
Protective Coatings**Date: 21-09-09****Project Report / Project number –****Report by: Mahesh Aradhye**

Subject:**Report on "Evaluation of Coating Application on Safe Tool prepared surface ."**

Objective:

Evaluation of Coating Performance of various coatings on the surface prepared with Safe Tools.

Back Ground:

Safe tools are considered to be one of the latest technologies for the Hand- tool surface preparation during maintenance & rehabilitation situations.

Safe tools allow giving surface which is free from rust, strongly adhered coatings & with the surface profile in the range of 30-40 microns.

Coatings do show surface tolerance but its performance strictly dependent on degree of surface cleanliness

Work Approach:

- Surface preparation with Safe tools
- Assessment of surface cleanliness.
- Applications of various coatings on those surfaces.
- Thermal shocks up to 120°C.
- Testing for Adhesion by pull off method.
- Testing cross cut adhesion.

Observations:

1. Surface preparation :

We used Safe tools to prepare panes of following size

- a) 300mm x 300 mm x 5 mm**
- b) 300 mm x 150 mm x 3 mm**
- c) 150 mm x 100 mm x 5 mm**
- d) 150mm x 100 mm x 1mm**

2. Safe tool used



Tool Number A-009 at 2000 RPM

3. Surface finish: We had carried out various substrate & the finish was absolute white metal without the surface getting heated or having more defects such as tool damages on surface.

Surface even though prepared with hand tool was having bright glittering appearance with uniform profile all over .

We purposely carried out some of the panel's preparation by allowing nearly 10 to 20 % of flash rust on few panels



Surface prepared with Safe tools nearing to SA-3 or NACE -1 used for the application of Interzinc 12.



Purposely prepared for application of Intertherm 228

Purposely prepared for application of Intertherm 228



Purposely prepared for the application of Interzone 954



Purposely prepared for the application of Interzone 954



Surface Prepared for Interline 850



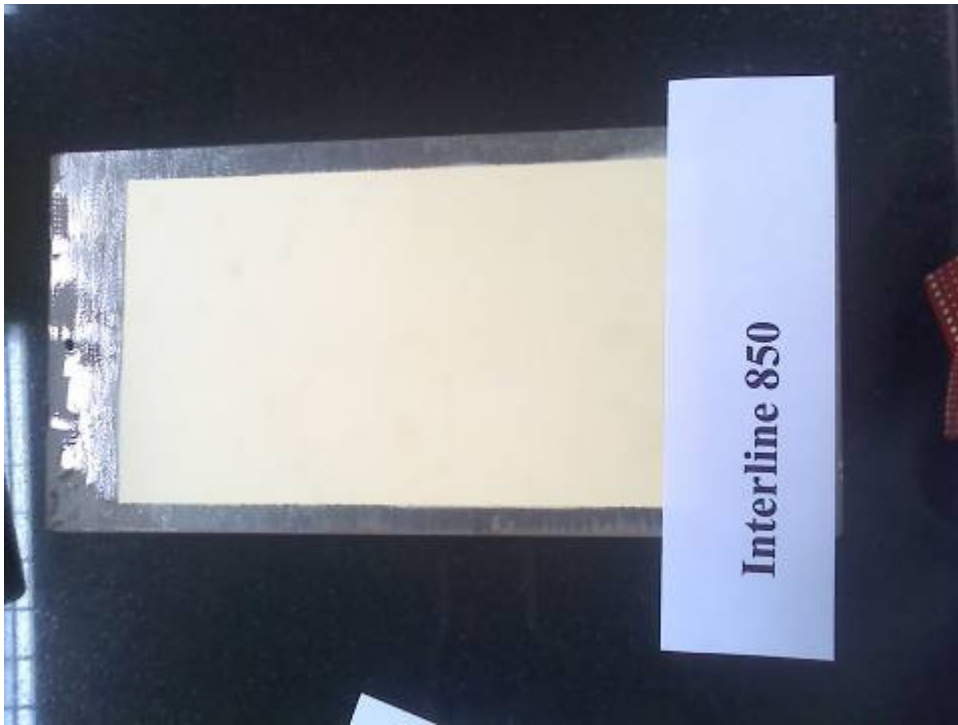
Surface Prepared for Interline 850



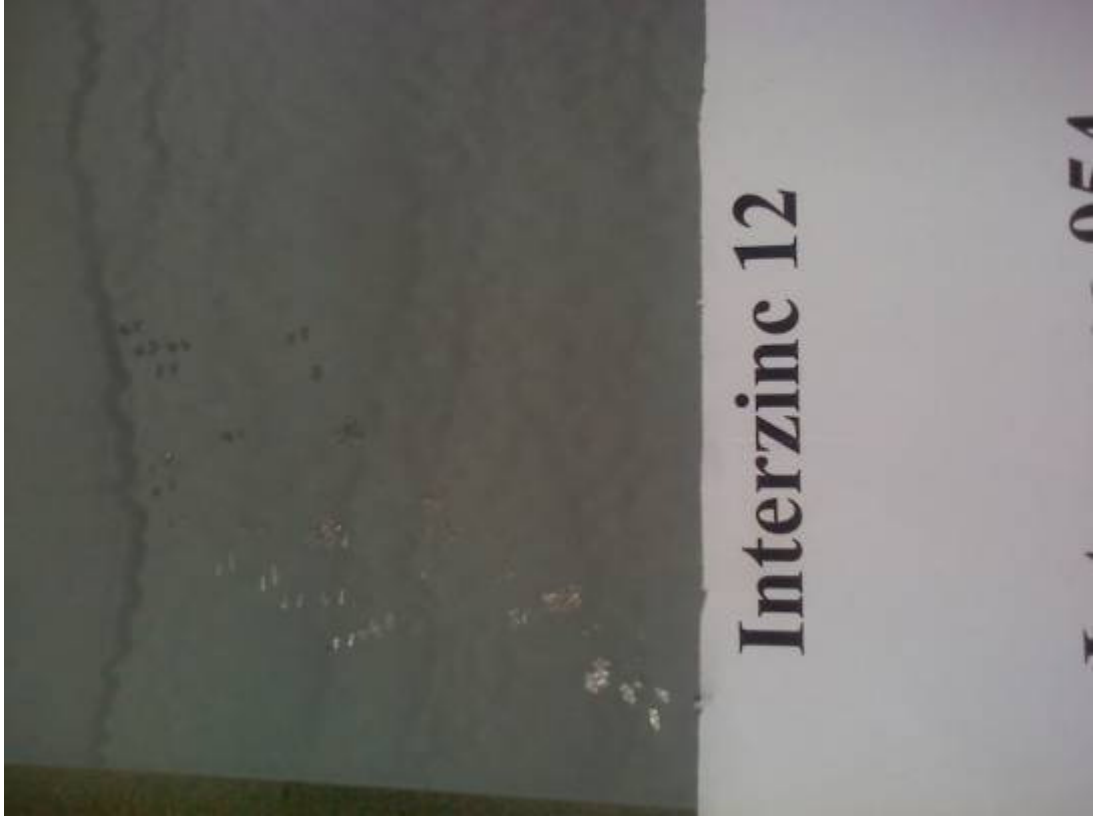
4. Application Details :

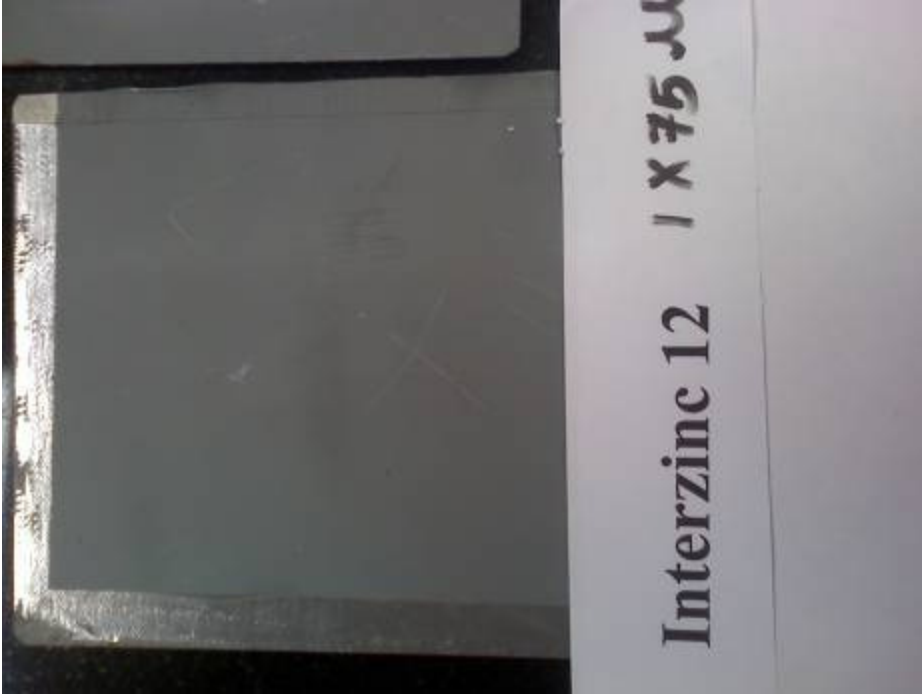
- a) Applied by conventional Air Assisted Gravity Feed Gun.
- b) Tip – 1.4 mm
- c) DFT measured as per SSPC –PA 2
- d) Interline 850 – 135 to 155 Microns
- e) Intertherm 228 - 125 – 130 Microns
- f) Interzone 954 – 500 – 560 Microns
- g) Interzinc 12 - 75 -80 Microns (Given excess coat > 200 Microns for Mud Cracks)

Various Coated Panels after Drying for 24 Hrs @ 25 +/- 3°C.



Interzone 954





Interzinc 12 after Mud Cracks

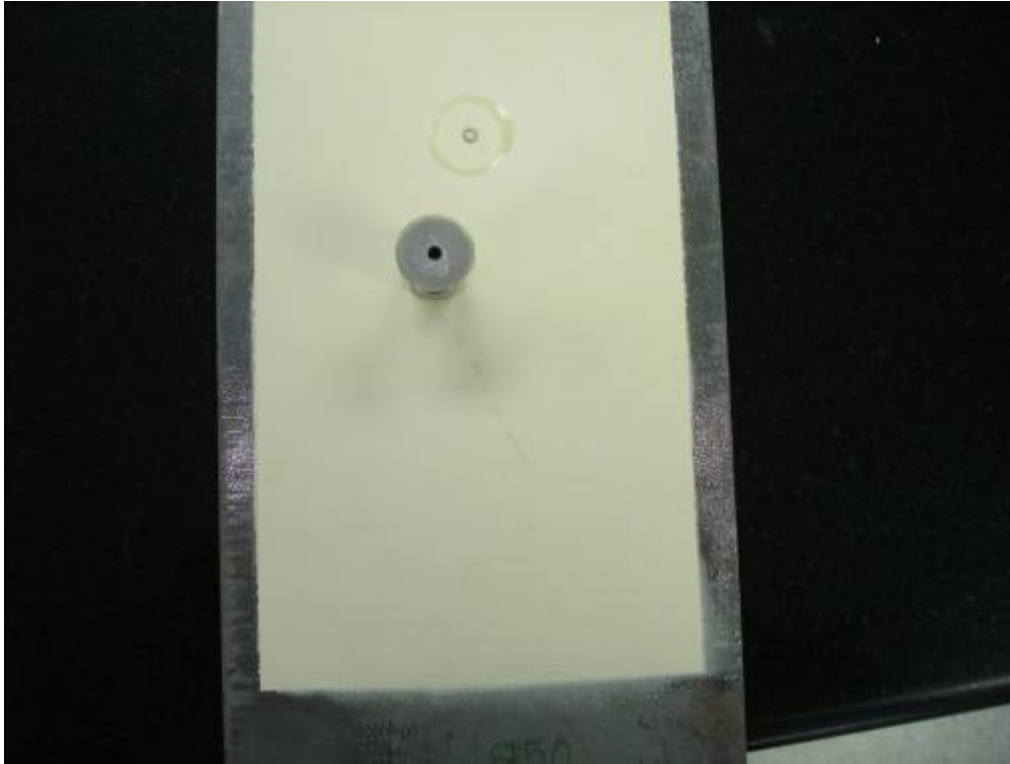




Interzone 954 after Adhesion Pull off ...



Interline 850 after 120°C 72 Hrs + Quenching + 48 Hrs @ 120°C & Quenching + 72 Hrs at Room Temperature



Intertherm 228 after 120°C 72 Hrs + Quenching + 48 Hrs @ 120°C & Quenching + 72 Hrs at Room Temperature

3) Adhesion Test: Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Tester

Standard : ASTM D4541

Substrate : 300 mm x 150 x 3mm Mild steel panel
Coated with Interline 850, Intertherm 228, Interzone 954

Instrument : Pull off adhesion tester (Hydraulic)

Instrument : Elcometer 108

Manufacturer

Model : 108

Total runs : 3

Test results

| Coating | Minimum Specification | Result | Comments |
|-----------------------------------|-----------------------|--------|----------------------|
| Interzone 954 Without Scoring | 5 MPa | 5 MPa | Glue Failure 100% |
| Interline 850 Without Scoring | 5MPa | 5 MPa | Glue Failure 100% |
| Intertherm 228 Without Scoring | 5MPa | 5 MPa | Glue Failure 100% |

Adhesion Test as per ISO 2409: Rating for adhesion test was 0 for Interline 850, Intertherm 228 & Interzinc 12

CONCLUSIONS: Application on the safe tool prepared surfaces with the coatings like Intertherm 228, Interzinc 12 & Interline 850 with intact adhesion to the surface proves that the surface prepared with Safe tool Kind Hand tool nearly good as that of fresh blasted surface. We were able to have adhesion of those coating even after giving thermal shocks, which proves that the surface cleanliness was suitable for the application of those coatings.

Interzone 954 is having surface tolerance hence was applied relatively poorly prepared surface & it has proven its ability on this type of surface.

Area where under mud cracks was as clean as it was before application for which is expert opinion need to be taken. This was experienced earlier on the Blast Cleaned Surface that whenever there are mud cracks the surface under mud cracks at least show the flash rust, Hence in this case expert opinion needed.

If we use Safe tools in maintenance situation then application of those coatings like Interzone 954, Interseal 670 HS and Interplus 256 or 356 will have grate performance for our customers.