

Is white rust harmful? What action is required? Because of the large volume of white rust often apparent, it frequently gives the misleading impression of extensive corrosion. However, in the vast majority of cases, white rust does not indicate serious degradation of the zinc coating nor does it necessarily imply any likely reduction in the expected life of the product. Unless the sheets or components are to be over-painted later, superficial white rusting can be safely ignored. In most cases, when exposed to natural, acceptable environmental conditions, superficial deposits of white rust will gradually 'tone-in' and eventually disappear. However, heavy deposits, especially when combined with other corrosion phenomena, should be regarded with caution. The advice applies particularly to continuously galvanized steel, but in many respects relates also to products galvanized after manufacture. However, in the latter case, specific advice should be sought from the supplier involved.

Note: Where subsequent over painting is required, white rust deposits must always be removed, otherwise they will impair paint adhesion. The remedial actions recommended assume that the galvanized steel is not to be painted or otherwise coated.

Light white rust: Visible effect: thin, white, powdery deposit **Cause:** Typically caused by moisture trapped between sheets or components during transport or storage, or by condensation.

Remedial action: None required. The protective properties of zinc are not impaired by the presence of superficial white rust. Existing white rust deposits will slowly convert to protective basic zinc carbonate.

Removal: Where it is essential to remove white rust deposits, this can be achieved by using special proprietary cleaners or simple chemical solutions, which can be made up, on site. A suitable solution could be: 1 % solution of trisodium phosphate (NA3PO4) or 1 % solution of potassium or sodium dichromate slightly acidified with sulphuric acid (PH not less than 6). This solution may leave a stained surface. N.B. In all cases, affected sheets should be thoroughly washed and allowed to dry after treatment. **Heavy white rust:** Visible effect: thick, crusty deposit

Remedial action: Remove small area of white rust by brushing with a stiff-bristled brush (not a wire brush). Check residual zinc coating thickness with magnetic gauge. An average of at least 3-point determinations should be taken in each case. If within specification, and if the sheet or component is to be used in reasonably dry or freely exposed conditions, no action is required. However, if the sheet or component is to be exposed to excessive condensate or to conditions where moisture can be retained, the deposits must be removed. If below specification, clean the area and treat with an inorganic zinc-rich paint to a minimum dry film thickness of 25µm.

Notes:

1. Simple hand-held magnetic thickness gauges suitable for the on-site or factory- floor measurement of residual zinc coating thickness are available from a number of companies.
2. Coating weight should correspond to the relevant specification according EN 10346, Continuously hot-dip zinc coated structural steel strip and sheet.
3. Small areas of white rust can be removed by abrading with a stiff-bristled brush. Large areas can be treated with a proprietary product or with simple chemical solutions which can be prepared on site.
4. Where wet conditions are likely to persist, over painting with a suitable paint system should be considered as an added protection.