FORGED ROLLS

SURFACE HARDENED ROLLS
DURALIFE EXTRA | DURALIFE SUPREME
SURFACE HARDENED ROLLS

For all types of rolling mills.

Our forged rolls withstand high pressure and are characterized by uniform hardness within +/- 0.5 HRC throughout the working barrel and a homogeneous steel microstructure. Hardness drop throughout the hardened layer is max. 3%.

Our own heat treatment facilities for optimal mechanical characteristics is available – optimal working hardness is guaranteed by a bi-frequency induction hardening machine, which was developed, designed, and produced in-house.

A highly advanced 3-D induction hardening machine (manually adjustable induction frequency) for the best mechanical characteristics of roll necks.

Cryogenic treatment – a step forward in the heat treatment hardening process, which completes the transformation of the steel microstructure from austenite to a stronger martensitic structure with greater hardness. Steel hardness increases by raising the percentage of martensite in the steel structure – hence, wear resistance increases as it correlates positively with hardness.

Surface hardened rolls are made from high-quality steels and in accordance with customer requirements.

MOST FREQUENTLY USED STEEL GRADES

<table>
<thead>
<tr>
<th>Ravne brand name</th>
<th>W.Nr.</th>
<th>DIN</th>
<th>Directional Chemical Composition (%)</th>
<th>Hardnes HRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIHARD 2327</td>
<td>1.2327</td>
<td>86CrMoV7</td>
<td>C: 0.85, Cr: 1.70, Mo: 0.30, V: 0.10</td>
<td>≤ 67</td>
</tr>
<tr>
<td>SIHARD 2375</td>
<td>1.2375</td>
<td>83CrMoV9</td>
<td>C: 0.88, Cr: 2.10, Mo: 0.25, V: 0.10</td>
<td>≤ 67</td>
</tr>
<tr>
<td>SIHARD R246</td>
<td>/</td>
<td>/</td>
<td>C: 0.80, Cr: 3.00, Mo: 0.50, V: 0.10</td>
<td>≤ 67</td>
</tr>
<tr>
<td>SIHARD R247</td>
<td>/</td>
<td>/</td>
<td>C: 0.80, Cr: 3.00, Mo: 0.40, V: 0.10</td>
<td>≤ 67</td>
</tr>
<tr>
<td>SIHARD R340</td>
<td>/</td>
<td>/</td>
<td>C: 0.80, Cr: 4.00, Mo: 0.50, V: 0.10</td>
<td>≤ 67</td>
</tr>
<tr>
<td>SIHARD R350</td>
<td>/</td>
<td>/</td>
<td>C: 0.80, Cr: 5.00, Mo: 0.50, V: 0.10</td>
<td>≤ 67</td>
</tr>
</tbody>
</table>

Comparison of the main properties:

- WEAR RESISTANCE
- HARDENING LAYER
- TOUGHNESS

SIHARD R246

SIHARD R247

SIHARD R350
The DURALIFE family of rolls is the next generation of high-alloy rolls for cold rolling, with the brand names DURALIFE EXTRA (tool steel with 5% chromium content) and DURALIFE SUPREME (tool steel with 8% chromium content).

DURALIFE brand rolls have a longer life time, better resistance to wear and resistance to damage, and therefore longer campaigns. One of their many advantages is that, thanks to the higher levels of ferroalloys, they have longer roughness retention and chrome plating is not required.

### Chemical composition

**DURALIFE EXTRA**

<table>
<thead>
<tr>
<th>Element</th>
<th>C</th>
<th>Si</th>
<th>Mn</th>
<th>Cr</th>
<th>Mo</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.</td>
<td>0.50</td>
<td>0.50</td>
<td>0.20</td>
<td>5.00</td>
<td>1.00</td>
<td>0.20</td>
</tr>
<tr>
<td>Max.</td>
<td>1.00</td>
<td>1.50</td>
<td>1.00</td>
<td>5.50</td>
<td>2.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**DURALIFE SUPREME**

<table>
<thead>
<tr>
<th>Element</th>
<th>C</th>
<th>Si</th>
<th>Mn</th>
<th>Cr</th>
<th>Mo</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.</td>
<td>0.70</td>
<td>0.50</td>
<td>0.20</td>
<td>7.00</td>
<td>1.50</td>
<td>0.20</td>
</tr>
<tr>
<td>Max.</td>
<td>1.30</td>
<td>1.50</td>
<td>1.00</td>
<td>9.00</td>
<td>3.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**Production data**

- **Dimensional Range**: ≥ φ 100 - 600 mm
- **Melting Method**: (LF+VD)/ESR
- **Hardening Method**: Inductive
- **Tempering Temperature**: 450-550 °C, depends on the required hardness

**DURALIFE steels offer you the following benefits:**

- Extremely high wear resistance
- Lower grind offs
- Better tonnage in cycle
- Resistance to local overheating
- Extended surface roughness retention
- Outstanding resistance to mill incidents
- Extended campaign length

**Comparative properties**

<table>
<thead>
<tr>
<th>Standard*</th>
<th>DURALIFE EXTRA</th>
<th>DURALIFE SUPREME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear resistance</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>Hardening layer</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>Toughness</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>Campaign length</td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="Graph" /></td>
</tr>
</tbody>
</table>

* STANDARD 3-5% CR

**BETTER SOLUTIONS WITH LONGER LIFE TIME!**

Wide range of high-alloy rolls for cold rolling provides our customers with a definitive competitive advantage.
WHY SIJ RAVNE SYSTEMS?

Perfect quality, excellent service and the desire to build a long term partnership.

This is who we are – SIJ Ravne Systems, your reliable partner.

A unique combination of metallurgical and engineering know-how.

The highest product quality as a result of tight integration in a vertical supply chain, from steelmaking to the final product.

Rolls made from ultra-clean steel as a result of the ESR method.

Accredited in-house laboratories that perform a wide range of non-destructive tests, inspections and calibrations.

The ability to offer a complete package of products and services for the steel mills; from complete assembled equipment, subassemblies, components, spare parts and industrial knives for metal, to maintenance, reconstruction and revamping.

VERTICALLY INTEGRATED COMPANY

Brnik 26 km
Munich 414 km
Vienna 387 km
Graz 204 km
Budapest 462 km
Zagreb 142 km
Venice 245 km

From Ljubljana to Ravne na Koroškem

Laboratories
Maintenance
Company headquarters
Rolls, Machine building
Knives

Heat treatment

Productions facilities of SIJ Ravne Systems
Productions facilities of sister company, one of the best European high-speed tool steel and forging producers.