

Hot Dip Galvanized Information Sheet No.12

Hot Dip Galvanizing & Duplex Coating Repair Procedure

(rev. 1- June 2025)



Following SANS 121 (ISO 1461) section 6.3, hot-dip galvanized (HDG) steel may be renovated (repaired) by zinc metal thermal spraying, zinc-rich epoxy (Galvpatch®) or a suitable zinc-rich paint, provided that the repaired surface achieves a minimum coating thickness of 100µm or is equal to the thickness of the surrounding HDG coating.

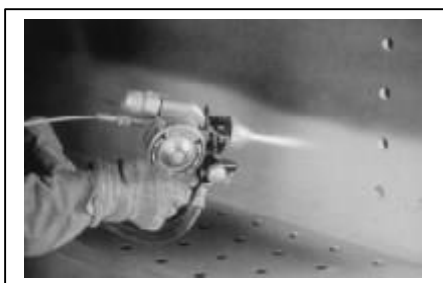
When repairs are considered necessary due to site modifications, mechanical damage and small uncoated areas, such renovations shall not exceed 0.5% of the total area of a component and each individual repair area shall not exceed 10cm². If uncoated areas are larger, the article containing such area shall be re-galvanized unless otherwise agreed between the purchaser and the galvanizer. As a practical guideline, individual repairs should be limited to the approximate area of that covered by two R5 coins side-by-side.

Depending on site locations and contract size, with the limited availability of metal spraying equipment, repairs using zinc-rich epoxy or zinc-rich paint have generally become the method of choice. Generally, the required repair coating thickness specification (100µm) can be achieved using zinc thermal spray or zinc-rich epoxy by way of a single application. Should a suitable zinc-rich paint be employed, it is usual that a series of multiple applications will be required to achieve the specified coating thickness.

THERMAL SPRAYED COATINGS

Method

The area to be repaired is lightly blasted using a small blasting nozzle so as not to damage the surrounding hot-dip galvanized coating. Zinc thermal sprayed coating is applied to the abrasively blasted surface to a zinc thickness of 100µm. The repaired area is then wire brushed, (preferably stainless-steel brush) to remove any loosely adhering over-sprayed zinc. Wire brushing provides the added benefit of sealing pores that may be present in the sprayed coating.



An example of zinc thermal spray
Oxygen and acetylene gas through a
“special gun” through which a zinc wire is fed,
atomized and blasted onto the surface.

ZINC RICH EPOXY or ZINC RICH PAINT

Method

The area to be repaired is lightly blasted using a small blasting nozzle so as not to damage the surrounding hot-dip galvanized coating. Alternatively, the defective area shall be cleaned with abrasive paper (80 grit) or thoroughly cleaned, preferably using a stainless-steel brush. All dust and debris must be completely removed. In the event of moisture being present, all surfaces must be thoroughly dried before applying the repair material.

A zinc-rich epoxy or a suitable zinc-rich paint, containing approximately 80% metallic zinc particles (by volume) in the dry film, should be applied to a thickness of 100µm.

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The preferred site repair material consists of a two-component zinc-rich epoxy to SANS 121 (ISO 1461). In order to provide a limited quantity to meet the needs of a site repair, a squish pack containing epoxy, activator and metallic zinc dust, branded as Galvpatch® was developed. Galvpatch® is available in 100g packets. The quantity of one squish-pack will coat an area of about 0,2 m², to a DFT (dry film thickness) of 100 to 150 µm in a single application. The content is easily mixed in accurate proportions. Once mixed the product will heat up after 10 minutes and must be used within 25 minutes of mixing (pot-life)

Do not attempt to thin Galvpatch® or use the product after the pot-life has been exceeded. The pot-life will be slightly shorter at higher temperatures and longer at lower temperatures. Galvpatch® with its high zinc content is also solvent free and environmentally acceptable.

Galvpatch®, illustrated below, is available from the Hot Dip Galvanizers Association Southern Africa or any one of its member galvanizers.



100 grams of Galvpatch being mixed for site repairs of hot dip galvanized steel

Suitable single pack zinc rich paints are acceptable, are easily to apply, but they all require multiple applications to achieve the specified coating thickness. Multiple coats will also necessitate longer drying times between individual coating applications.

REPAIR OF DAMAGED or SITE ALTERED COMPONENTS WITH A DUPLEX COATING

In the event that a duplex system has been applied and subsequent coating damage has occurred, the damaged coating is to be thoroughly abraded to create a rough profile before overcoating with the appropriate paint.

In the event that the hot-dip galvanized coating beneath the paint coat has been cut or damaged, one of the above coating repair methods must be enforced before any top coats (in accordance with the duplex specification) is applied. Repaired coating thickness shall be equal to the surrounding hot-dip galvanized coating thickness.

A Duplex coating is defined as a base coating of metallurgically bonded hot-dip galvanizing, coated with a suitable paint coating specification. A Duplex system is employed where additional corrosion control is necessary or coloured surfaces and aesthetics are important.