

Welding instructions for MTG Systems

GENERAL INSTRUCTIONS

Cleaning and preliminary preparation

First of all, clean the parts to weld. The target is to remove paintings, greases, oxides and other elements which can produce blowholes in the welding stage or another problems. To do this in the right way, use a metallic brush or light grinding.

Preheating

Its principal target is to prevent cracks. To avoid them, preheat and keep the area to be weld, between 140-180°C.

We recommend to use a gas torch, and control temperature with tempersticks or contact or radiation pyrometers.

Maximum Temperature and final check

During the welding process, do not go over 250°C, except the direct affected parts. The best method to keep the temperature within these limits, is to space each run.

When finishing the welding, it is essential to check the quality of the surface of the filler material and the absence of defects. The surface of beads must be as flat and regular as possible. Grind the irregularities, avoiding parallel grinding lines to the beads.

Covered electrode procedure

If you use covered electrodes, we recommend to use basic covered electrodes with a low-hydrogen content.

Diameter: use the bigger diameter as possible, 6 mm is suitable. Types: UNE-EN 499 E 42 B or UNE-EN 499 E 46 B; AWS A5.1 E-7016 or AWS A5.1 E-7018

Amperage and Polarity: follow manufacturer's instructions.

Weld must be done with short beads and a maximum oscillation of three times the diameter of the electrode. Completely remove the slags and lightly hammer the bead to reduce tensions after each run.

Basic cover absorbs humidity. To avoid this, we recommend to stock electrodes in the original packaging hermetically sealed. Once opened, keep them heated within 65-150°C.

GMAW procedure (Gas Metal Arc Welding)

When it is done with gaseous protection, for moderate thickness and requirement welding, we recommend to use welding wire with solid thread. For high thickness and high requirement welding, use welding wire of tubular thread (Flux-core).

- Welding wire of solid thread

Diameter: 1,6 mm [maximum recommended]

Types: UNE-EN 440 type G 46 M or G 50 M; ASME/AWS ER 70 S-6; DIN 8559 SG2; and equivalents.

Gas protection flow: 12-18 liters per minute.

- Welding wire of tubular thread (Flux-core)

Types: ASME/AWS ER 70 T1 (rutile type); ASME/AWS E 70 T5 (basic type); DIN 8559.

With both types of welding wire, the welding must be done with a maximum oscillation of 10 mm. Lightly hammer the bead to avoid residual stresses after each run. It is very important to avoid draughts to protect the gas.

For the highest thickness and requirement welding, use welding wire of tubular thread (Flux-core) with low-hydrogen content, type DIN SG B1 C5254.

FLUSH ADAPTERS

Besides the general instructions...

Previous preparation

Before starting to weld, ensure its right positioning to the blade.

Procedure

Put the adapter on the blade to ensure its right fitting with the lip of the blade. Do tack welds in the adapter in the right position.

- Welding the upper part

Position the bottom bead by half a leg and go backwards until you reach the same level on the opposite side. (Fig. A, num. 1).

Continue from the edges of the lip until joining the previous bead. (num. 2).

Carry out the same operation on the other side. (num. 3).

Make alternative runs repeating the same process until the chamfer cover thickness is more than 1 mm. If the chamfer does not reach the frontal edge of the blade, weld in this zone with beads of equal thickness. Make non-equal beads. The longer part must be on the blade.

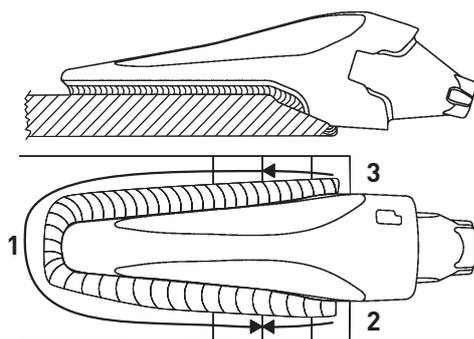


Fig. A: Flush Adapters

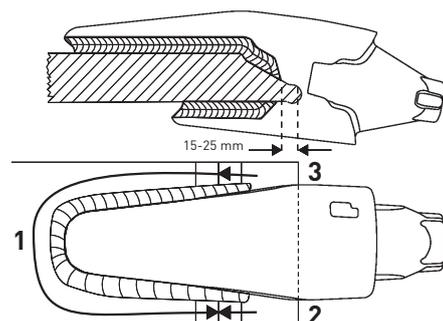


Fig. B: Two Strap Adapters

- Welding the lower part

Weld the lower part, from the adapter to the edge of the lip, as thick as the superior beads, never less.

TWO STRAP ADAPTERS

Besides the general instructions...

Procedure

Put the adapter on the blade to ensure its right fitting with the lip of the blade. Do tack welds in the adapter in the right position.

- Welding the upper strap

Position the bottom bead by half a leg and go welding backwards until you reach the same level on the opposite side (Fig. B, num. 1). Continue from the edges of the lip until joining the previous bead (num. 2 and 3).

Above all, make sure not to weld in the front side of the lip. It is necessary to start welding 15-25 mm (depending on the sizes) from the edge of the blade. Repeat the same process until the chamfer cover thickness is more than 1 mm. Remember to weld thicker beads in the blade.

- Welding the lower strap

Weld the lower strap, starting 15-25 mm from the edge of the blade backwards the strap. Go on making beads until completing the welding.

Final surface must be flat or slightly convex. The bead must be a little bit thicker on the side of the blade.

UNIVERSAL ADAPTERS

Besides the general instructions...

Procedure

Put the adapter on the blade to ensure its right fitting with the lip of the blade. Do tack welds in the adapter in the right position.

- Welding the long lower strap

Weld the lower strap starting by half a lower strap until reaching the same level in the opposite side (Fig. C, num. 1).

Then weld starting 15-25 mm (depending on the size) from the edge of the blade backwards the strap completing the welding). Watch out, not to weld the edge of the blade (num. 2 and 3). Repeat the same process until the chamfer cover thickness is more than 1 mm.

- Increasing the thickness of the frontal part

In the front side near the the lip of the blade in a length within 40-80 mm (depending on the size), increase the thickness of the weld bead until almost reaching the thickness in the back side of the strap. To do this, make alternative beads on both sides, doing a gradual transition between both thickness. Make non-equal beads. The thicker part must be on the blade.

- Welding the short strap

Weld the short strap, starting 15-25 mm from the edge until completing the bead on the other side. It has to be done until reaching a thickness similar to the thicker part of the long strap.

Final surface must be flat or slightly convex. The bead must be a little bit thicker at the edge of the blade.

WELD-ON NOSES

Besides the general instructions...

Previous preparation

The base where you are going to weld the nose must be of similar size and shape to the base of the nose .

Procedure

- Place the nose

First of all, place the nose and make tack welds.

- Place a tooth

Place the tooth on the nose, to check and correct the alignment.

- Welding

Make some beads. Remove the tooth before it is affected by the welding heat and when the number of beads are enough to keep both parts strongly stuck. Weld with alternative runs (from 3 to 5) in both sides, to avoid deformations. Keep on doing the same, until completing the welding. The chamfers must be completely filled up, and the filler material must go lightly over the nose profile (Fig. D).

Check the superficial quality of the filler material and the lack of defects.

The surface of the beads must be the more flat and regular as possible. If necessary eliminate irregularities by grinding. Grind in a longitudinal way.

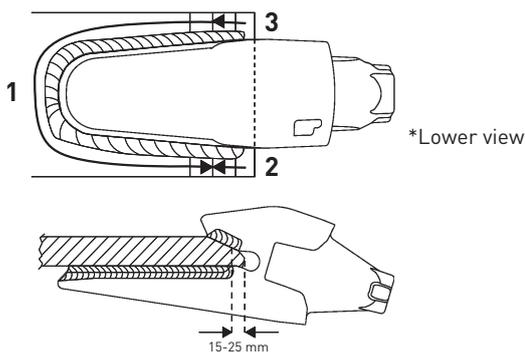


Fig. C: Universal Adapters

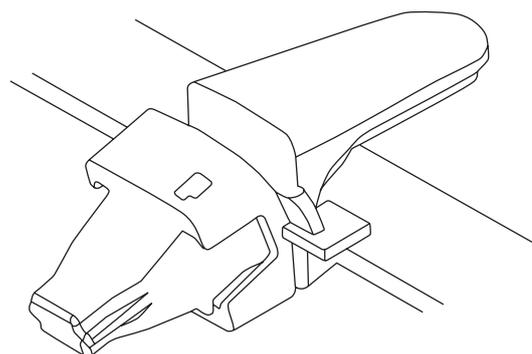


Fig. D: Weld-on Nose