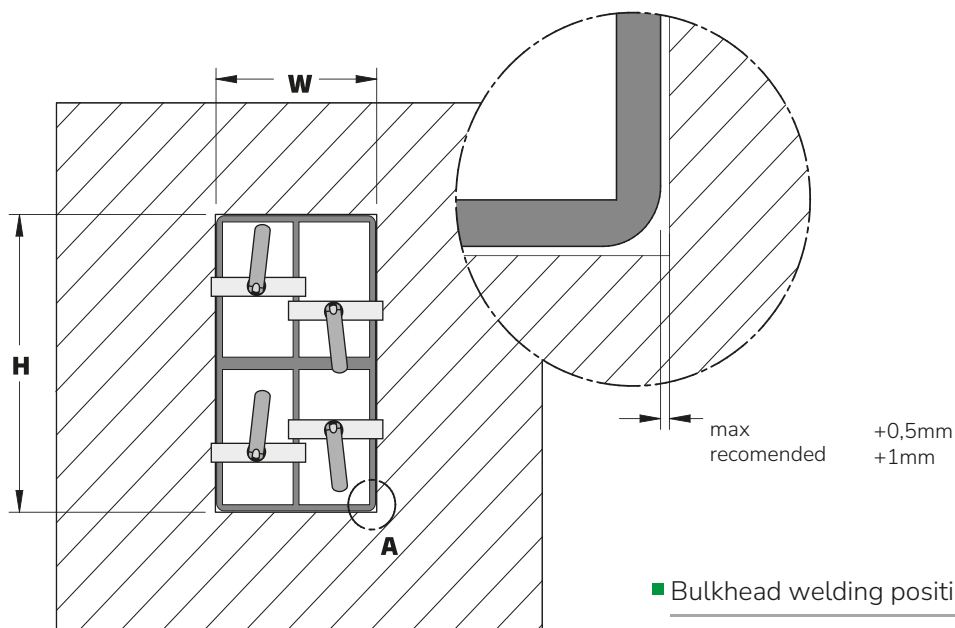




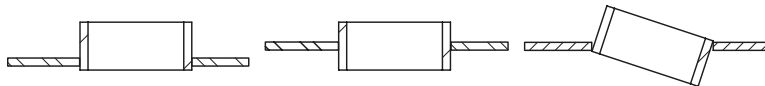
WELDING INSTRUCTIONS

STANDARD WELDING INSTRUCTIONS

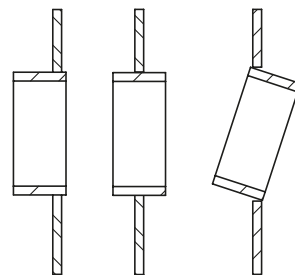
1. Check the measures of the precut hole and external dimensions of the frame. Recommended gap around the frame is in between 1mm and 2mm (0.5-1mm on every side of the frame).



Deck welding positions



Bulkhead welding positions

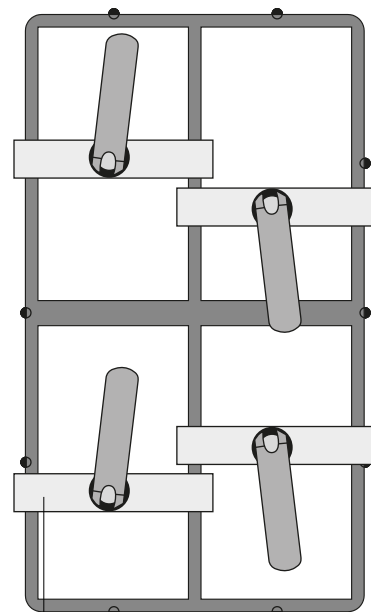
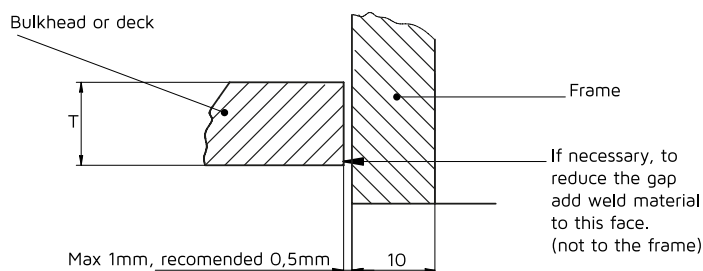


2. Tack weld on the front side, centring the frame onto the cut-out hole:

- Horizontally, one tack on every aperture.

- Vertically, one tack on every aperture and on every vertical division.

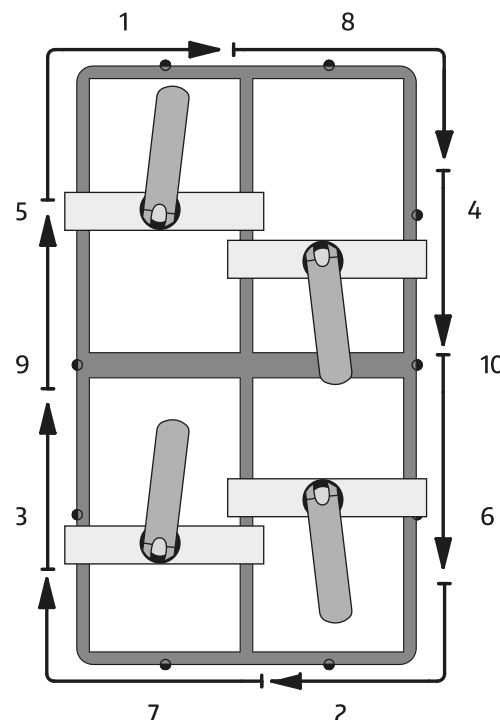
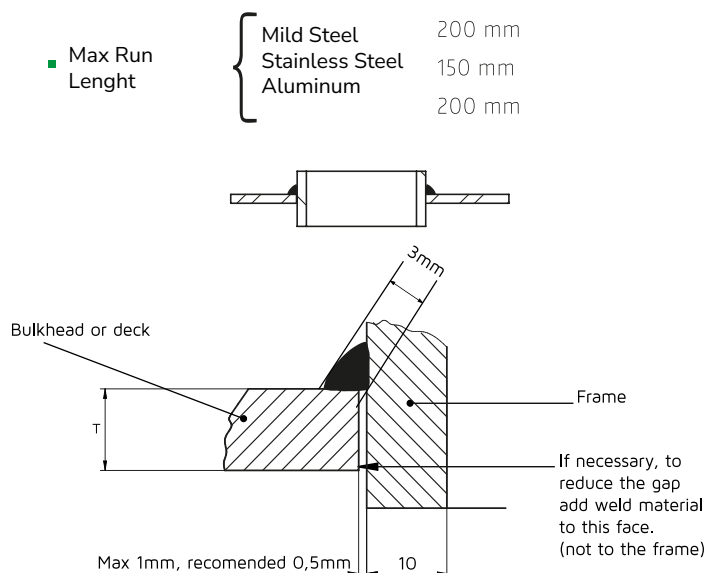
Check the gap measures all around the frame are maintained. If necessary, add weld material to the bulkhead/deck to reduce the gap (not to the frame)
Use HTS welding tool to prevent frame deformations during welding process.



- Welding tool (See page.80) can be used to prevent deformation during the welding.

- Start welding the frame with a sealing fillet weld on the backside. Follow appropriate welding sequence. This welding throat should not excess of 3mm.

The interpass temperature should not exceed 200°C for mild steel and aluminium and 150°C for stainless steel.



$$\text{Heat Input (KJ/mm)} = \frac{V \cdot I \cdot \eta}{\text{vel} \cdot 1000}$$

$V = \text{volts} / I = \text{amperes} / \text{vel} = \text{mm/s}$

$\eta = \begin{cases} 1 & \text{SMAW} \\ 0,8 & \text{GMAW / FCAW} \\ 0,6 & \text{GTAW} \end{cases}$

	Máx. Heat Input (KJ/mm)		
	Mild Steel	Stainless Steel	Aluminium
a = 3 mm	1,2	1,1	2

- Grind off weld tacks before start filled weld. Weld runs should not start or stop at a tack weld but should run over a tack.

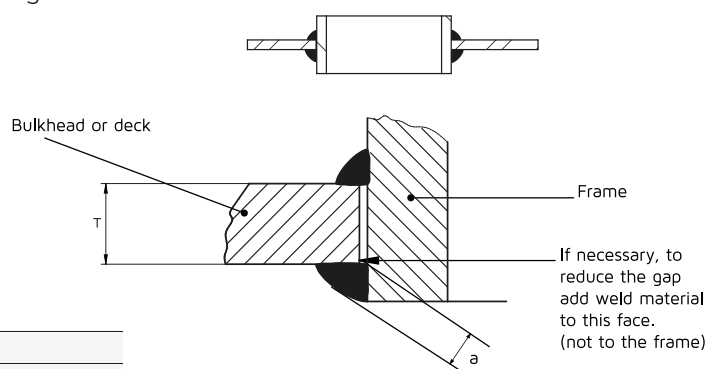
Follow same welding sequence for correct procedure. The interpass temperature should not exceed 200°C for mild steel and aluminium and 150°C for stainless steel.

This welding throat should not excess following values:

$T > 7\text{mm}$	$a = 5\text{mm}$
$T \leq 7\text{mm}$	$a = 4\text{mm}$

■ Max Run Lenght

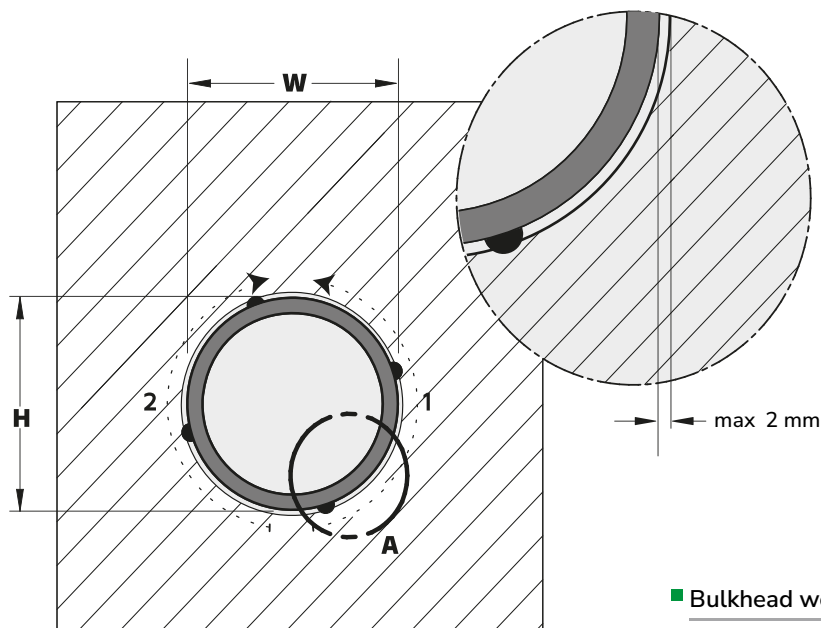
Mild Steel	200 mm
Stainless Steel	150 mm
Aluminium	200 mm



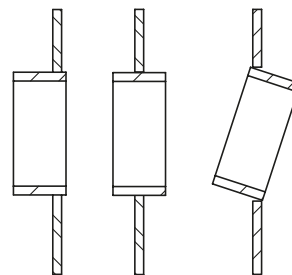
	Máx. Heat Input (KJ/mm)		
	Mild Steel	Stainless Steel	Aluminium
a = 4 mm	1,2	1,1	2
a = 5 mm	1,4	1,1	2

SLEEVES WELDING INSTRUCTIONS

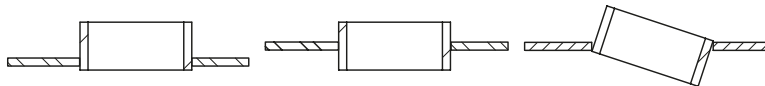
1. Check the measures of the precut hole and external dimensions of the frame. Recommended gap around the frame is in between 1mm and 2mm (0.5-1mm on every side of the frame).



Bulkhead welding positions

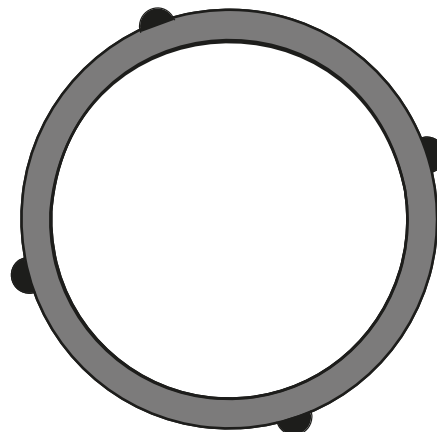
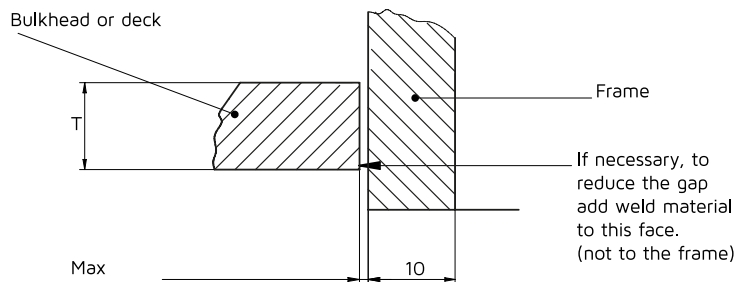


Deep welding positions



2. Tack weld on the front side, centring the frame onto the cut-out hole:

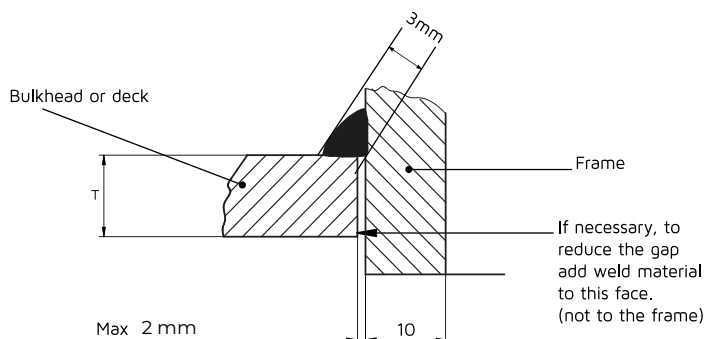
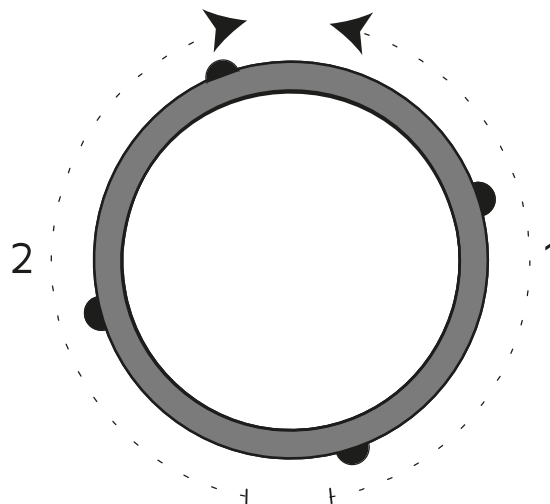
Check the gap measures all around the frame are maintained. If necessary, add weld material to the bulkhead/deck to reduce the gap (not to the frame)



- Start welding the frame with a sealing fillet weld on the backside. Follow appropriate welding sequence. This welding throat should not exceed 3mm.

The interpass temperature should not exceed 200°C for mild steel and aluminium and 150°C for stainless steel.

■ Max Run Length	Mild Steel	200 mm
	Stainless Steel	150 mm
	Aluminum	200 mm



$$\text{Heat Input (KJ/mm)} = \frac{V \cdot I \cdot \eta}{\text{vel} \cdot 1000} \quad \eta = \begin{cases} 1 & \text{SMAW} \\ 0,8 & \text{GMAW / FCAW} \\ 0,6 & \text{GTAW} \end{cases}$$

$V = \text{volts} / I = \text{amperes} / \text{vel} = \text{mm/s}$

	Máx. Heat Input (KJ/mm)		
	Mild Steel	Stainless Steel	Aluminium
$a = 3 \text{ mm}$	1,2	1,1	2

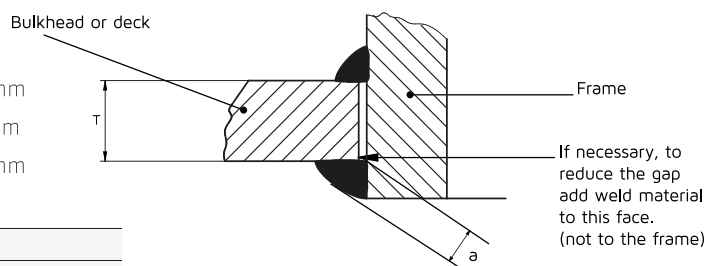
- Grind off weld tacks before start filled weld. Weld runs should not start or stop at a tack weld but should run over a tack.

Follow same welding sequence for correct procedure.
The interpass temperature should not exceed 200°C for mild steel and aluminium and 150°C for stainless steel.

This welding throat should not exceed following values:

$T > 7 \text{ mm}$	$a = 5 \text{ mm}$
$T \leq 7 \text{ mm}$	$a = 4 \text{ mm}$

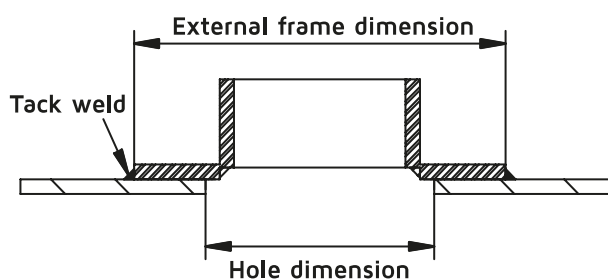
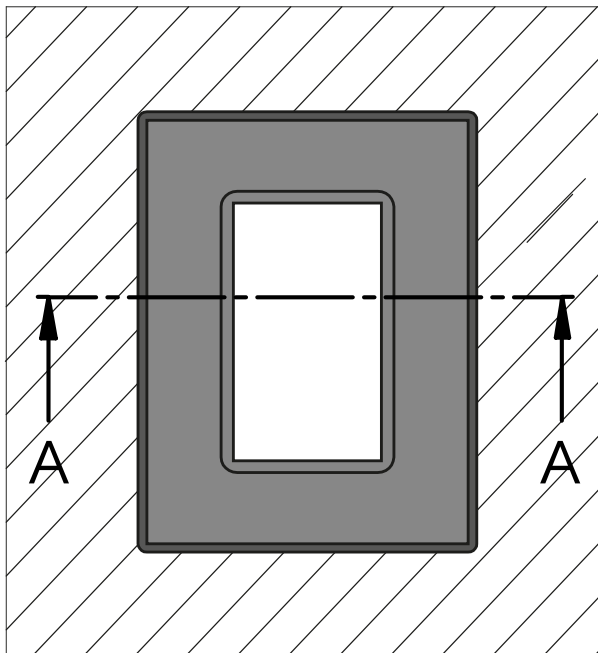
■ Max Run Length	Mild Steel	200 mm
	Stainless Steel	150 mm
	Aluminum	200 mm



	Máx. Heat Input (KJ/mm)		
	Mild Steel	Stainless Steel	Aluminium
$a = 4 \text{ mm}$	1,2	1,1	2
$a = 5 \text{ mm}$	1,4	1,1	2

HMFX WELDING INSTRUCTIONS

1. Tack weld on the front side, centring the frame onto the cut-out hole.
Same as step 2 of standard welding instructions.



Minimum hole dimension	=	(external HMFX dimensions)	less 110mm
Maximum hole dimension	=	(external HMFX dimensions)	less 10mm

2. Grind off weld tacks before start filled weld. Weld runs should not start or stop at a tack weld but should run over a tack.

Follow same welding sequence for correct procedure.

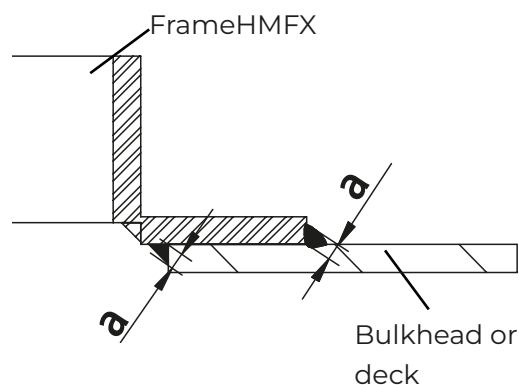
The interpass temperature should not exceed 200°C for mild steel and aluminium and 150°C for stainless steel.

This welding throat should not exceed following values:

$$\begin{aligned} T > 7\text{mm} & \quad a = 5\text{mm} \\ T \leq 7\text{mm} & \quad a = 4\text{mm} \end{aligned}$$

■ Max Run Length

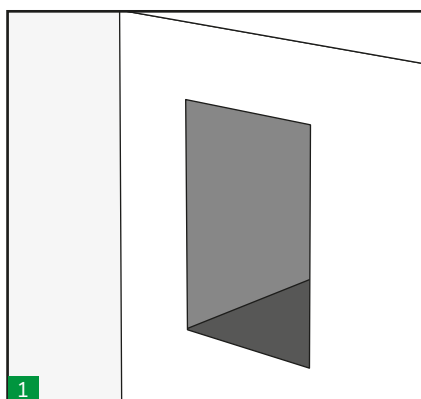
{	Mild Steel	200 mm
	Stainless Steel	150 mm
	Aluminium	200 mm



$$\text{Heat Input (KJ/mm)} = \frac{V \cdot I \cdot \eta}{\text{vel} \cdot 1000} \quad \eta = \begin{cases} 1 & \text{SMAW} \\ 0,8 & \text{GMAW / FCAW} \\ 0,6 & \text{GTAW} \end{cases}$$

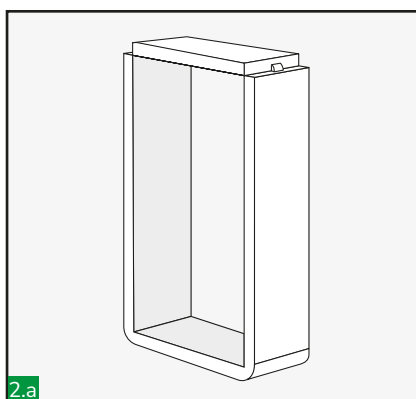
$V = \text{volts} / I = \text{amperes} / \text{vel} = \text{mm/s}$

	Máx. Heat Input (KJ/mm)		
	Mild Steel	Stainless Steel	Aluminium
a = 4 mm	1,2	1,1	2
a = 5 mm	1,4	1,1	2

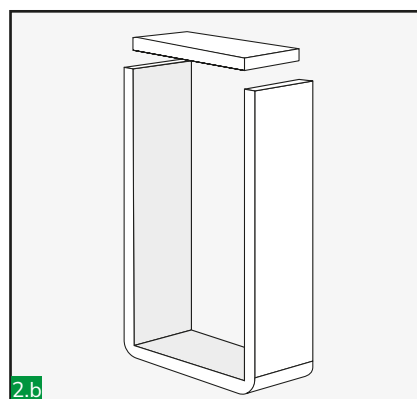


1

Ensure Hole cut is dimensionally in accordance with the standard HMX frames welding instructions

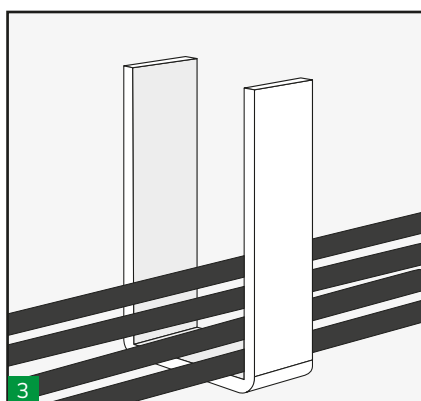


2.a



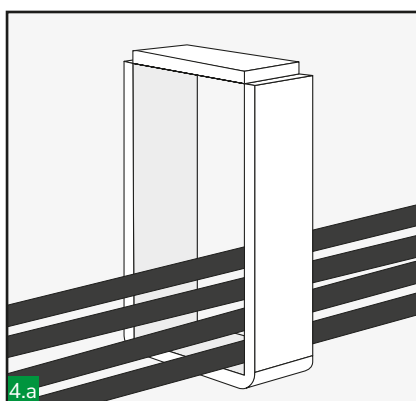
2.b

Break tack welds and remove end piece from the frame.

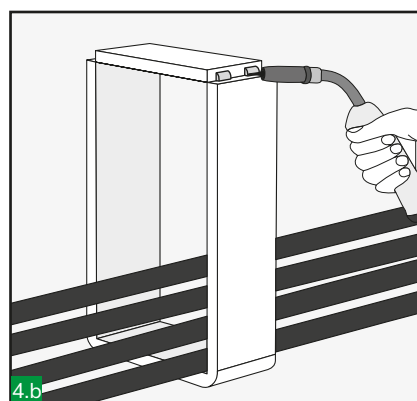


3

Place frame around cables. Tack weld end piece back into place. End piece should be centred in the lateral bars.

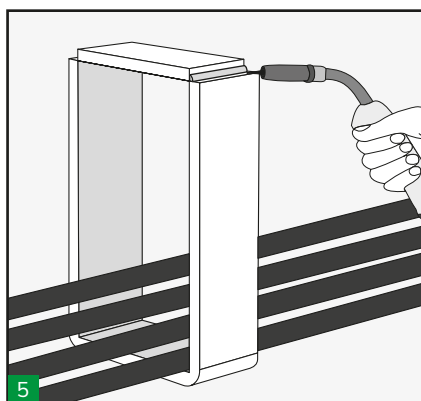


4.a



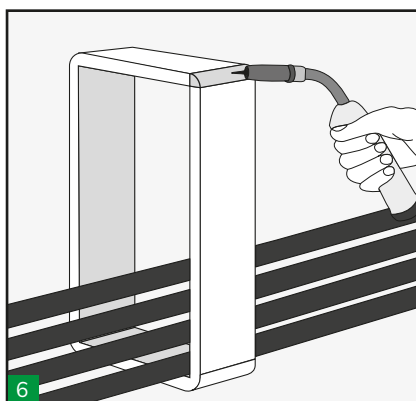
4.b

Tack weld end piece back into place. End piece should be centred in the lateral bars.



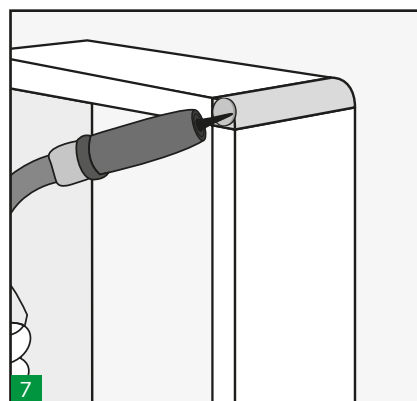
5

Run root fillet weld for full width of frame.



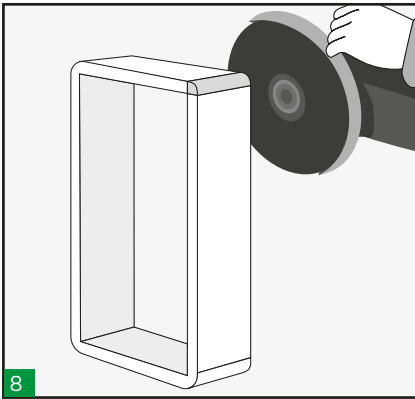
6

Final weld to form full radius at corners of frame.

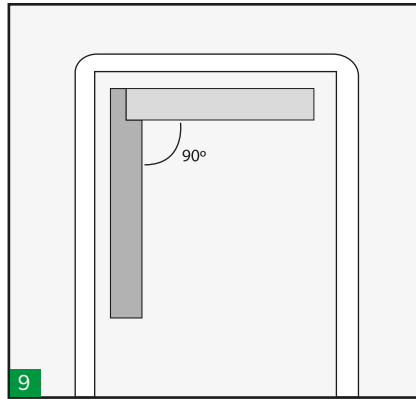


7

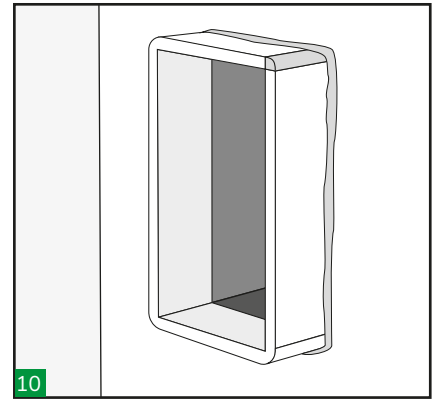
Clean both ends of weld/frame and spot weld them to ensure seal. Weld should not penetrate inside the corner of the frame.



Dress welds.



Check for squareness and parallelism.



Weld frame in position in accordance with Rectangular frame HMX welding instructions and seal the frame in accordance to rectangular system installation guide.

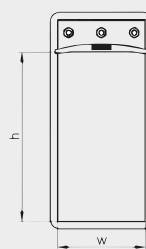


Notes

Leave the system at least 24 hours before apply pressure. For disassembly see disassembly installation instructions.



Sealing Area



APERTURE SIZE	SEALING AREA (w x h)
1	60 x 60
2	120 x 60
3	60 x 120
4	120 x 120
5	60 x 180
6	120 x 180
7	60 x 240
8	120 x 240