Hardox® Tubes and Pipes

General Product Description

Abrasion-resistant tubes for extreme performance and extended service life

Hardox® Tubes and Pipes, as hard and tough as our wear plates, offer outstanding performance when you need both high wear resistance and a lighter product.

Despite its hardness, Hardox® Tubes and Pipes can be weld, cut, milled and drilled using standard workshop practices. It can replace costly wear products like hard-faced overlay plates and high chrome white iron.

Dimension Range

Hardox® Tubes and pipes are available in circular shape.

Dimensions	Hardox® 400	Hardox® 500
Outer diameter (mm)	76.1 - 219.1	76.1 - 133.0
Wall thickness (mm)	3.0 - 6.0	3.0 - 6.0
Mill length (mm)	6000	6000

Other lengths are available upon request.

Circular

Outer diameter	3.0 mm (kg/m)	4.0 mm (kg/m)	5.0 mm (kg/m)	6.0 mm (kg/m)
76.1 mm	5.41	7.11	8.77	10.4
88.9 mm	6.36	8.38	10.4	12.3
101.6 mm	7.29	9.63	11.9	14.2
108 mm	7.77	10.3	12.7	15.1
114.3 mm	8.23	10.9	13.5	16.0
121 mm	8.73	11.5	14.3	17.0
133 mm	9.62	12.7	15.8	18.8
139.7 mm		13.4	16.6	19.8
168.3 mm			20.1	24.0
193.7 mm			23.3	27.8
219.1 mm				31.5

Mechanical Properties

Product type	Wall Thickness (mm)	Hardness [1] (HBW)
Hardox® 400	3.0 - 6.0	360 - 440
Hardox® 500	3.0 - 6.0	470 - 530

[1] Brinell hardness test, HBW, according to EN ISO 6506-1.

Chemical Composition

C (max %)	Si (max %)	Mn (max %)	P (max %)	S (max %)	Cr (max %)	Ni (max %)	Mo (max %)	B (max %)
0.30	0.70	1.60	0.020	0.010	1.50	1.5	0.60	0.005

The steel is grain refined.

Carbon Equivalent CET(CEV)

Wall Thickness	Hardox® 400 3.0 - 6.0	Hardox® 500 3.0 - 6.0
Typical CET(CEV)	0.33 (0.52)	0.41 (0.62)

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

Tolerances

Characteristic	Circular wear Tolerances based on the requirements of EN 10210
Outside diameter (D) [1)]	±1%, with a minimum of ±0.5 mm and a maximum of ±10 mm
Out-of-roundness	2%, when D/T ≤ 100
Thickness (T)	±10% when T ≤ 5 mm and ±0.5 mm when T > 5 mm
Straightness	0.20% of total length and 3 mm over any 1 m length
Mass per unit length	Individual tube: ±6%
Standard length	≥ 6000 mm: 0/+50 mm
Exact length	Agreed at the time of enquiry and order

[1)] All external dimensions are measured with a minimum distance from the end of the section. The distance must be a minimum of 100 mm.

Delivery Conditions

Hardox® Tubes and pipes are delivered in quenched condition except for diameters above 133 mm, which are delivered in as-rolled condition.

Fabrication and Other Recommendations

Recommendations can be found in SSAB's brochures at www.hardox.com or consult Tech Support, techsupport@ssab.com.

Hardox® Tube 500 has obtained its mechanical properties by quenching and after roll forming and plasma welding. The properties of the delivery condition cannot be retained after exposure to service or preheating temperatures in excess of 250ºC. Hardox® Tube 500 is not intended for further heat treatment.

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