



Technical Information: Galvanizing

The primary use of galvanizing is to prevent corrosion in steelwork. Due to the process and factors outwith the galvanizers control, such as steel composition and design, there are number of appearance features that are acceptable in ISO 1461 as they will not affect the protection performance of the zinc coating.

A list of common appearance features and their acceptability appears below.

- **Variation in Finished Colour** – the colour of hot dip galvanizing can range from a bright shiny silvery grey to dull dark grey. The main influence of colour is the thickness of the metal with thicker sections usually being duller and darker. Other factors affecting colour are the silicon content of the steel and the time the metal spends in the molten zinc. Due to these reasons, it is not uncommon for single fabrications to have colour variations. The colour appearance is outwith the control of the galvanizer and therefore variations are acceptable in ISO 1461. Colour variations are more pronounced in the days and weeks after galvanizing, after around 6 months the surface will oxidise leading to a duller more uniform appearance.
- **Rust Staining** – Galvanized steel can sometimes look as if it is rusting, giving the impression that the coating has failed and the steel is corroding. On most occasions this is purely a visual issue with the coating being unaffected. It is often caused by process residues escaping from welded areas and is known as ‘weld weep’. It usually occurs after the fabrication has been exposed to the rain shortly after galvanizing and can be removed with a stiff brush and water. To reduce the occurrence of weld weep, welds should be fully sealed. Rust staining can also result from poorly specified fasteners or from areas where the coating has been damaged after installation.
- **General Roughness** – A rough zinc coating is usually the result of uneven alloy layers or differences in the steel surface condition. For example, if one section of a fabrication has used an older piece of steel then this may result in a variation of surface finishes. Roughness can also be caused by a steel silicon content between 0.05 and 0.15. This can create a heavy coating that is made predominantly of zinc iron alloy. Where smoothness is a priority steel specification should be given full consideration.

- **Lumpiness and Runs** – Under ISO 1461 dross and ash lumps should be removed and the area dressed to ensure that no sharp sections are left. Thicker areas and runs can be caused by uneven or inadequate drainage. They will not affect the performance of the coating and can almost always be eliminated at the design stage.
- **Flux Staining** – Occasionally flux residues adhere to the steel and form a white deposit after galvanizing. These deposits do not affect the performance of the coating and should be removed by the galvanizer.
- **Bare Spots** – These can occur for a variety of reasons such as air traps caused by poor design, faulty processing or impurities in the steel. Small areas can be treated by the application of Zinc rich paint but larger areas should be stripped and reprocessed. The galvanizer should rectify any process issues and contact the customer to discuss any issues outwith their control.
- **Wet Storage Stain** – This is a white deposit, sometimes known as ‘white rust’, that can appear on a galvanizing soon after the item has been coated. It is caused by water being trapped between two galvanized surfaces for a sustained period. The resulting conditions cause a white zinc oxide to be formed on the surface of the galvanizing. The appearance will gradually fade when the galvanizing has been separated and exposed to weathering but if necessary it can be improved by brushing with a stiff brush. Unless very severe the white rust will not affect the corrosion protection of the galvanizing. If material is to be stored outside for any length of time white rust can be avoided by ensuring that the surfaces are not packaged in close contact and that rain is free to drain off the items. If the items are covered air must be free to circulate to prevent condensation and retention of moisture.

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