20MnB4

General Information

Grade SB21M10B is a boron steel for general purposes without any specified mechanical properties. Its closest equivalent is found in the EN 10263-4:2001 grade 20MnB4 but with a difference in boron and manganese content. SB21M10B is suitable for use in pegs, chains, simple wear parts and machinery parts as cogwheels and axles in dimensions up to Ø30 mm or equivalent thickness.

Similar designations

SB21M10B - 20MnB4-3, 20MnB5

Chemical composition

<table>
<thead>
<tr>
<th>Variant</th>
<th>Cast</th>
<th>Weldability</th>
<th>C %</th>
<th>Si %</th>
<th>Mn %</th>
<th>P %</th>
<th>S %</th>
<th>Cr %</th>
<th>B %</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB21M10B</td>
<td>CC</td>
<td>CEV 0.43max</td>
<td>0.18</td>
<td>0.15</td>
<td>0.90</td>
<td>-</td>
<td>-</td>
<td>0.10</td>
<td>0.0010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pcm 0.3max</td>
<td>0.23</td>
<td>0.35</td>
<td>1.10</td>
<td>0.035</td>
<td>0.035</td>
<td>0.30</td>
<td>0.0060</td>
</tr>
<tr>
<td>20MnB4 EN 10263-4:2001</td>
<td>Std</td>
<td>CEV 0.43max</td>
<td>0.18</td>
<td>0.15</td>
<td>0.90</td>
<td>-</td>
<td>-</td>
<td>0.10</td>
<td>0.0008</td>
</tr>
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<td></td>
<td></td>
<td>Pcm 0.3max</td>
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<td>0.35</td>
<td>1.20</td>
<td>0.035</td>
<td>0.035</td>
<td>0.30</td>
<td>0.0050</td>
</tr>
</tbody>
</table>

Mechanical Properties

Transformation temperatures

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Condition</th>
<th>Temperature °C</th>
<th>Cooling/quenching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quenching</td>
<td>+Q</td>
<td>900 - 920 °C</td>
<td>water</td>
</tr>
<tr>
<td>Tempering</td>
<td>none or at 200 °C for maximum hardness</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Heat treatment recommendations
Hardenability

Distance [mm] vs Hardness [HB]

SB21M10B  20MnB4 EN10263-4:2001

Other properties (typical values)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youngs modulus (GPa)</td>
<td>210</td>
</tr>
<tr>
<td>Poisson’s ratio (-)</td>
<td>0.3</td>
</tr>
<tr>
<td>Shear modulus (GPa)</td>
<td>80</td>
</tr>
<tr>
<td>Density (kg/m³)</td>
<td>7800</td>
</tr>
<tr>
<td>Average CTE 20-300°C (µm/m°C)</td>
<td>12</td>
</tr>
<tr>
<td>Specific heat capacity 50/100°C (J/kg°C)</td>
<td>460 - 480</td>
</tr>
<tr>
<td>Thermal conductivity Ambient temperature (W/m°C)</td>
<td>40 - 45</td>
</tr>
<tr>
<td>Electrical resistivity Ambient temperature (µΩm)</td>
<td>0.20 - 0.25</td>
</tr>
</tbody>
</table>

Contact us

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