BÖHLER Ti 46 T-FD
Seamless Cored Wire

Low hydrogen all-positional seamless rutile flux cored wire for welding carbon-manganese and fine grain steels using Argon-CO₂ or pure CO₂ shielding gas

<table>
<thead>
<tr>
<th>Product features</th>
<th>Product benefits</th>
<th>User benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Seamless design</td>
<td>» Ultra-low-hydrogen weld metal</td>
<td>» Optimal protection against hydrogen cracking</td>
</tr>
<tr>
<td>» Extremely clean manufacturing</td>
<td>» Total resistance against moisture absorption during storage and use</td>
<td>» No porosities observed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>» Faster painting process</td>
</tr>
<tr>
<td>» Fast freezing rutile slag</td>
<td>» Enhancing travel speed and arc stability in positional welding</td>
<td>» Productive positional welding</td>
</tr>
<tr>
<td>system</td>
<td></td>
<td>» Automatic slag detachability</td>
</tr>
<tr>
<td>» Wide parameter window</td>
<td>» More spray arc welding</td>
<td>» Easy arc setting</td>
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<tr>
<td></td>
<td></td>
<td>» Easy welding in overhead position</td>
</tr>
<tr>
<td>» Excellent feedability</td>
<td>» Low contact tip wear</td>
<td>» Less down-time for maintenance</td>
</tr>
<tr>
<td></td>
<td>» Trustable performance with long welding cable</td>
<td>» No wire breaks</td>
</tr>
<tr>
<td>» Stable arc</td>
<td>» Low spatter</td>
<td>» Less post-weld cleaning</td>
</tr>
<tr>
<td>» Sharp arc</td>
<td>» Good weldability</td>
<td>» Very flat root pass</td>
</tr>
<tr>
<td></td>
<td>» Good wetting</td>
<td>» No undercut</td>
</tr>
<tr>
<td>» Copper coated</td>
<td>» Excellent current transfer</td>
<td>» Easy handling</td>
</tr>
<tr>
<td></td>
<td>» Rust resistance</td>
<td>» Safer storage</td>
</tr>
<tr>
<td>» Designed chemistry</td>
<td>» Excellent CVN impact toughness down to -30°C mix gas and to -20°C in pure CO₂</td>
<td>» Wide margin to cover both strength and CVN impact requirements</td>
</tr>
<tr>
<td></td>
<td>» Highest welding performance in welding travel speed in particular in PF position</td>
<td>» Faster weld execution</td>
</tr>
<tr>
<td></td>
<td>» Low fume emission</td>
<td>» Healthy working place</td>
</tr>
</tbody>
</table>

BÖHLER Ti 46 T-FD is a new seamless tubular FCW, copper-coated and developed for modern shipyard requirements and daily construction challenges. The wire has excellent weldability, productivity for welding of low and medium alloyed steels using Argon-CO₂ shielding gas or pure CO₂. The weld deposit has excellent mechanical properties till -30°C in mix gas and till -20°C in pure CO₂ shielding gas. BÖHLER Ti 46 T-FD is approved with both shielding gases in the grade 3YSH5 and the hydrogen level guarantee is below 4 ml/100 g, tested at 27°C, 80%HR for 12 weeks without any increase.

Typical applications
» General construction
» Shipbuilding
BÖHLER Ti 46 T-FD

### Classifications

<table>
<thead>
<tr>
<th>EN ISO 17632-A</th>
<th>AWS A5.36</th>
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<tbody>
<tr>
<td>T46 3 P M21 1 H5 - T42 2 P C1 1 H5</td>
<td>E71T1-M21A2-CS2-H4- E71T1-C1A0-CS2-H4</td>
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</tbody>
</table>

### Operating data

<table>
<thead>
<tr>
<th>Welding positions</th>
<th>Polarity</th>
<th>Shielding gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC+</td>
<td>EN ISO 14175: M21-C1</td>
<td></td>
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</tbody>
</table>

### Typical analysis of all weld metal, wt. %

<table>
<thead>
<tr>
<th>Shielding gas</th>
<th>C</th>
<th>Si</th>
<th>Mn</th>
</tr>
</thead>
<tbody>
<tr>
<td>M21</td>
<td>0.06</td>
<td>0.45</td>
<td>1.30</td>
</tr>
<tr>
<td>C1</td>
<td>0.05</td>
<td>0.35</td>
<td>1.20</td>
</tr>
</tbody>
</table>

### Mechanical properties, all weld metal (single values typical)

<table>
<thead>
<tr>
<th>Shielding gas</th>
<th>Condition</th>
<th>Yield strength $R_{0.2%}$ MPa</th>
<th>Tensile strength $R_m$ MPa</th>
<th>Elongation $A (L_0 = 5d_0)$ %</th>
<th>CVN Impact toughness ISO-V KV J -20 °C</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>M21</td>
<td>As welded</td>
<td>530 (± 460)</td>
<td>590 (550 – 660)</td>
<td>24 (± 22)</td>
<td>90</td>
<td>70 (± 47)</td>
</tr>
<tr>
<td>C1</td>
<td>As welded</td>
<td>470 (± 420)</td>
<td>550 (500 – 640)</td>
<td>25 (± 22)</td>
<td>60</td>
<td>60 (± 47)</td>
</tr>
</tbody>
</table>

### Mechanical properties, PF position: S355J2-20 mm- V joint 60°

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<thead>
<tr>
<th>Shielding gas</th>
<th>Condition</th>
<th>Yield strength $R_{0.2%}$ MPa</th>
<th>Tensile strength $R_m$ MPa</th>
<th>Elongation $A (L_0 = 5d_0)$ %</th>
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<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>M21</td>
<td>As welded</td>
<td>509</td>
<td>569</td>
<td>29</td>
<td>80</td>
<td>62 out of weld</td>
</tr>
<tr>
<td>C1</td>
<td>As welded</td>
<td>452</td>
<td>543</td>
<td>30</td>
<td>90</td>
<td>60 out of weld</td>
</tr>
</tbody>
</table>

### Steels to be welded

<table>
<thead>
<tr>
<th>EN</th>
<th>Shipbuilding steel</th>
<th>ASTM</th>
</tr>
</thead>
</table>

### Approvals

TÜV; DB; ABS, BV, DNV-GL, LR, CE

### Overview spool types

#### Plastic spool D200

- Precision layer wound
- Dimensions: Ø external 200 mm, Ø internal 52 mm, Width 47 mm
- Available spool weight: 5 kg
- Available diameters: 1.0 mm, 1.2 mm

#### Wire basket spool BS300

- Precision layer wound
- Dimensions: Ø external 300 mm, Ø internal 52 mm, Width 100 mm
- Available spool weight: 16 kg
- Available diameters: 1.0 mm, 1.2 mm, 1.6 mm