>, \*\* R<sub>el</sub>*

## Transformation temperatures

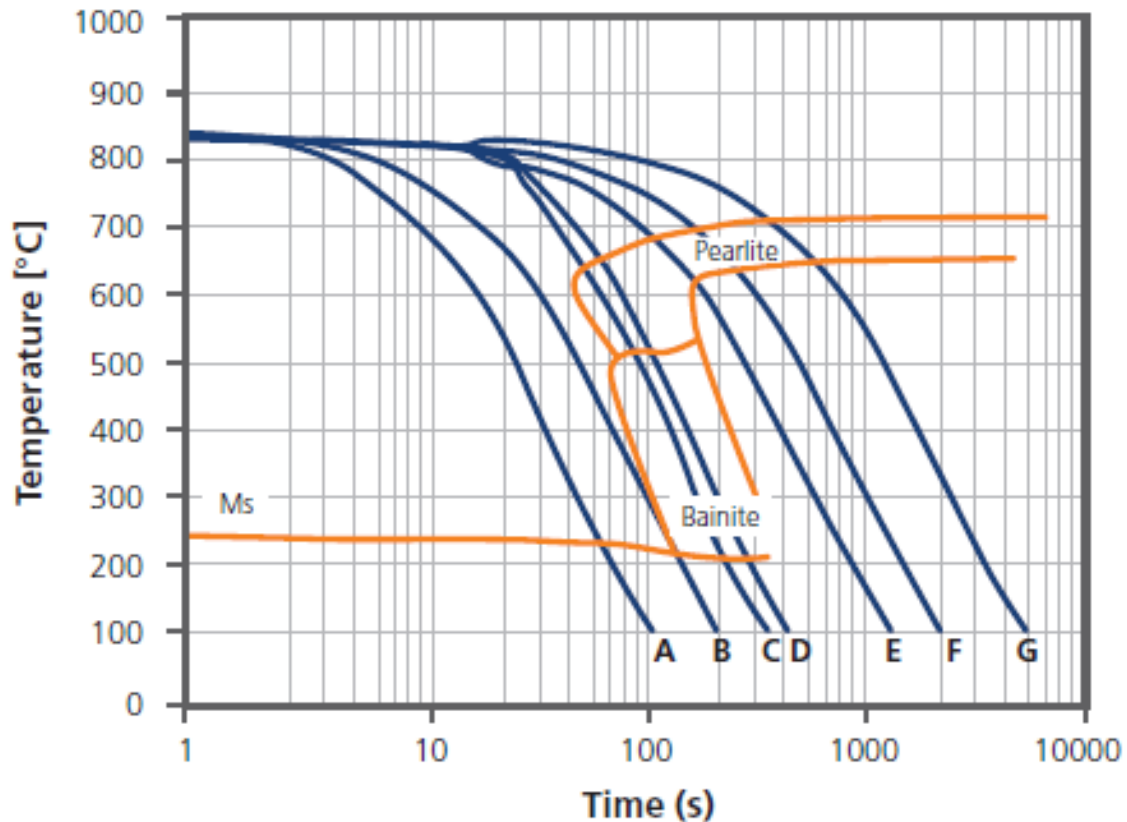
	Temperature °C
MS	236
AC1	750
AC3	750

## Heat treatment recommendations

Treatment	Condition	Temperature cycle	Cooling/quenching
Hot forging	+U	800-1100°C	In air
Spheroidize annealing	+SA	RT-810°C 1h, 810°C 2h, 810-740°C 1h, 740-650°C 10h	In air
QT (martensite)	+QT(m)	830-870°C 10-60min	In oil ( temper within 2h )
Tempering	+T	160-500°C	In air

## CCT – Ovako 831B

Austenitized at 830°C



### CCT data

	A	B	C	D	E	F	G
$t_{8-5}$ [s]	25	50	80	100	300	500	1200
HV <sub>30</sub>	852	837	602	486	334	314	313

### Other properties (typical values)

Youngs module (GPa)	Poisson's ratio (-)	Shear module (GPa)	Density (kg/m <sup>3</sup> )
210	0.3	80	7800
Average CTE 20-300°C (μm/m°C)	Specific heat capacity 50/100°C (J/kg°C)	Thermal conductivity Ambient temperature (W/m°C)	Electrical resistivity Ambient 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](mailto:info@ovako.com)

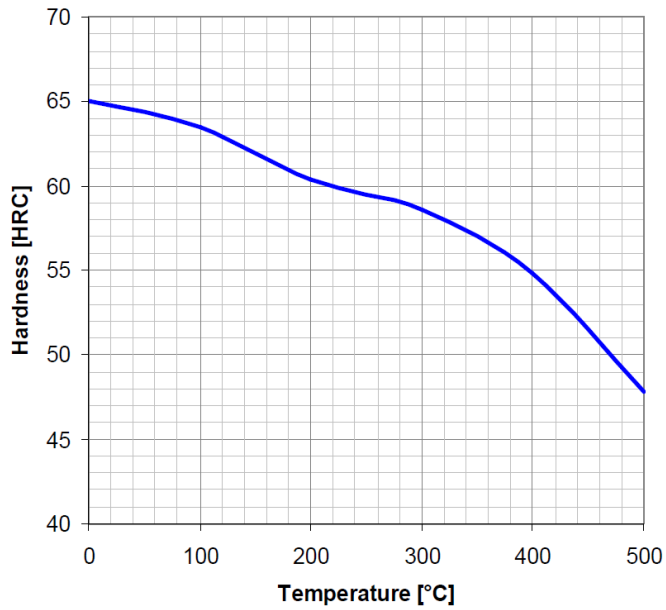
Via telephone: +46 8 622 1300

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

### Disclaimer

*The information in this document is for illustrative purposes only. The data and examples are only general recommendations and not a warranty or a guarantee. The suitability of a product for a specific application can be confirmed only by Ovako once given the actual conditions. The purchaser of an Ovako product has the responsibility to ascertain and control the applicability of the products before*

## Tempering response



Tempering response for Ovako 831B. Austenitized at 830°C for 20 min and quenched in oil. Tempered one hour at each tested temperature level

## Steel cleanliness

Micro inclusions - Ovako 831B								Macro inclusions - Ovako 831B	
Applied standard	ASTME45							Applied standard	ISO 3763 (Blue fracture)
Sampling	ASTMA295							Sampling	Statistical testing on billets
Maximum average limits	A		B		C		D		
	Th	He	Th	He	Th	He	Th	He	
	2,0	1,5	0,5	0,1	0	0	0,2	0,1	
Limits								Limits	< 2,5 mm/dm <sup>2</sup>

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