Product Data

INVICTA
Forged High Speed Steel (HSS)

Chemical composition

<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th>Cr</th>
<th>Mo</th>
<th>V</th>
<th>W</th>
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<tbody>
<tr>
<td>INVICTA</td>
<td>0.8</td>
<td>8</td>
<td>0.5</td>
<td>0.5</td>
<td>0.2</td>
</tr>
<tr>
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<td>3.0</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Properties

- **Hardness**: HV 780-820
- **Residual stresses**: MPa -300/-400
- **Yield Strength (core)**: MPa 500-700
- **Young modulus**: GPa 210

Description

Forged high speed steel manufactured according to Union Electric Åkers proprietary specification.

The ingot obtained by electric arc furnace, ladle metallurgy and vacuum degassing is refined by ESR (Electro Slag Remelting).

The ingot is forged with high forging ratio. Preliminary heat treatments are applied on forged blanks to obtain suitable mechanical properties in the core and necks.

The roll barrel is then induction hardened and tempered to obtain a hard and wear resistant surface layer with very low residual stresses, the depth of which can be varied according to requirements by careful selection of the hardening parameters. Furthermore, constant properties are obtained throughout the useful layer. INVICTA rolls display significant secondary hardening that allows an increase in hardness at high temperatures and gives outstanding resistance to mill incidents.

Applications

Work roll cold strip mills: tandem and reversible mills.

Comparative properties

<table>
<thead>
<tr>
<th></th>
<th>Wear resistance</th>
<th>Roughness retention</th>
<th>Resistance to incidents</th>
<th>Campaign length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard*</td>
<td></td>
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<tr>
<td>INVICTA</td>
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</tr>
</tbody>
</table>

* : standard work roll 5% Cr

Note: Example of mill performance from industrial trials

Features & Benefits

- Suppression of chrome plating
- Excellent resistance to marks and thermal cracks
- Outstanding resistance to mill incidents
- Extended campaign length

Union Electric Åkers
www.uniones.com

These data are indicative and can be changed at any time without prior notice

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