galvanized articles may require the use of chain slings, wire or other holding devices to immerse the material into the galvanizing bath if suitable lifting fixtures are not provided on the item. Chains, wire and special jigs used to handle the items may leave a mark on the hot dip galvanized item. These marks are not always detrimental and reason for rejection. Should these marks, be greater than 5mm^2 per chain mark and expose the bare steel, suitable repair should be carried out using the procedures indicated in **SANS 121 / ISO 1461.** See also "Coating Repair Procedures".

Differences in the lustre and colour of hot dip galvanized coatings do not affect corrosion resistance and the presence or absence of spangle has no effect on coating performance. The well-known spangled effect found on some hot dip galvanized surfaces is simply a factor of primary crystallisation. It is chiefly dependant upon the zinc bath chemistry, the rate of cooling, the method of pickling, the steel chemistry, and the thickness of the coating. In fact, dull grey or patchy matte grey hot dip galvanized coatings give service lives equal to or greater than bright or spangled coatings. Variations in coating appearance or finish are important only to the extent that they will affect corrosion performance or the intended use of the article. The primary function of a hot dip galvanized coating is corrosion protection. Specific requirements beyond the standard set out in **SANS 121 / ISO 1461**, shall be communicated to the galvanizer in writing or discussed at the contract review, prior to the work being hot dip galvanized.

The information supplied may include –

a) The composition and any properties of the metal that may affect the quality of the hot dip galvanized coating.

b) Identification of significant surfaces. See page 15[B] for definition.

c) A visual standard should be established if a special finish is required.

d) Any particular treatments that are required or not required before or after the process.

e) A variance in coating thickness. See notes below **table 3**.

f) The acceptable method of repair, if this is found to be necessary – see also "Coating Repair Procedures"

Removal of Wet Storage Stain (White Rust)

Although in extreme cases the protective value of the coating may be impaired, wet storage stain attack is often superficial despite the relative bulkiness of the corrosion product. Where surface staining is light and smooth without growth of the zinc oxide layer as judged by lightly rubbing fingertips across the surface, the staining will gradually disappear and blend in with the surrounding zinc surface as a result of normal weathering in service.

When the affected area will not be fully exposed in service or when it will be subjected to a humid environment, wet storage staining must be removed, even if it is superficial. This is essential for the basic zinc carbonate film to form. The formation of this zinc carbonate film is necessary to ensure long term service life.

Light deposits can be removed by cleaning with a stiff bristle (not wire) brush. Heavier deposits can be removed by brushing with a 5% solution of sodium or potassium dichromate with the addition of 0.1% by volume of concentrated sulphuric acid. Alternatively, a 10% solution of acetic acid can be used. These solutions are applied with a stiff brush and left for about 30 seconds before thoroughly rinsing and drying.

Unless present prior to shipment from the galvanizer, the development of wet storage stain is not the responsibility of the galvanizer. The customer must exercise proper caution during transportation and storage to protect against wet storage staining.

Coating Repair Procedures

BY THE GALVANIZER

In terms of **SANS 121 / ISO 1461** a galvanizer may repair a coating by either zinc metal spraying or zinc rich epoxy or paint. The latter method must conform to certain requirements in the specification. The preferred method of repair is by zinc metal spraying. Repair will only be necessary if bare spots are present, usually caused by inadequate cleaning, air entrapment or if mechanical damage has occurred.

The total uncoated areas for renovation by the galvanizer shall not exceed 0,5% of the total area of the component.

For articles equal to an area of 2m^2; 0,5% represents a maximum area of 100cm^2 or 100mm x 100mm.

For articles equal to an area of 10 000mm^2; 0,5% represents a maximum area of 50mm^2 or 7mm x 7mm.

No individual repair area shall exceed 10cm^2 or 10mm x 100mm.

If uncoated areas are greater than 0,5%, the article shall be

regalvanized, unless otherwise agreed between the purchaser and the galvanizer.

Zinc Metal Thermal Sprayed Coatings

Method

The damaged area is to be lightly blasted using preferably a pencil blasting nozzle or the surrounding coating should be masked in order to limit damage.

A zinc metal sprayed coating is then applied to the abrasively blasted surface to a thickness at least 30µm greater than the minimum specified zinc coating thickness, or equal to the surrounding coating thickness, whichever is the greater. The repaired area is then wire brushed (preferably stainless steel) to remove loosely adhering over sprayed zinc. Wire brushing provides the added benefit of sealing the pores that may be present in the sprayed coating.

Zinc Rich Epoxy or Zinc Rich Paint

Method

The defective area shall be blasted as above or abraded with abrasive paper (roughness 80 grit). All dust and debris must be completely removed. In the event of moisture being present, all surfaces are to be properly dried.

A zinc rich paint or epoxy containing not less than 80% of zinc in the dry film (53% by volume), should be applied to a thickness, 30µm greater than the minimum specified for the galvanized coating or equal to that of the surrounding galvanized coating, whichever is greater. The paint coating should overlap the surrounding zinc by at least 25mm.

The preferred product is a two or three component zinc rich epoxy.

SITE REPAIRS

The preferred method of repair is by zinc metal thermal spraying. Due to the remoteness of most sites, however, and the unavailability of metal spraying equipment, repairs by zinc rich epoxy or zinc rich paint have to date generally been more popular.

Site repairs should be limited to small coating defects and areas that have been cut or welded on site.

Should excessive amounts of grease or oil be present at the affected area, it should be removed by means of an approved solvent. All residues are to be thoroughly removed by washing with clean water.

The affected area should then be abraded with abrasive paper (roughness 80 grit) or alternatively thoroughly cleaned using, preferably a stainless steel brush. All dust and debris should be completely removed.

Repair can now be carried out using an approved product.

Single pack zinc rich paints are good materials and can easily be applied. They, however, require several coats to achieve a reasonable repair. Multiple coats will also necessitate longer drying times between coats.

Site Repairs by "Zincfix"

Until recently, the approved products for repair were only available in large containers. Due to the large quantities involved and short pot life when mixed, the products proved to be expensive and wasteful.

A product is now available in a three component, solvent free form, packed for convenience in handy, easy to use squish packs. The repair product is called "Zincfix" and is approved by and available from the Hot Dip Galvanizers Association of Southern Africa and all of its members.

The product has been tested against a number of reputable products and has performed exceptionally well.

Zincfix is available in a 100g squish pack and will coat an area of about 0,25m^2 to a DFT (Dry film thickness) of 100 to 150µm in a single application.

The contents are easily mixed in accurate proportions.