



HARTPLAST® 450

HARTPLAST 450 are quenched, fine grain, wear resistant plates with an a nominal hardness of 450HBW in delivery condition.

APPLICATIONS

Heavy plates HARTPLAST 450 are mainly recommended for the following applications: mining and earthmoving machinery, crushers, breakers, cutting edges, industrial trucks, conveyors.

TECHNICAL CHARACTERISTICS

Plate grade	Thickness [mm]	Chemical composition, [%]							
		C	Mn	Si	Cr	Mo	B	CEV max	CET* typical
HARTPLAST® 450	10 ÷ 19	max	max	max	max	max	max	0,55	0,37
	20 ÷ 40	0,24	1,60	0,50	1,00	0,40	0,005	0,63	0,40
$CEV = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Cu+Ni}{15}$		$CET = C + \frac{Mn+Mo}{10} + \frac{Cr+Cu}{20} + \frac{Ni}{40}$							
HARDNESS		410 ÷ 490 HB							
MECHANICAL PROPERTIES		R_e^* [MPa]	R_m^* [MPa]		A_5^* [%]		$KV_{\parallel-20 C}^*$ [J]		
Typical values for 20 mm plate thickness		1200	1400		9,5		35		

* - typical values not guaranteed

DIMENSIONS

Thickness [mm]	Width [mm]	Length [mm]
10 ÷ 12	1750 ÷ 2000	4000
>12 ÷ 20	1750 ÷ 2500	÷
>20 ÷ 40	1750 ÷ 2750	8000

TESTING

Brinell surface hardness according EN ISO 6506-1 is performed 2,0 mm below plate surface once per lot. A test lot contains plates of the same thickness, manufactured from one heat, with maximum weight of 20 t.

SURFACE QUALITY

According to EN 10163-2, Class A, Subclass 3.

If agreed by purchaser and manufacturer surface condition class B is allowed

TOLERANCES

Length and width tolerances according to EN 10029

Thickness tolerances according to EN 10029, Class A

Tolerances of flatness :

t ≤ 16mm	15 mm/1m
16 < t < 25	10
25 ≤ t < 40	9
t = 40	8

t- plate thickness

INTERNAL QUALITY

Internal quality of plates shall meet requirements of class S1 according to EN 10160. If agreed by purchaser and manufacturer plates satisfying requirements of class S2 in accordance with EN 10160 are delivered.

PROCESSING

COLD FORMING

HARTPLAST 450 is suitable for cold bending at room temperature at 90° with following parameters :

Thickness [mm]	Direction	Minimum bending radius	Minimum die opening
8÷20	Transverse	5 t	14 t
	Longitudinal	6 t	16 t

t-plate thickness

THERMAL CUTTING

HARTPLAST 450 plate can be cut using both cold and thermal cutting methods. The cold methods include sawing, shearing, abrasive water jet cutting, and thermal methods include flame, plasma and laser cutting.

Flame cutting should be performed at room or higher temperature. Plates of thickness 20 mm and greater ought to be preheated to 75÷125 °C to avoid cut edge cracking. Preheating can be carried out by means of burner lances, electric heating mats or by heating in a furnace. Preheating plates above 250°C must be avoided due to possible decrease of hardness.

MACHINING

Machining can be carried on using all conventional methods of machining, such as turning, tapping, milling, drilling, etc. HARTPLAST 450 plates can be machined with high speed steel (HSS and HSS-Co alloyed drills) or cemented carbide (CC) tools.

WELDING

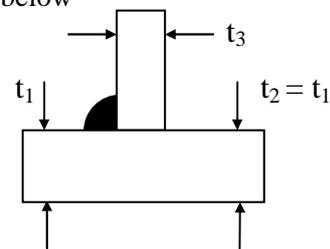
Plates HARTPLAST 450 are suitable for welding using manual and automatic welding technology such as submerged arc welding, gas shielded arc welding or manual welding. To avoid cold cracking in the welded joints low hydrogen content (≤ 5 ml/100g) welding consumables are recommended. Shielded electrodes must be carefully dried before welding. Plates of thickness 10÷50 mm should be welded using arc energy ($k \cdot U \cdot I \cdot 60/v \cdot 1000$) 1,0 to 2,5 kJ/mm accordingly.

Before welding, plates should be preheated to temperature as shown below

$t_1 + t_2 + t_3$ mm	40	50	60	70	80	90	100	110
temp. °C	100			125			175	

For heat input = 1,7kJ/mm and hydrogen content ≤ 5 ml/100g

The interpass temperature applied should not exceed 225°C.



More information available at New Products and New Technologies Dept. of ISD HZC
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