General information

Steel grade 30MnB5 in accordance with DIN EN 10083-3 is one of the boron-alloyed quenched and tempered steels. These grades are characterized in particular by their formability in the hot rolled state and their high strength after the heat treatment. The strength characteristics after quenching and tempering are achieved in particular by the low boron content, in addition to the carbon and manganese. SZFG is currently delivering manganese-boron steels from 10MnB5 to 40MnB5.

Chemical composition (1)(2)

<table>
<thead>
<tr>
<th></th>
<th>min. in %</th>
<th>max. in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.27</td>
<td>0.33</td>
</tr>
<tr>
<td>Si</td>
<td>0.15</td>
<td>0.35</td>
</tr>
<tr>
<td>Mn</td>
<td>1.15</td>
<td>1.45</td>
</tr>
<tr>
<td>P</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>0.007</td>
<td></td>
</tr>
<tr>
<td>Cr</td>
<td>0.05</td>
<td>0.25</td>
</tr>
<tr>
<td>Ti</td>
<td>0.010</td>
<td>0.045</td>
</tr>
<tr>
<td>B</td>
<td>0.0010</td>
<td>0.0050</td>
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</tbody>
</table>

1) Heat analysis
2) Deviating promises may be possible by arrangement.

Available dimensions

- Hot-rolled coils unpickled, mill edge
  - Thickness in mm Width in mm
    - 2.00 – 2.24: 900 – 1,300
    - 2.25 – 2.99: 900 – 1,350
    - 3.00 – 3.99: 900 – 1,550
    - 4.00 – 12.70: 900 – 1,680
  - Widths up to 1,880 mm on request.

- Hot-rolled coils pickled, mill edge
  - Thickness in mm Width in mm
    - 2.00 – 2.24: 900 – 1,300
    - 2.25 – 2.99: 900 – 1,350
    - 3.00 – 3.99: 900 – 1,550
    - 4.00 – 5.99: 900 – 1,650
    - 6.00 – 9.99: 900 – 1,550
    - 10.00 – 10.99: 900 – 1,500
    - 11.00 – 11.99: 900 – 1,350
    - 12.00 – 12.49: 900 – 1,200
  - Widths up to 1,880 mm on request.

- Hot-rolled coils pickled, trimmed edge
  - Thickness in mm Width in mm
    - 2.00 – 2.24: 900 – 1,280
    - 2.25 – 2.99: 900 – 1,330
    - 3.00 – 3.99: 900 – 1,530
    - 4.00 – 6.00: 900 – 1,660
  - Widths up to 1,880 mm on request.

- Hot-rolled slit strip
  - Thickness in mm Width in mm
    - 2.00 – 2.99: 100 – 640
    - 3.00 – 4.60: 100 – 690
    - 4.61 – 6.00: 140 – 740
  - Widths ≤ 100 mm on request.
Microstructure
In the hot-rolled state, the 30MnB5 typically exhibits a ferritic-pearlitic microstructure with a typical grain size of > 9 according to ASTM.

Example applications
Thanks to the combination of ductility and hardness, the 30MnB5 is particularly used for supporting body parts and safety-relevant parts in the automotive industry, such as chassis components, stabilizers or bumpers, and also for agricultural products.

Press-hardening
Press-hardening helps combine the hot forming and hardening procedures in one process step. In press-hardening, the steel’s microstructure is first transferred into the austenitic range and formed by heating at more than 950° C in a protective atmosphere. While still in the mold, the pressed part is cooled to temperatures between 100° C and 200° C. This leads to the formation of a martensitic microstructure, which results in a high strength component.
**Welding**

The manganese-boron steels are suitable for welding with all known welding procedures, either by hand or with automatic systems. Resistance spot welding, gas-shielded welding and laser beam welding are particularly applicable. The steels are also suitable for welding in mixed joints with other common steel grades and in different thicknesses. The quality of the welded joint, however, depends on the welding procedure, the welding conditions and the selection of the correct filler materials.

In addition, it must be noted that when welding these steels in the quenched and tempered state, tempering effects can occur in the joining zone. This can reduce the strength of the joint compared to the base material that was strongly solidified by the preceding hot-forming process.

**Characteristics in the hardened state**

<table>
<thead>
<tr>
<th>Steel Grade</th>
<th>Water Hardening, Tempered at 300°</th>
<th>Oil-hardening, Tempered at 300°</th>
<th>Water Hardening, Tempered at 500°</th>
<th>Oil-hardening, Tempered at 500°</th>
</tr>
</thead>
<tbody>
<tr>
<td>22MnB5</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
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<td>34MnB5</td>
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