

## HARDOX® HiTuf in the workshop

HARDOX HiTuf is a wear plate with an extremely high crack resistance. HARDOX HiTuf has a hardness of about 350 HBW and is intended for applications where high demands are imposed on the combination of toughness and abrasion resistance.

Application areas where HARDOX HiTuf is utilised are cutting edges, demolition tools and rippers.

### HARDOX HiTuf

Hardness (surface): 310–370 HBW  
Brinell hardness according to EN ISO 6506-1, on a milled surface 0,5–2,0 mm below plate surface.

#### Mechanical properties (Typical)

	Rp0,2 (MPa)	Rm (MPa)	A5 (%)	Toughness (CVL) -40°C
t = 40–70 mm	950	980	16	95 J
t = 71–120 mm	850	900	16	70 J

### Welding in HARDOX HiTuf



HARDOX HiTuf can by advantage be welded to any other wear plate or structural plate using all the conventional welding methods available. The choice of consumables is determined by the requirements on the weld mechanical properties. To reduced the risk of weld hydrogen cracking the following recommendations are given:

- Use electrodes giving a weld metal yield stress of max 500 MPa
- If utilizing stick electrodes or flux cored wires, use a basic flux system.
- Keep the weld metal hydrogen content low, less then 5 ml/100g weld metal.

#### Carbon equivalent (Typical)

Carbon equivalent (Typical)	CEV	CET
t = 40–70 mm	0.56	0.38
t = 71–120 mm	0.64	0.39

$$\text{CEV} = \text{C} + \text{Mn}/6 + [\text{Cr} + \text{Mo} + \text{V}]/5 + [\text{Cu} + \text{Ni}]/15$$

$$\text{CET} = \text{C} + [\text{Mn} + \text{Mo}]/10 + [\text{Cr} + \text{Cu}]/20 + \text{Ni}/40$$

#### Recommended preheat temperature

Combined plate thickness (mm)	Preheat requirement (°C)
80–90	75
90–100	100
>100	150

If preheating can not be fully performed austenitic stainless consumables are recommended to be used.

## Cutting in HARDOX HiTuf



Oxygen cutting can be performed without preheating to a plate thickness of 100 mm.

### Preheating

Thickness (mm)	Preheat requirement (°C)
> 90 mm	100–125

If cutting can not be performed using preheating, cutting with restricted cutting speeds can be applied. Please contact our technical customer support for more information.

## Drilling In HARDOX HiTuf



Individual holes can be drilled with ordinary HSS drills. For rational production, either a microalloyed (HSS-E) or a cobalt alloy drill is recommended.

### Recommended data for drilling, using HSS/HSS-E and HSS-Co tools

HSS-Drill diameter [mm]	Feed rate, f [mm/rev] / Speed, n [rpm]
10	0.10 / 500
15	0.16 / 350
20	0.23 / 250
25	0.30 / 200
30	0.35 / 180

For improved productivity cemented carbide drills can be used. The use of cemented carbide drills requires stable machines.

### Recommended data for drilling using cemented carbide tools

Tool	Cutting speed Vc [m/min]	Feed rate, f [mm/rev]
Solid cemented carbide	40–50	0.10–0.18
Brazed cemented carbide	40–60	0.12–0.18
Indexable inserts	70–90	0.10–0.18

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## Milling In HARDOX HiTuf



To ensure rational production, milling cutters with cemented carbides inserts are recommended.

### Process data for face milling of HARDOX HiTuf.

	ISO Class	Feed rate (Fz)
		0.1–0.2–0.3
Coated cemented carbides	P40 / C5	95–75–50 m/min
	P25 / C6	200–160–130 m/min
	ISO Class	0.1–0.2
Cermet	P20 / C6–C7	220–170 m/min

### Process data for end milling of HARDOX HiTuf.

	ISO Class	Feed rate (Fz)
		0.02 – 0.10
Uncoated cemented carbid	K10 / C3	90 m/min
Coated cemented carbide	K10 / C3	130 m/min
	ISO Class	0.05–0.15
Indexabel carbide insert	P10 / C7	140–120 m/min
	ISO Class	0.03–0.09
HSS-Co	TiCN coated	18 m/min

## Counterboring and countersinking in HARDOX HiTuf



Counterboring and countersinking are best performed using tools with replaceable cemented carbide inserts and a rotating revolver. Use coolant.

Counterboring and countersinking		
	Counter boring	Countersinking
Vc [m/min]	40–70	30–50
Feed rate, f [mm/rev]	0.10–0.20	0.7–0.15
D [mm]	Speed, n [rpm]	
19	670–1090	470–765
24	530–870	370–610
34	375–610	260–430
42	300–500	210–350
57	225–365	160–255

Tapping of HARDOX HiTuf, using coated taps.	
	HSS-Co ( HSS-E) TiN or TiCN Coated
Vc [mm/min]	8
Size	Speed, n [rpm]
M10	255
M20	125
M24	105
M30	85
M42	60

When HARDOX HiTuf plates are being tapped, thread oil or thread paste is recommended to be used as lubricant. If uncoated taps are used, the cutting data should be reduced by 30%.

# HARDOX®

**WEAR PLATE**

HARDOX wear plate only from SSAB Oxelösund  
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