

WEAR RESISTANT PLATE

Hardox 400 is a wear resistant steel with a hardness of 400 HBW.

Applications	Hardox 400 is the wear resistant steel for combined payload and service life solutions.											
Chemical Composition (ladle analysis)	Thickness mm	C	Si	Mn	P	S	Cr	Ni	Mo	B	CEV	CET
		max %	max %	max %	max %	max %	max %	max %	max %	max %	typv.	typv.
Width ≤ 1600 mm	3 - 6	0,15	0,70	1,60	0,025	0,010	0,50	0,25	0,25	0,004	0,41	0,28
	3 - (8)	0,15	0,70	1,60	0,025	0,010	0,30	0,25	0,25	0,004	0,33	0,23
	8 - 20	0,15	0,70	1,60	0,025	0,010	0,50	0,25	0,25	0,004	0,42	0,29
	(20) - 32	0,18	0,70	1,60	0,025	0,010	1,00	0,25	0,25	0,004	0,48	0,29
	(32) - 45	0,22	0,70	1,60	0,025	0,010	1,40	0,50	0,60	0,004	0,57	0,31
	(45) - 51	0,22	0,70	1,60	0,025	0,010	1,40	0,50	0,60	0,004	0,57	0,38
	(51) - 80	0,27	0,70	1,60	0,025	0,010	1,40	1,00	0,60	0,004	0,65	0,41
	(80) - 130	0,32	0,70	1,60	0,025	0,010	1,40	1,50	0,60	0,004	0,73	0,48

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

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

The steel is grain refined.

Hardness	HBW 370-430		
Mechanical Properties Typical values for 20 mm plate thickness	Yield strength R_e MPa 1000	Tensile strength R_m MPa 1250	Elongation A_5 10 (transverse)
Impact Properties Charpy V-notch test according to EN 10 045-1 Typical value for 20 mm plate thickness	Test temperature °C -40 (-40° F)	Impact energy Charpy-V J 45 (longitudinal)	
Testing	Brinell hardness, HBW according to EN ISO 6506-1, on a milled surface 0,3-3 mm below surface. At least per heat and 40 tons. The nominal thickness will not deviate more than ±15 mm from that of the tested plate.		

Delivery Conditions Q. (Quenched)

Surface Conditions	Hardox 400 can be delivered in shot blasted and primer coated surface condition.
Dimensions	Hardox 400 is supplied in thicknesses of 3-130 mm. For dimensions with width \leq 1600 mm and thickness 3-6 mm preferred widths are 1500 or 1600 mm, delivered as cut-to-length in as rolled surface condition with mill edge as standard. Cut edges is on option. Widths up to 3300 mm are available. More detailed information on dimensions is provided in the dimension program. (www.hardox.com)
Tolerances	Thickness tolerances according to SSAB thickness precision guarantee AccuRollTech™. - AccuRollTech™ meets the requirements of EN 10 029. Class A, but offers more narrow tolerances. For shape, length, width and flatness the tolerances conform to EN 10 029 (Flatness, Class N). Widths \leq 1600 mm and thickness 3-6 mm the shape, length and width conform to EN 10 051, tighter tolerances on request. More detailed information can be found at www.hardox.com .
Surface Properties	According to EN 10 163-2 - Requirements according to Class A. - Repair conditions according to Subclass 1.
General Technical Delivery Requirement	You find further information on the website www.hardox.com
Heat Treatment and Fabrication	Hardox 400 has obtained its mechanical properties by quenching and when necessary by means of subsequent tempering. The properties of the delivery condition can not be retained after exposure to service or preheating temperatures in excess of 250°C (480°F). Hardox 400 is not intended for further heat treatment. Hardox 400 is not suited for pickling. For information concerning welding and fabrication, see our brochures on www.hardox.com or consult our TechSupport. 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.