

## MAXI-TUBE® & Stainless Steel

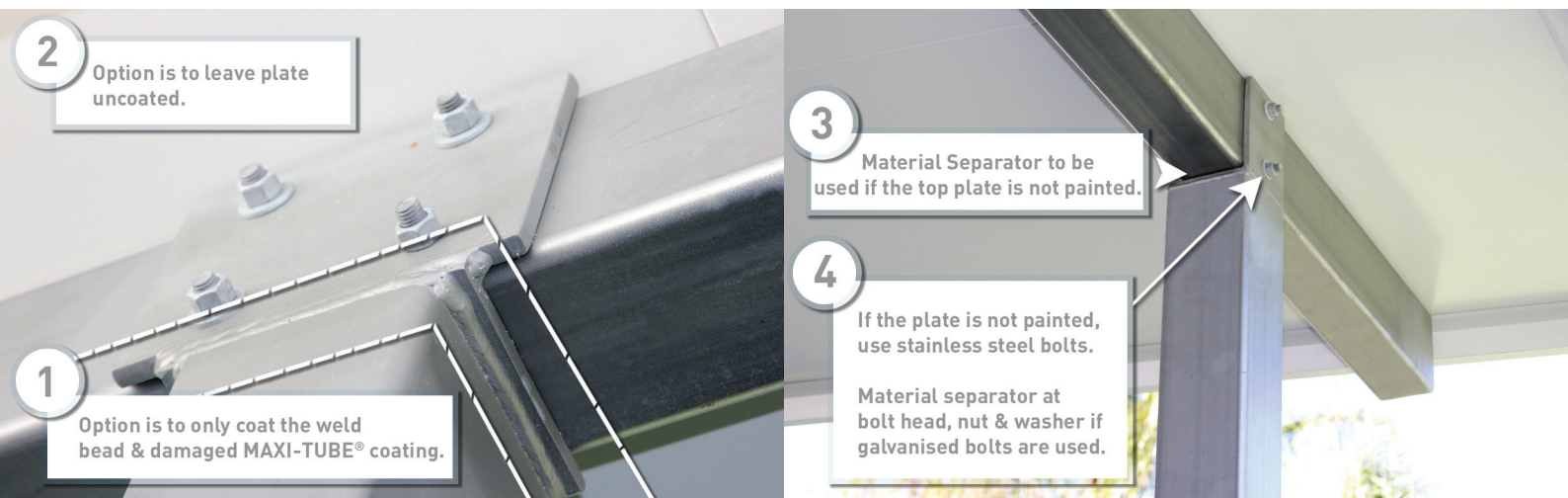
Stainless Steel cleat attachments on MAXI-TUBE® provide the best outcome for the fabricated mill finish market. The method of welding stainless steel plate to MAXI-TUBE® was suggested by fabricators as it saves time and provides a high quality product. The fabricator controls the schedule, quality, supply chain, and cuts out the dependency on third party coating processes.

## Repair of MAXI-TUBE® & Coating Weld Area

The stainless steel weld bead and affected stainless zone would need to have the standard stainless steel passivation and clean up that is normally carried out. The damaged MAXI-TUBE® coating zone and stainless steel weld bead will need to be surface prepared as per paint manufacturers specifications which could include the 3M Clean & Strip disc or a Bristle Blaster. The weld bead and damaged MAXI-TUBE® coating will need to be coated with either a Zinc rich epoxy, Surface tolerant epoxy or MAXI-TUBE® Metal spray base coat and then coated with a MAXI-TUBE® Grey finish coat colour match. The coating of the weld bead prevents Bi-Metallic corrosion. (see page 2)

The Stainless Steel plate could be left uncoated if accepted architecturally by the end client or specifier. The Stainless Steel plate would only be coated with the same epoxy base coat as the weld zone if the MAXI-TUBE® Grey finish coat is required to be coated over it for aesthetic reasons.

Indications are that some zinc rich epoxy paints do not adhere to Stainless Steel Plate very well and the Stainless may need to be abrasive blasted. Another option would be to use a surface tolerant epoxy over all areas including the damaged MAXI-TUBE®, weld bead, and if required for aesthetics the stainless plate. The reason for this is surface tolerant epoxy needs minimum surface preparation compared to zinc rich epoxy.

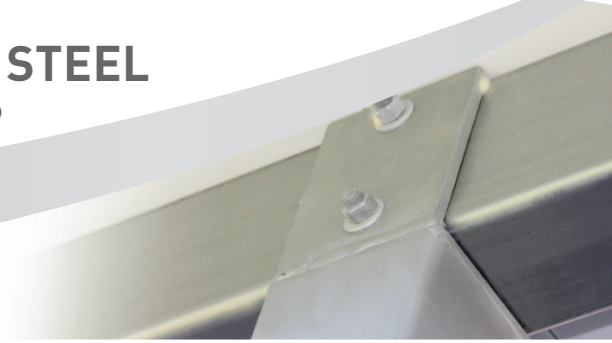


## Colour Match of MAXI-TUBE® & Weld Area

The repaired MAXI-TUBE® and stainless steel weld bead will need to be coated with the MAXI-TUBE® Grey finish coat colour match to make it more aesthetically pleasing following the protective base coat being applied. The Stainless Steel plate attachment would only have a base epoxy coat and finish coat of MAXI-TUBE® Grey applied for specific aesthetic reasons. The MAXI-TUBE® Grey cannot be applied directly to stainless steel without a base coat being applied.

**Note:** Consult with your preferred paint supplier for the approved surface preparation and paint coating specification according to the project environment location.

**Note:** MAXI-TUBE® Grey is only a colour match and must always have a protective base coat beneath it to protect the repaired MAXI-TUBE® and weld area.



## Weld Procedure – Welding to Stainless Steel

The combination of galvanized steel and austenitic stainless steel such as type 316 tends to cause LMEC ( Liquid Metal Embrittlement Cracking) to occur easier. Because austenite has different thermal expansion rates from that of ferrite, austenite has a tendency for LMEC to occur.

Stainless Steel Type 304, Type 316--- Austenite  
Galvanized Steel , ZM 275 coating on MAXI-TUBE® (Carbon Steel)---Ferrite

All Zinc coated steels in general, i.e. HDG, Pregal, Allgal and ZM-class coated steels are susceptible to LMEC cracking. We recommend to remove the ZM275 coating layer on MAXI-TUBE® to avoid LMEC cracking before welding by use of a grinder. For welding gas you can use 100 % Argon. Argon gas containing approximately 2% Oxygen is better if you can obtain this welding gas. The normal passivation process required for stainless steel welding should also be carried out.

## Welding Consumables Recommended:

### MIG Wire Specification

• International Standards (AWS A5.9 ER309L) 25Cr-12Ni-Low C - this is preferred as easier to weld to mild steel with this than the ER 316L.

• BOC Stainless Steel MIG Wire 309LSi

### Electrode Specification

• BOC Smootharc S 309L

**Note:** The weld zone material effectively becomes a 304 Grade Stainless Steel. (extra Silicon gives better weld shape).

Optional Specification (309 consumables noted above are recommended as a preference to this below:)

- International Standards (AWS A5.9 ER316L) - 18Cr-12Ni-2Mo-LowC
- BOC Stainless Steel MIG Wire 316LSi
- BOC Electrode Smootharc S 316

## Prevention of Bi-Metallic Corrosion

The welding of stainless steel to carbon steel is common practice in the construction industry. Bi-metallic corrosion may occur between ZM 275 and stainless steel type 316 or 304, when these materials are installed in heavy humidity or constantly wet conditions.

The British Stainless Steel Association outlines how to prevent the bi metallic corrosion bridge by painting over the stainless weld bead. The key thing would be to ensure the paint bonds to the weld bead so adequate surface preparation would be required. The paint companies will be able to offer advice with painting over stainless steel. Refer to this link and the extract from the BSSA website below.

<http://www.bssa.org.uk/topics.php?article=101>

When the stainless steel plate is not coated with paint, refer to the design detail noted in both images on page 1 of this fact sheet.