



## HARDOX 450 CR SHEET



### HARDOX 450 CR SHEET

#### General Product Description

The most popular abrasion-resistant steel with excellent structural properties.

Hardox 450 is an abrasion-resistant steel with a nominal hardness of 450 HBW. Hardox 450 combines good bendability and weldability with an option for guaranteed impact toughness (Hardox 450 Tuf).

The products can be used in many different components and structures that are subject to wear. Hardox 450, with an extra 50 Brinell hardness over our 400 grade, provides better dent and abrasion resistance as well as longer wear life, so you can achieve even greater savings.

#### Dimension Range

Hardox 450 Cold Rolled is available in thicknesses of 0,70- 2,10 mm. The supplied width is 800- 1500 mm and length 1000- 8000 mm. More detailed information on dimensions is provided in the dimension program.

#### Mechanical Properties

Thickness (mm)	Hardness <sup>1)</sup> (VH <sub>5</sub> )	Tensile strength R <sub>m</sub> (MPa)	Typical yield strength (MPa), not guaranteed	Typical Elongation A <sub>80</sub> (%)
0.70- 2.10	425- 475	1400- 1600	1250	3

<sup>1)</sup> Hardox 450 Cold Rolled (CR) cut to length sheet are measured in Vickers (VH<sub>5</sub>). Vickers hardness test is used according to EN ISO 6507-1.

#### Chemical Composition (heat analysis)

C <sup>1)</sup> (max %)	Si <sup>1)</sup> (max %)	Mn <sup>1)</sup> (max %)	P (max %)	S (max %)	Cr <sup>1)</sup> (max %)	Ni <sup>1)</sup> (max %)	Mo <sup>1)</sup> (max %)	B <sup>1)</sup> (max %)
0.18	0.25	1.30	0.015	0.004	0.10	0.10	0.04	0.003

The steel is grain refined.

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## Carbon Equivalent CET(CEV)

Thickness (mm)	0.70 - 2.10
Max CET(CEV)	0.33 (0.44)
Typ CET(CEV)	0.31 (0.39)

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

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

## Tolerances

### Thickness

Tolerances according to Hardox Thickness Guarantees. Hardox® Guarantees meet the requirements of EN 10 131 for Cold rolled sheet products.

### Length and Width

According to SSAB's dimension program. Tolerances according to SSAB's mill edge standards or tolerances that conform to EN 10 131.

### Shape

Tolerances according to EN 10 131.

### Flatness

For Cold Rolled sheet the tolerances are according to Hardox Flatness Guarantees Class B, that offers narrower flatness tolerances compared to EN 10 131.

### Surface Properties

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

### Bending

Tolerances for Hardox Cold rolled sheet are according to Hardox Bending Guarantees Class C.

## Delivery Conditions

The delivery condition is Q or QT (Quenched or Quenched and Tempered). Hardox 450 (0.70- 2.10 mm) is supplied as cold rolled surface. Delivery requirements can be found in SSAB's brochure 41-General Product Information Strenx, Hardox, Armox and Toolox-UK or at [www.ssab.com](http://www.ssab.com).

## Fabrication and Other Recommendations

### Welding, bending and machining.

Recommendations can be found in SSAB's brochures at [www.hardox.com](http://www.hardox.com) or consult Tech Support, [techsupport@ssab.com](mailto:techsupport@ssab.com).

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Hardox 450 (0,70- 2,10 mm) has obtained its mechanical properties by quenching and tempering. and Fabrication The properties of the delivery condition can not be retained after exposure to service or preheating temperatures in excess of 200 °C (390 F). Hardox 450 (0,70- 2,10 mm) is not intended for further heat treatment.

Appropriate health and safety precautions must be taken when welding, cutting, grinding or otherwise working on the product. Grinding, especially of primer coated plates, may produce dust with high particle concentration. Our Technical Customer Service Department will provide further information on request.



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