General Product Description
The all-around steel that resists wear and abrasion. Hardox 400 is an abrasion-resistant steel with a nominal hardness of 400 HBW. Hardox 400 is an all-around wear resistant steel. Thanks to its high toughness, good bendability and weldability, this steel can be used in structures with moderate wear.

Dimension Range
Hardox 400 Sheet is available in thicknesses between 2 - 8 mm. Hardox 400 Sheet is available in widths up to 1750 mm and lengths up to 16000 mm. More detailed information on dimensions is provided in the dimension program.

Mechanical Properties

<table>
<thead>
<tr>
<th>Thickness (mm)</th>
<th>Hardness 11 (HBW)</th>
<th>Typical yield strength (MPa), not guaranteed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.00 - 8.00</td>
<td>370 - 430</td>
<td>1100</td>
</tr>
</tbody>
</table>

11 Brinell hardness, HBW, according to EN ISO 6506-1, on a milled surface 0.5–3 mm below surface. At least one test specimen per heat and 40 tons.

Impact Properties

<table>
<thead>
<tr>
<th>Grade</th>
<th>Longitudinal test, typical impact energy, Charpy V 10 x10 mm test specimen 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardox 400 Sheet</td>
<td>45 J /-40 °C 22</td>
</tr>
</tbody>
</table>

11 For thicknesses between 6 - 11.9 mm, sub-size Charpy V-specimens are used. The specified minimum value is then proportional to the cross-sectional area of the test specimen, compared to a full-size specimen (10 x 10 mm). Impact testing according to ISO EN 148 per heat and thickness group. Average of three tests.

22 Single value minimum 70% of specified average. Impact testing is performed on thicknesses ≥ 6 mm.
HARDOX 400 SHEET

Chemical Composition (heat analysis)

<table>
<thead>
<tr>
<th>Element</th>
<th>C (max %)</th>
<th>Si (max %)</th>
<th>Mn (max %)</th>
<th>P (max %)</th>
<th>S (max %)</th>
<th>Cr (max %)</th>
<th>Ni (max %)</th>
<th>Mo (max %)</th>
<th>B (max %)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.32</td>
<td>0.70</td>
<td>1.60</td>
<td>0.025</td>
<td>0.010</td>
<td>1.40</td>
<td>1.50</td>
<td>0.60</td>
<td>0.004</td>
</tr>
</tbody>
</table>

The steel is grain refined. *) Intentional alloying elements.

Carbon Equivalent CET(CEV)

<table>
<thead>
<tr>
<th>Thickness (mm)</th>
<th>2.00 - 8.00 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max CET(CEV)</td>
<td>0.39 (0.52)</td>
</tr>
<tr>
<td>Typ CET(CEV)</td>
<td>0.30 (0.48)</td>
</tr>
</tbody>
</table>

\[
\text{CET} = C + \frac{\text{Mn} + \text{Mo}}{10} + \frac{\text{Cr} + \text{Cu}}{20} + \frac{\text{Ni}}{40}
\]

\[
\text{CEV} = C + \frac{\text{Mn}}{6} + \frac{\text{Cr} + \text{Mo} + \text{V}}{5} + \frac{\text{Cu} + \text{Ni}}{15}
\]

Tolerances

**Thickness**
Tolerances according to Hardox Thickness Guarantees. Hardox® Guarantees meets the requirements of ⅓ EN 10 051 for cut to length sheet.

**Length and Width**
According to SSAB’s dimension program. Tolerances conform to EN 10 051. Tighter tolerances available on request.

**Shape**
Tolerances according to EN 10 051.

**Flatness**
For cut to length sheet the tolerances are according to Hardox Flatness Guarantees Class B, that offers narrower tolerances compared to EN 10 051.

**Surface Properties**
According to EN 10 163-2, Class A Subclass 1.

**Bending**
Tolerences for Hardox cut to length sheet are according to Hardox Bending Guarantees Class A. Extra Close can be supplied after special agreement.
HARDOX 400 SHEET

Delivery Conditions
The delivery condition is Q or QT (Quenched or Quenched and Tempered). Cut to length sheet are delivered with an as-rolled surface and mill edges as standard delivery condition. Delivery requirements can be found in SSAB’s brochure 41-General Product Information Strenx, Hardox, Armox and Toolox-UK or at www.ssab.com.

Fabrication and Other Recommendations
Welding, bending and machining
Recommendations can be found in SSAB’s brochures at www.hardox.com or consult Tech Support, help@ssab.com.

Hardox 400 is not intended for further heat treatment. It has obtained its mechanical properties by quenching and when necessary by means of subsequent tempering. The properties of the delivery condition cannot be retained after exposure to temperatures in excess of 250ºC. Hardox sheets can be welded and thermal cut in room temperature without pre-heating, all common welding processes can be used.

Appropriate health and safety precautions must be taken when welding, cutting, grinding or otherwise working on this product. Grinding, especially of primer coated plates, may produce dust with a high particle concentration.