

4.2 Finishing and Fitting of Hot Dip Galvanized Components

1. General

Corrosion protection by hot dip galvanizing is usually the last stage of the production process but the transport and storage of steel components (see Data Sheet 4.1), together with any further treatment and fitting are also part of this final stage. Specialist knowledge is required here in order to avoid compromising the integrity of the galvanized coating and hence its corrosion protection. At the same time, the corrosion protection should not affect the function of the component.

2. Effective measures

Although hot dip galvanized steel components can be supplied at a consistent high quality, it may be necessary to carry out some finishing operations before installation in order that they function correctly. Under certain circumstances some additional work may be necessary after installation as well.

2.1 Drill hole clearances

In order that assembly or fitting after galvanizing is problem free, it is important that sufficient allowance is made beforehand for the zinc coating. Whilst this coating is nominally only 0.1mm thick, the high surface tension of molten zinc causes a much greater build-up in drill holes, perforations and the like than on smooth, level surfaces. If possible, a clearance of approximately 2 mm should be allowed before galvanizing.

2.2 Drips and runs

The hot dip galvanizing process involves immersing the steelwork in a bath of molten zinc. After withdrawal from the bath the steelwork begins to cool and the liquid zinc begins to solidify. As it does so, it leaves some small runs just visible at the point where the zinc drips off. As these do not affect the performance of the coating there is usually no need to remove them. However, as far as assembly and fitting of the component is concerned, they can sometimes cause problems.

The drips can be removed by filing or grinding so that the components can be assembled, but care must be taken that not too much zinc is removed. It may be useful to remove droplets by melting them with a gas torch. The molten zinc will either drip off again on its own or can be removed with the help of a wire brush or metal spatula (fig. 1). Sufficient zinc will be retained on the surface to provide adequate corrosion protection.

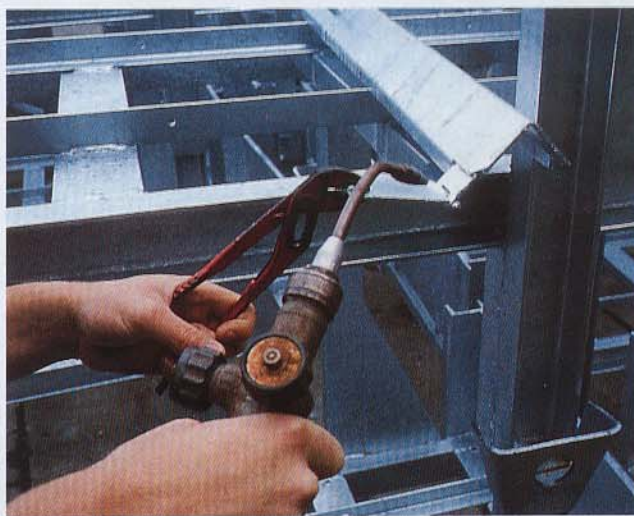
2.3 Hinges and joints

It is recommended that steel components containing hinges, joints and other movable parts are galvanized separately and assembled later. If this is not possible, it must be re-

Fig. 1: Zinc runs can be removed by reheating the area and then brushing off superfluous zinc or removing it with a spatula.



Fig. 2: Firmly soldered hinges can be freed up by careful use of a gas torch.



membered they will go solid when cold and require considerable force to loosen them. If this happens a gas torch will help to remelt the zinc at the affected area (fig. 2). By continuously moving the part after the flame has been removed hinges and joints will remain free and can be used as normal.

2.4 Threaded bolts

If the steel fabrication contains threaded bolts that are required to be left ungalvanized it is possible to treat the threads before galvanizing to protect them from the zinc. Otherwise, the threads will fill with zinc and may not be suitable for use.

If it is required to have a zinc coating on the threads and still ensure that they are usable after galvanizing this can be achieved by the use of heat. The threaded area is carefully

heated using a gas torch until the zinc melts (but it must not be overheated or it will vaporise). Then the thread can be brushed with a wire brush and the excess zinc removed (fig. 3).

This method will only be effective if there is sufficient clearance on the thread to allow room for the zinc coating. If there is insufficient clearance the only thing to do is to cut another thread after galvanizing.

2.5 Repairing damaged areas

Sometimes hot dip galvanized articles may sustain damage during assembly or transportation. Even any welding needed during assembly will cause unavoidable damage. If this happens these areas must be repaired later so that there are no weak points in the corrosion protection.

4.2 Finishing and Fitting of Hot Dip Galvanized Components



Fig. 3: Threads can be cleaned by reheating so that the zinc melts followed by brushing.



Fig. 4: The remains of welding rods can be the cause of "phantom rust".

After careful cleaning and, if necessary, removal of corrosion products the damaged areas in the zinc coating can be repaired by:

- zinc spraying
 - coating with a layer of a zinc rich medium.
- Other processes are also available. More details about action to be taken can be found in BS 729: 1971 (1986), and the forthcoming European specification or from Data Sheet 2.12 of this series.

2.6 Problems caused by sparks from grinding and swarf from drilling

The assembly of hot dip galvanized components often involves grinding and drilling which

can cause damage to areas other than those where the operation takes place. This is especially true if grinding work is being carried out near hot dip galvanized components. Hot sparks, glowing brightly from the grinding wheel, fly onto the galvanized surface and, due to their intrinsic energy, burn deep into the zinc coating. In damp weather these iron particles will corrode and discolour the affected area turning it reddish-brown. This can be avoided by taking special care when carrying out grinding work by, for instance, providing protective screens to catch the sparks.

Swarf from drilling or the remains of welding electrodes will also cause rusty discolouration if they are allowed to remain on the galvanized surface. The presence of moisture leads to

"phantom rust" that can, however, be removed relatively easily by brushing (fig. 4).

3.0 Planning ahead

Any additional work must be allowed for at the planning stage. If this is done then the additional expense incurred can be kept to a minimum. It is recommended that early contact be established with the galvanizer so that any special requirements or post galvanizing work can be catered for.