SSAB

A stronger,
lighter and more
sustainable world

Recommended consumables for Hardox 500

- Max. yield strength of consumable (all weld metal) 500 MPa.
- Diffusible hydrogen content of consumable should not exceed 5 ml/100 g weld metal (H5)
- Make sure that consumable are stored and handled according to the consumable manufacturer recommendations
- Tack welding with stainless steel consumables (AWS 307) could be performed in room temperature if necessary.

Table 5: Recommended consumables for all steels in the Hardox® wear plate product range

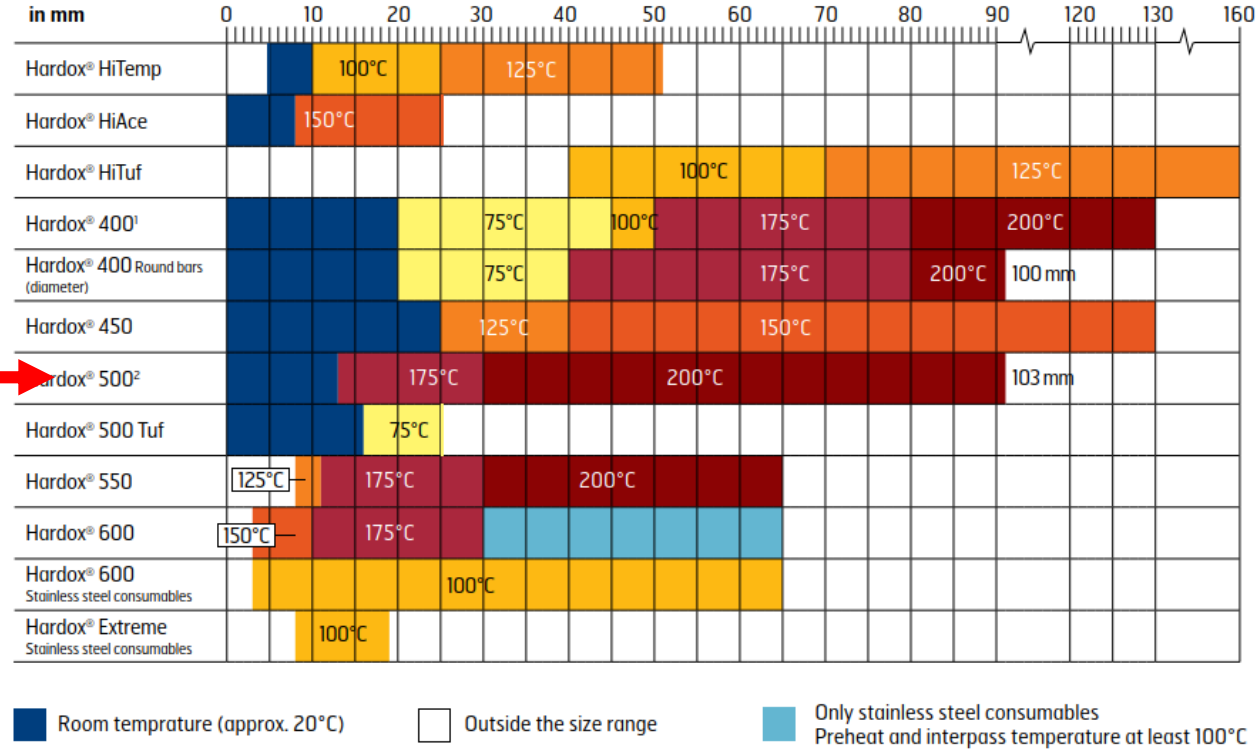
WELDING METHOD	AWS CLASSIFICATION	EN CLASSIFICATION
MAG/ GMAW, solid wire	AWS A5.28 ER70X-X	EN ISO 14341-A- G 42x
	AWS A5.28 ER80X-X	EN ISO 14341-A- G 46x
MAG/ MCAW, metal cored wire	AWS A5.28 E7XC-X	EN ISO 17632-A- T 42xH5
	AWS A5.28 E8XC-X	EN ISO 17632-A- T 46xH5
MAG/ FCAW, flux cored wire	AWS A5.29 E7XT-X	EN ISO 17632 -A- T 42xH5
	AWS A5.29 E8XT-X	EN ISO 17632 -A- T 46xH5
MMA (SMAW, stick)	AWS A5.5 E70X	EN ISO 2560-A- E 42xH5
	AWS A5.5 E80X	EN ISO 2560-A- E 46xH5
SAW	AWS A5.23 F49X	EN ISO 14171-A- S 42x
	AWS A5.23 F55X	EN ISO 14171-A- S 46x
TIG/ GTAW	AWS A5.18 ER70X	EN ISO 636-A- W 42x
	AWS A5.28 ER80X	EN ISO 636-A- W 46x

Recommended preheating temperatures for Hardox 500

- Recommended preheating temperature for Hardox 500, t=50 and 80 mm is 200 °C
- Max interpass temperature is 225 °C
- Preheating is usually conducted with either electrical mats or an open oxy fuel flame. Do not overheat the base material (risk for annealing of the material).

The single plate thickness (diameter) is shown on the x-axis. Minimum recommended preheat and interpass temperatures are given for different single plate thicknesses. Note that every increase in temperature starts at 0.1 mm (0.004") above the indicated thickness in the charts.

Table 4a



Preheating process

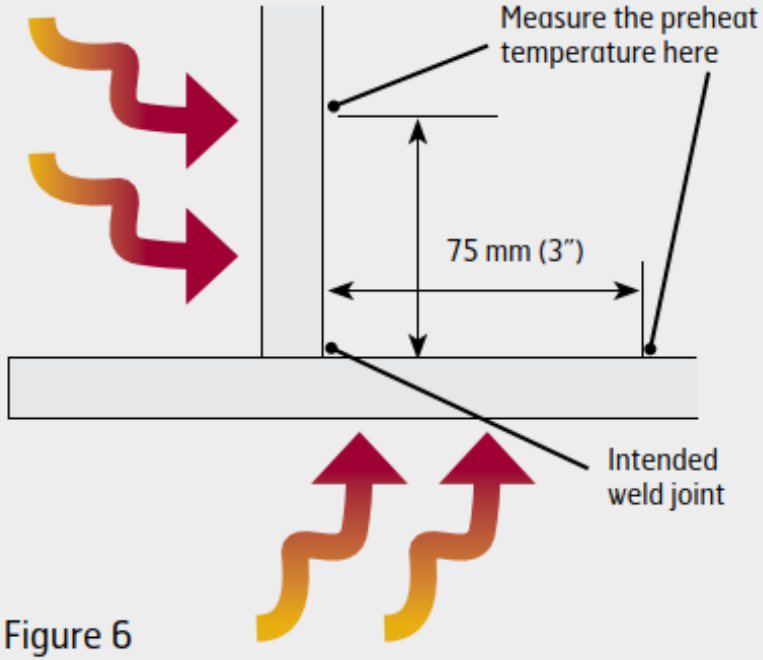
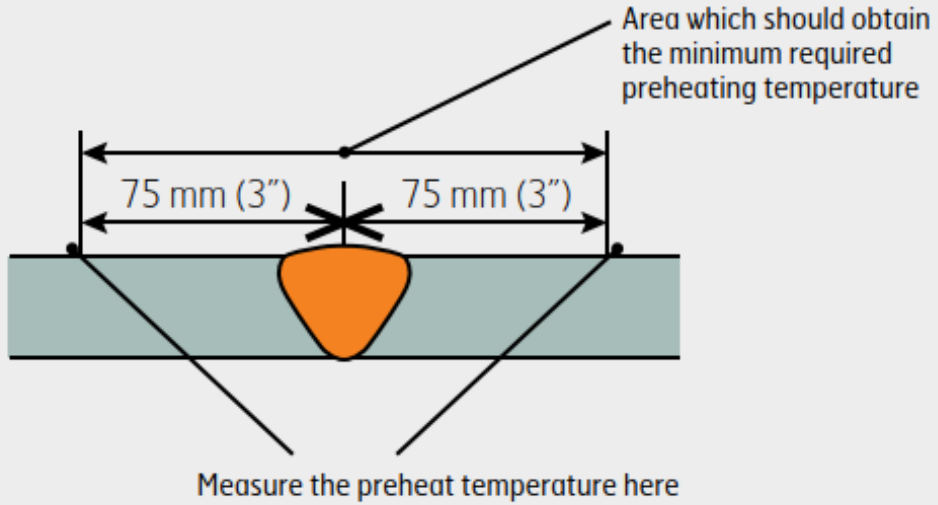


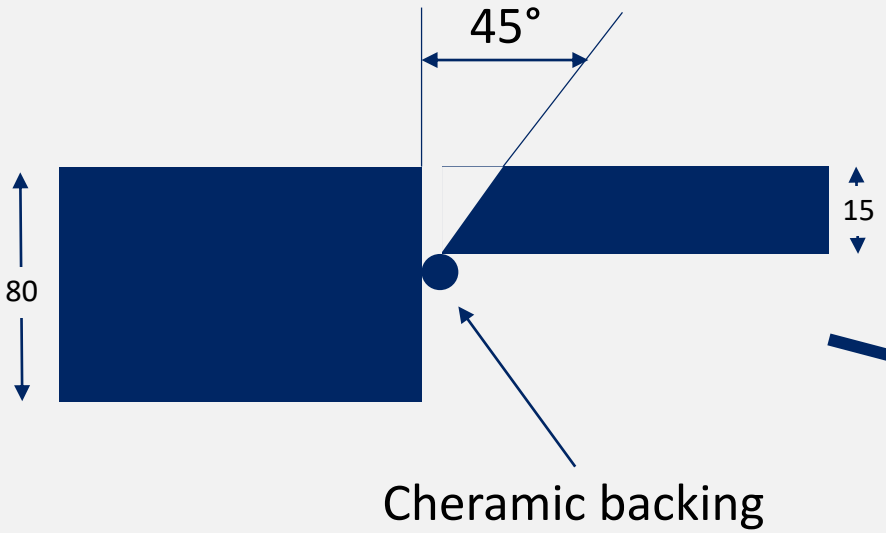
Figure 6

A minimum waiting time of 2 min/25 mm (2 min/ 1 inch) thickness should be observed before measuring the preheating temperature. The minimum preheating temperature should be obtained in an area of 75 + 75 mm (3″+ 3″) around the intended weld joint; see above.

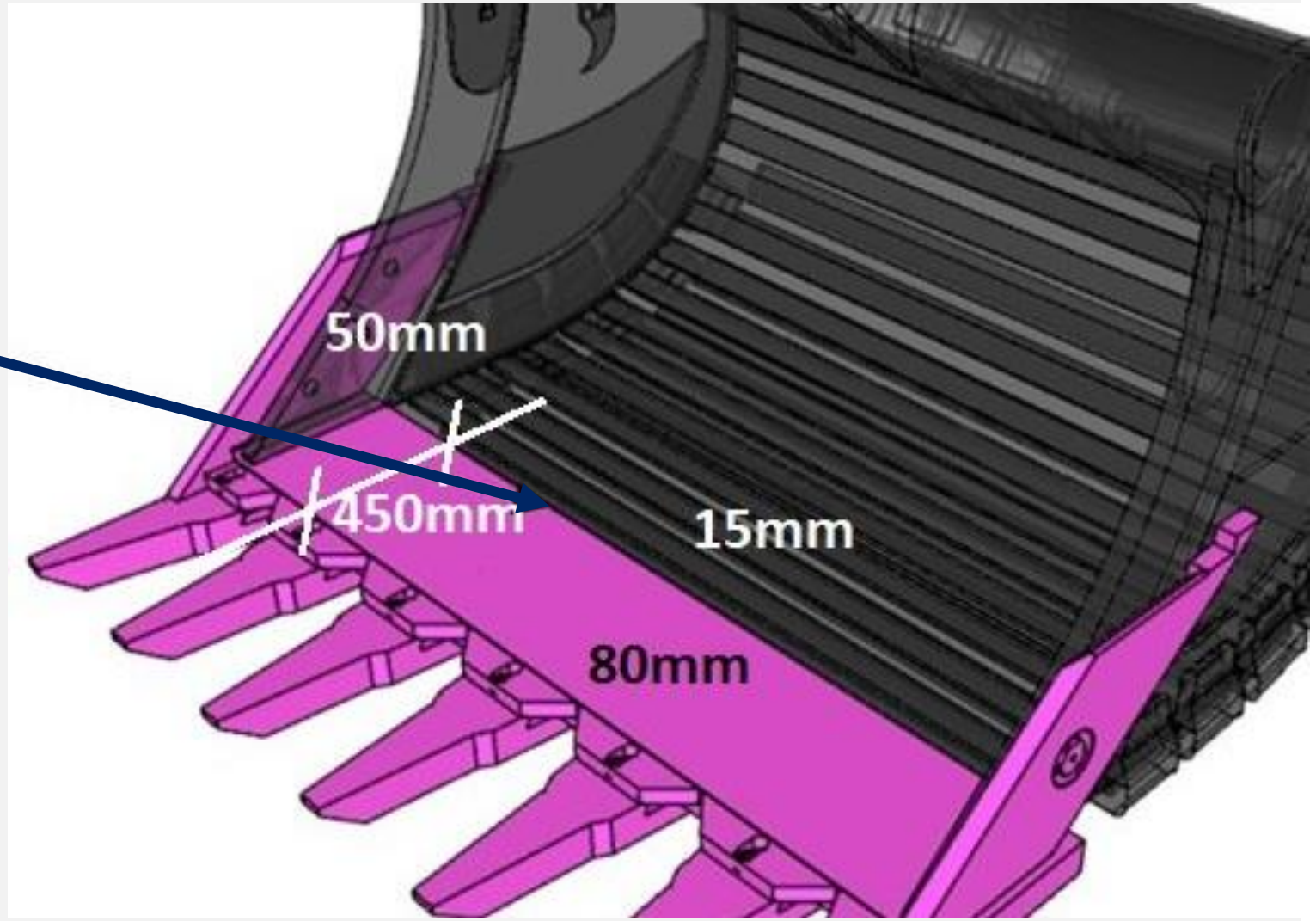


The interpass temperature can also be measured in the weld metal or in the immediately adjacent parent metal.

Welding of ”cut edge”plate, Hx 500, t=80 mm

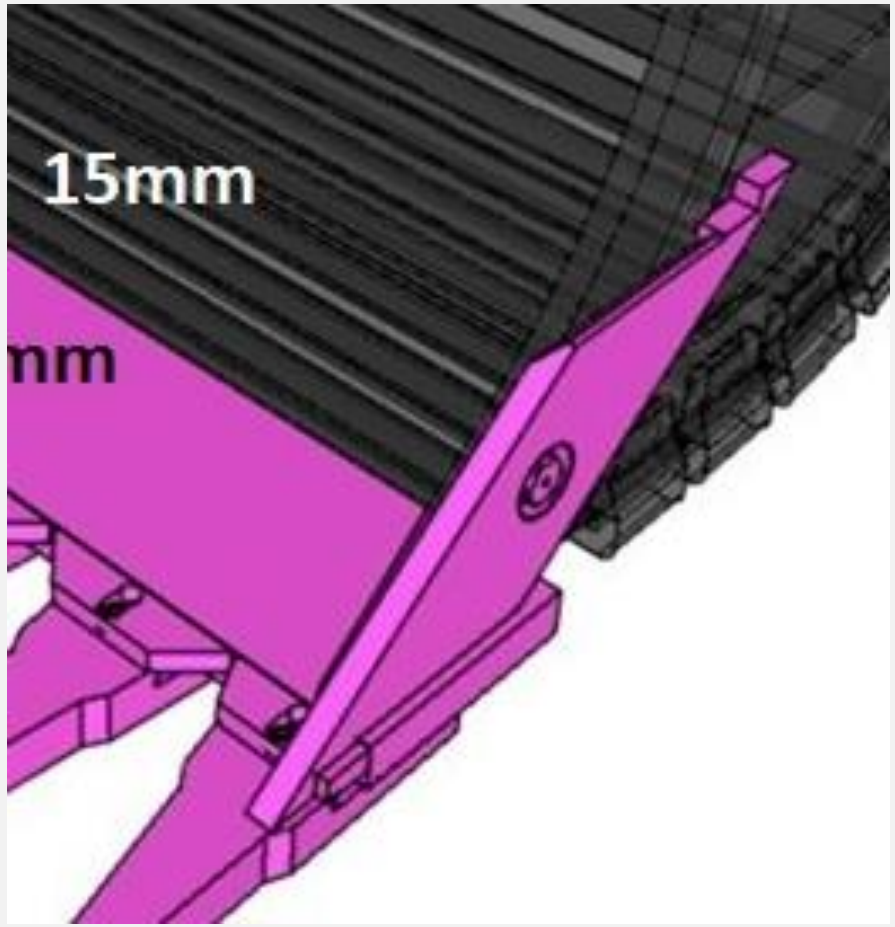


- Start the weld sequence from the central part of the cut edge and weld towards the sides. This should be done alternately towards the both sides and with the start point at different locations of the weld length.



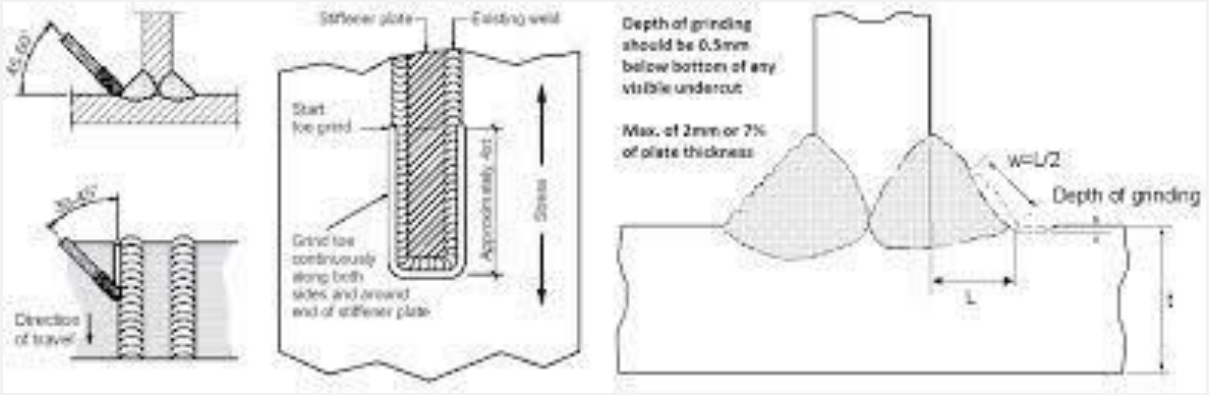
Welding sequence

- Tack welding should be performed at a preheating temperature of 200 °C. If tack welding cant be performed at elevated temperature, use stainless steel consumables according to AWS 307.
- Min. tack welding length, 50 mm. Distance in-between tack welds should be adapted to the structure but is usually not more than 200 - 250 mm.
- The 50 mm plates on the right and left hand side should be alternately welded in order to avoid overheating (too high interpasstemperature)
- Start with the vertical sides of the side brackets before the horizontal weld joints.
- Downhill welding is not permitted.



General information

- Avoid any start and stops at corners, see fig 01
- Use a rotating grinder to grind the weld toe (transition in-between the weld metal and base material) at highly fatigue exposed areas.



Fish tail technique

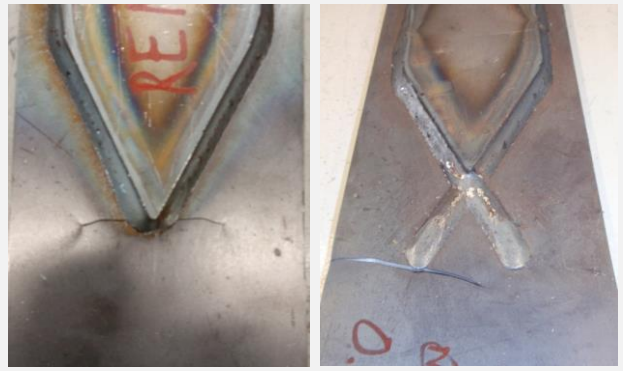
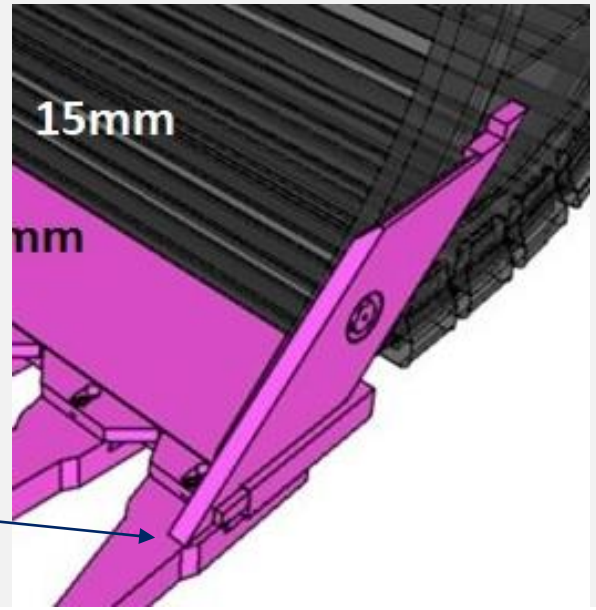


Fig 01: Fish tail technique provides 5 times higher fatigue strength



Weld around the corner of the of the front part of the side plate should be grinded smooth. Especially the weld toe area.

Contact info.

- If you have any further questions regarding anything related to the weld performance don’t hesitate to contact me:

Mikael Reinberth

Mikael.Reinberth@ssab.com

+46 70 6079018