HARDOX®
WEAR PLATE

Hardox® 500

General Product Description

The bendable, weldable and highly abrasion-resistant steel.

Hardox® 500 is a bendable and weldable abrasion-resistant steel with a nominal hardness of 500 HBW. Suitable for applications that demand higher wear resistance. Hardox® 500 increases payload and service life while maintaining good processability and toughness.

Dimension Range

Hardox® 500 is available as plate in thicknesses of 4.0 – 103.0 mm and as sheet in thicknesses of 2.0 - 7.0 mm. Hardox® 500 plate is available in widths up to 3350 mm and lengths up to 14630 mm. Hardox® 500 sheet is available in widths up to 1650 mm and lengths up to 16000 mm. More detailed information on dimensions is provided in the dimension program.

Mechanical Properties

Grade	Thickness (mm)	Hardness [1] (HBW)	Typical yield strength (MPa), not guaranteed
Hardox® 500 sheet	2.0 - 7.0	470 - 530	1400
Hardox® 500 plate	4.0 - 32.0	470 - 530	1400
Hardox® 500 plate	32.1 - 103.0	450 - 540	1400

[1] 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.
The nominal thickness of supplied plates will not deviate more than +/- 15 mm from the thickness of the test specimen used for hardness testing. For sheet the Brinell hardness test is according to EN ISO 6506-1 on each heat treatment individual/coil. Hardness is measured on a milled surface 0.3 - 2 mm below surface.

Hardox® wear plate is through-hardened. Minimum core hardness is 90 % of the guaranteed minimum surface hardness.

Impact Properties

Grade	Longitudinal test, typical impact energy, Charpy V 10x10 mm test specimen.
Hardox® 500 sheet & plate [1]	37 J/ -40 °C

[1] Impact toughness measured upon agreement. For thicknesses between 3 mm and 11.9 mm, subsize Charpy V-specimens are used. The specified impact toughness 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. Average of three tests.

Chemical Composition (heat analysis)

Grade	C *) (max %)	Si *) (max %)	Mn *) (max %)	P (max %)	S (max %)	Cr *) (max %)	Ni *) (max %)	Mo *) (max %)	B *) (max %)
Sheet	0.27	0.50	1.60	0.025	0.010	1.20	0.25	0.25	0.005
Plate	0.30	0.40	1.30	0.020	0.010	2.20	2.0	0.40	0.005

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

Carbon Equivalent CET(CEV)

Thickness (mm)	Sheet 2.0 - 7.0	Plate 4.0 - 13.0	Plate 13.1 - 19.9	Plate 20.0 - 39.9	Plate 40.0 - 103.0
Max CET(CEV)	0.38 (0.49)	0.38 (0.53)	0.43 (0.64)	0.45 (0.66)	0.50 (0.91)
Typ CET(CEV)	0.33 (0.45)	0.37 (0.51)	0.41 (0.63)	0.41 (0.63)	0.48 (0.86)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given in SSAB's brochure Hardox® Guarantees or at www.ssab.com.

Thickness

Tolerances according to Hardox® Thickness Guarantee. Hardox® Guarantee meet the requirements of EN 10 029 Class A for plate and ½ EN 10 051 for sheet.

SSAB

Length and Width

According to SSAB's dimension program. For plate, the tolerances are according to SSAB´s mill edge standard or tolerances that conform to EN 10 029. Tolerances conform to EN 10 051 for sheet, tighter tolerances available on request.

Shape

Tolerances according to EN 10 029 for plate and EN 10 051 for sheet.

Flatness

Tolerances according to Hardox® Flatness Guarantee Class D for plate, which are more restrictive than EN 10 029. For sheet, the tolerances are according to Hardox® Flatness Guarantee Class A, that offer narrower tolerances compared to EN 10 051.

Surface Properties

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

Bending

Bendability for plate is according to Hardox® Bending Guarantee Class G. For sheet, the bendability is according to Hardox® Bending Guarantee Class C.

Delivery Conditions

The delivery condition is Q or QT (Quenched or Quenched and Tempered). Hardox® 500 plates are delivered with sheared or thermally cut edges and thicknesses over 80 mm are delivered with mill edge as standard. Hardox® 500 sheets are delivered with an as-rolled surface and mill edge as standard.

Delivery requirements can be found in SSAB's brochure Hardox® Guarantees 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, techsupport@ssab.com.

Hardox® 500 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 250°C (482 degrees F).

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.

Contact Information

www.ssab.com/contact