Firmodur 6582

TECHNICAL DATA SHEET
34CrNiMo6
1.6582

QUENCHED AND TEMPERED STEEL

CHEMICAL COMPOSITION (IN WEIGHT-% ACCORDING TO DIN EN 10083-3)

<table>
<thead>
<tr>
<th>C</th>
<th>Si</th>
<th>Mn</th>
<th>P</th>
<th>S</th>
<th>Cr</th>
<th>Ni</th>
<th>Mo</th>
</tr>
</thead>
<tbody>
<tr>
<td>min.</td>
<td>0.3</td>
<td>-</td>
<td>0.5</td>
<td>-</td>
<td>1.3</td>
<td>1.3</td>
<td>0.15</td>
</tr>
<tr>
<td>max.</td>
<td>0.38</td>
<td>0.4</td>
<td>0.8</td>
<td>0.025</td>
<td>0.035</td>
<td>1.7</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Customer specific limitations of standard analysis are possible after consultation with the Deutsche Edelstahlwerke.

APPLICATIONS

Firmodur 6582 is used for through-hardened components such as fasteners in the automotive and mechanical engineering industry with high demands on strength and toughness.

STANDARDS AND DESIGNATIONS

- DIN EN 10083-3 1.6582 34CrNiMo6
- DIN EN 10263-4 1.6582 34CrNiMo6
- B.S. 816M40 817M40
- AFNOR 34CrNiMo8 35NCD6
- UNI 35NiCrMo6KB
- JIS SNCM447
- SS 2541
- GOST 38Ch2N2MA
- DIN EN ISO 683-1 36CrNiMo6
- AISI / SAE / ASTM 4337 / 4340

PHYSICAL PROPERTIES

- Density in kg/dm³ 7.73
- Young's modulus in GPa 210
- Electrical resistivity at 20°C in (Ω mm²)/m 0.19
- Thermal conductivity at 20°C in W/(m K) 42.6
- Specific heat capacity at 20°C in J/(kg K) 470
- Thermal expansion coefficient in soft annealed condition in 10⁻⁶ K⁻¹
  - 20°C - 100°C 11.1
  - 20°C - 200°C 12.1
  - 20°C - 300°C 12.9
  - 20°C - 400°C 13.5

DELIVERY CONDITION

- Quenched and tempered 700 – 1,400 MPa
- Soft annealed (+A) max. 248 HB
MECHANICAL PROPERTIES IN QUENCHED AND TEMPERED CONDITION
AT ROOMTEMPERATURE (+QT) ACCORDING TO DIN EN 10083-3

<table>
<thead>
<tr>
<th>d in mm</th>
<th>Yield strength in MPa</th>
<th>Tensile strength in MPa</th>
<th>Elongation ((L_0 = 5 \ d_0)) in %</th>
<th>Reduction of area in %</th>
<th>Notch impact energy ISO - V in J</th>
</tr>
</thead>
<tbody>
<tr>
<td>d ≤ 16</td>
<td>≥ 1,000</td>
<td>1,200 – 1,400</td>
<td>≥ 9</td>
<td>≥ 40</td>
<td>-</td>
</tr>
<tr>
<td>16 &lt; d ≤ 40</td>
<td>≥ 900</td>
<td>1,100 – 1,300</td>
<td>≥ 10</td>
<td>≥ 45</td>
<td>≥ 45</td>
</tr>
<tr>
<td>40 &lt; d ≤ 100</td>
<td>≥ 800</td>
<td>1,000 – 1,200</td>
<td>≥ 11</td>
<td>≥ 50</td>
<td>≥ 45</td>
</tr>
<tr>
<td>100 &lt; d ≤ 160</td>
<td>≥ 700</td>
<td>900 – 1,100</td>
<td>≥ 12</td>
<td>≥ 55</td>
<td>≥ 45</td>
</tr>
<tr>
<td>160 &lt; d ≤ 250</td>
<td>≥ 600</td>
<td>800 – 950</td>
<td>≥ 13</td>
<td>≥ 55</td>
<td>≥ 45</td>
</tr>
</tbody>
</table>

The sampling for the tests is carried out according to DIN EN 10083-1. Deviating requirements can be considered on request.

WELDING
Firmodur 6582 is difficult to weld and should therefore not be used in welded constructions.

HOT FORMING
The temperature range for hot forming of Firmodur 6582 is 1,000°C - 850°C. The material has to be cooled in the furnace down slowly.

HEAT TREATMENT

<table>
<thead>
<tr>
<th>Temperature in °C</th>
<th>Cooling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normalizing (+N)</td>
<td>850 - 880</td>
</tr>
<tr>
<td>Soft annealing (+A)</td>
<td>650 - 700</td>
</tr>
<tr>
<td>Quenched and tempered (+QT)</td>
<td>830 - 860</td>
</tr>
<tr>
<td>» Hardening</td>
<td>540 - 680</td>
</tr>
<tr>
<td>» Tempering</td>
<td></td>
</tr>
</tbody>
</table>
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TIME-TEMPERATURE-TRANSFORMATION DIAGRAM

<table>
<thead>
<tr>
<th>C</th>
<th>Si</th>
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<th>S</th>
<th>Cr</th>
<th>Ni</th>
<th>Mo</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.34</td>
<td>0.29</td>
<td>0.59</td>
<td>0.012</td>
<td>0.007</td>
<td>1.54</td>
<td>1.52</td>
<td>0.24</td>
</tr>
</tbody>
</table>

Temperature in °C

Hardness values in HV

Ac₃ = 760°C
Ac₁ = 695°C

Member of Swiss Steel Group
HARDENABILITY SCATTER BAND

TEMPERING DIAGRAM

Hardening temperature 850°C
Cross section of the specimen Ø 60 mm
Samples conventionally hardened
in high performance oil

LIEFERMÖGLICHKEITEN

You can find our complete programme in the brochure "High-tech Steel Solutions for tomorrow’s World (Products and Services)" on www.dew-stahl.com.

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