MFR x 5 Sonder (HQ)

No. 1.2738.02 (VAR)  

Typical chemical composition, %  

<table>
<thead>
<tr>
<th>Element</th>
<th>C</th>
<th>Mn</th>
<th>Cr</th>
<th>Mo</th>
<th>Ni</th>
<th>V</th>
<th>S max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>HV 10</td>
<td>0.25</td>
<td>1.45</td>
<td>1.30</td>
<td>0.60</td>
<td>1.10</td>
<td>0.10</td>
<td>0.005</td>
</tr>
</tbody>
</table>

PROPERTIES AND USES

- MFR x 5 Sonder is especially suitable for large parts (e.g. compression and/or injection molds)
- Good polishability
- Good weldability
- Nitridable
- Homogenenous hardnes up to center area
- As-delivered condition 310–350 HB

MFR x 5 Sonder (HQ) produced by VAR (Vacuum Arc Remelting) shows an excellent cleanliness and an extremely low segregation level of the material, which lead to a supreme polishability and best texturing properties.

HOT WORKING AND HEAT TREATMENT

**Forging**  
1150–850 °C (2100–1560 °F)

**Soft annealing**  
710–740 °C (1310–1360 °F)

**Brinell Hardness in the annealed condition**  
Max. 240 HB

**Working hardness in the quenched and tempered condition**  
310–350 HB

**Stress relieving**  
In the quenched and tempered condition: ~ 560 °C (1040 °F) 1 hr/50 mm wall thickness  
In the annealed condition: ~ 600 °C (1110 °F) 1 hr/50 mm wall thickness

**Hardening**  
850–880 °C (1560–1620 °F)

**Quenching**  
Air / oil / water

**Tempering**  
To service hardness 1 hr/25 mm wall thickness

**Reference values for annealing**

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Rockwell hardness C (HV 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>50 HRC</td>
</tr>
<tr>
<td>300</td>
<td>48 HRC</td>
</tr>
<tr>
<td>400</td>
<td>47 HRC</td>
</tr>
<tr>
<td>500</td>
<td>44 HRC</td>
</tr>
<tr>
<td>550</td>
<td>41 HRC</td>
</tr>
<tr>
<td>600</td>
<td>37 HRC</td>
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</table>

CONTINUOUS TTT CURVE

TEMPERING CURVE (APPROX. VALUES)