2.14 Prevention of Unwanted Galvanized Coating

1. General

When galvanizing a steel fabrication it may be desirable that certain areas are not coated with zinc. However, this can be expensive to achieve as hot dip galvanizing is an immersion process and therefore all areas of the steelwork will be in contact with the molten zinc.
The areas that it is desirable not to coat may have special functions to perform, such as:
- threaded bolts on a fabrication
- mating surfaces which have fine tolerances
- drilled holes
- surfaces which must be welded after the galvanizing process.

There are different methods that can be used to keep steelwork free of zinc depending upon the intended use of that area.

2. Gauze tape

To protect cylindrical components such as threaded bolts and pins from the molten zinc a proprietary gauze or cloth based tape should be tightly wrapped around the relevant area (fig.1a). Plastic insulation tape is not suitable. The temperature in the galvanizing bath will cause the gauze to burn but the carbon residue remaining will be sufficient to keep the zinc from the steel.
After galvanizing the carbon residue must be removed (e.g. by wire brushing).
Gauze or cloth tape is not suitable for protecting flat areas.

3. Covering materials

To protect flat areas from molten zinc specialist covering materials must be used. These will be destroyed by burning like the gauze tapes mentioned above but the carbon residue will prevent the formation of a zinc coating. Again, the carbon residue must be brushed away after galvanizing.
Another method is by the use of high temperature paints (such as those used in the motor trade to protect exhaust systems). These paints can be used to protect flat areas from being galvanized (fig. 1b).
It is also possible to obtain special high temperature coating materials in the form of pastes from specialist suppliers. In order to achieve a complete covering it will be necessary to follow the manufacturers' recommendations and to apply sufficient thickness of materials.

4. Pastes

Pastes are particularly good at protecting bore holes or internal threads. The types of pastes sold by the motor accessory trade for sealing small holes in exhausts are very suitable.

Fig. 1a: Wrapping threaded bolts with a cloth based tape will protect them from being zinc coated.

Fig. 1b: Wire brushing afterwards removes the carbon residue.

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When moistened with a little water these pastes can be pressed into holes and openings but care must be taken not to trap air inside (fig. 3). The paste hardens with the heat of galvanizing and prevents ingress of zinc.
Obviously, it will be necessary to remove the residue after galvanizing.

5. Other methods

Internal threads can also be protected by inserting a suitable bolt which has been greased previously. After galvanizing the bolt may need loosening by use of a small gas torch as it will probably be soldered in place.
Threaded holes can also be sealed off by wooden plugs. Here too the wood will be carbonized by the heat of the molten zinc but it will still prevent ingress of zinc. However, the sooty residue of the carbonized wood may affect the zinc coating near the protected area.
In each case, masking off surface areas before hot dip galvanizing will incur additional costs but the methods described above will also ensure that it is not necessary to grind or burn off surplus coating after galvanizing.

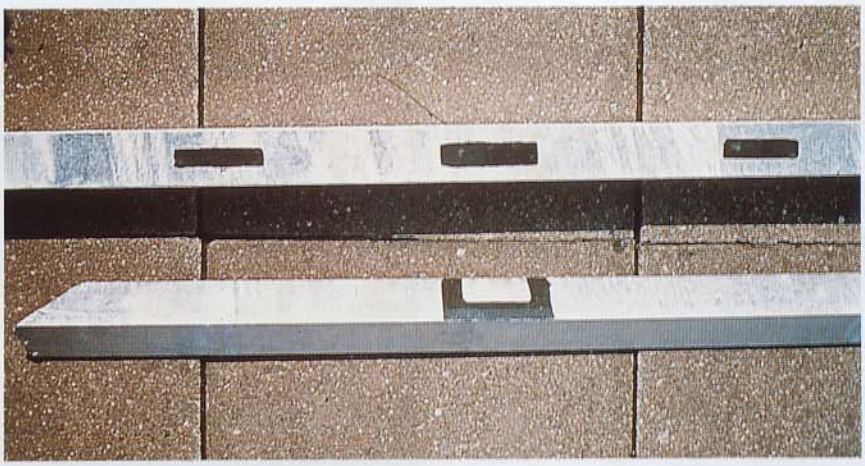

Fig. 2: Heat resistant coatings keep special areas clear.

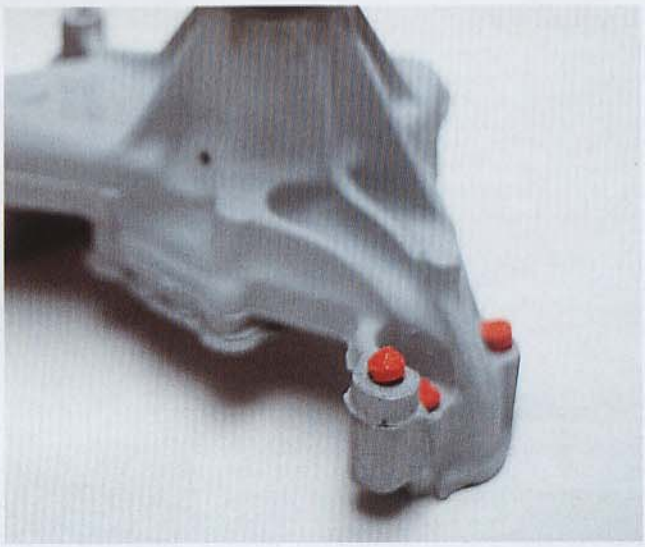

Fig. 3: Internal threads can be protected by using special pastes.

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