

## 39MnCrB6-2 All

### General Information

EN 10083-3 is one of the standards met by this steel grade.

This grade is classified as a WR-steel, which stands for wear-resistant steel. This group of steel includes a broad range of grades with a wide range of hardness levels 350 – 650 HV, dimensions and steel grades designed to give you a wear-resistant advantage when making product exposed to a high degree of wear and where service life is important. WR-steels are characterised by consistent properties and cost effectiveness due to optimized alloy content for different end applications.

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### Similar designations

1.7189

### Chemical composition

| Variant | Cast |     | C %  | Si % | Mn % | P %   | S %   | Cr % | B %    |
|---------|------|-----|------|------|------|-------|-------|------|--------|
| BCM414  | CC   | Min | 0.36 | 0.15 | 1.30 | -     | -     | 0.30 | 0.0008 |
|         |      | Max | 0.42 | 0.35 | 1.70 | 0.035 | 0.035 | 0.60 | 0.0050 |

Mechanical Properties

| Variant | <div><div></div><div>Condition</div></div> | Format    | Dimension [mm] | Yield strength min [MPa] | Tensile strength [MPa] | Elongation A <sub>5</sub> [%] | Reduction of area Z <sub>min</sub> [%] | Hardness  | Impact (ISO-V) strength <sub>min</sub> |
|---------|--------------------------------------------|-----------|----------------|--------------------------|------------------------|-------------------------------|----------------------------------------|-----------|----------------------------------------|
| BCM414  | +QT                                        | Round bar | 30 < 70        | 1150                     | 1350-1550              | 9                             | 45                                     | 43-48 HRC | 20 °C 20 J (long)                      |

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

Transformation temperatures

|     | Temperature °C |
|-----|----------------|
| MS  | 350            |
| AC1 | 720            |
| AC3 | 805            |

Heat treatment recommendations

| Treatment      | <div><div></div><div>Condition</div></div> | Temperature cycle                          | Cooling/quenching               |
|----------------|--------------------------------------------|--------------------------------------------|---------------------------------|
| Soft annealing | +AR                                        | Soft annealing 650 - 700°C soaking 3-10hrs | Followed by slow cooling in air |
| Normalizing    | +AR                                        | 840 - 870°C 1-2 hrs                        | In air                          |
| Hardening      | +AR                                        | Soaking at 840 - 870°C                     | Quenching in oil                |
| Tempering      | +QO                                        | Tempering 180 - 230°C 1hr at temperature   | In air                          |

## 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](#).

In many international comparisons the crude steel Scope 1-2 emission is a key parameter, ie. the CO<sub>2</sub> emission from the steel works itself.

As of 1 January 2022 we carbon offset all our scope 1 and 2 volume shown below.

| Steel works          | Hofors | Smedjebacken | Imatra |
|----------------------|--------|--------------|--------|
| CO <sub>2</sub> e/kg | 120    | 62           | 76     |

To get the full picture of our products environmental impact we have to look at all of our CO<sub>2</sub> 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.

As of 1 January 2022 we use carbon offset for all our scope 1- 2 emissions, so in practice the climate compensated data is the same as the full Scope 3 level.

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/m <sup>3</sup> )                     |
|-------------------------------|------------------------------------------|--------------------------------------------------|--------------------------------------------------|
| 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 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

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