

NEWS LETTER – 28

PAINTING TEST TECHNIQUES

Introduction:

Protective coating is done on metallic products to prevent corrosion. It includes structures, pipelines, windmills, towers, hangers and supports, etc., which are exposed to corrosive atmosphere. Application of protective coating provides a prolonged life as it delays the process of corrosion and extends the life of a product. We, Pipe Hangers and Supports have developed an exclusive Painting Test lab to monitor the process of painting right from the blasting stage to finished product.



1. Environmental Conditions measured before painting: -



- **Surface (substrate) Temperature and Dew point temperature**
Surface Temperature is the temperature of the surface to be painted as is an important factor in painting. The acceptable range of the surface temperature for coating specified by the paint manufacturer generally falls between 3 Degree C and 50 Degree C.
- **Relative humidity**
Relative humidity is a measure of the amount of moisture in air compared to saturation level (the amount it can hold at a given temperature). No blast cleaning can be done if the relative humidity is more than 85%. If the relative humidity is too high, the solvent in the coating may not evaporate. This can result in solvent entrapment and problems in the proper curing of the film.
- **Dew point temperature**
It is the temperature at which water vapour will condense, leaving water on the surface. A high dew point is an indication of high relative humidity. Dew point temperature is an important consideration when blast cleaning, because moisture condensation will cause fresh blasted steel to rust easily. Final blast cleaning and coating application should not take place

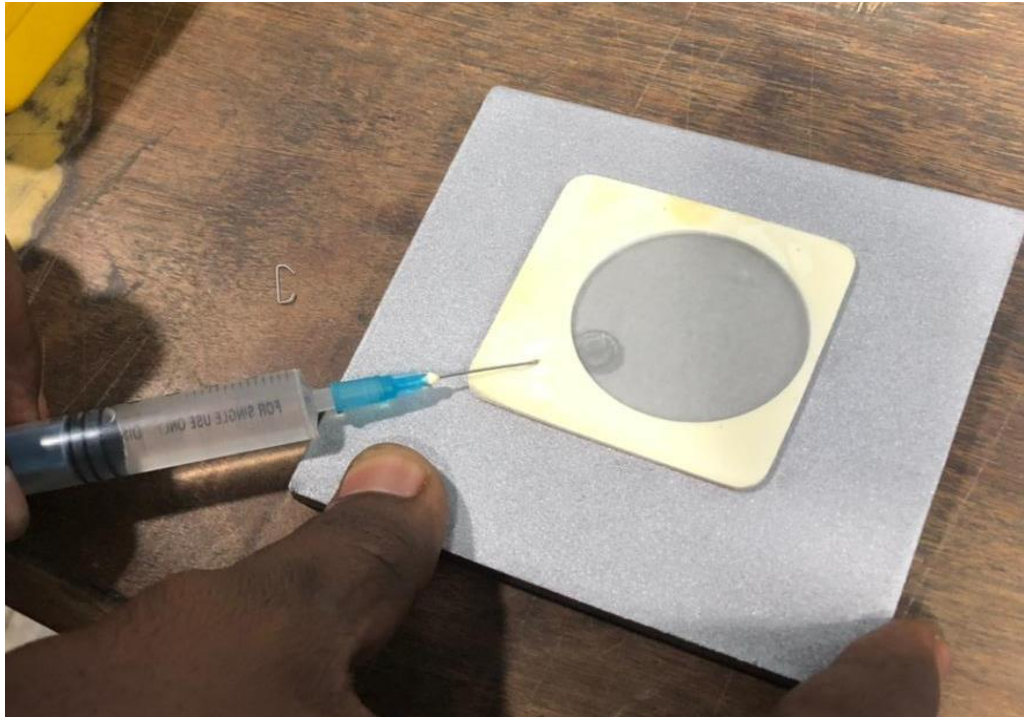
unless the surface temperature is atleast 3 Degree higher than the dew point temperature.

2. **Salt Contamination test (using Bresle patch technique):-**

The salt contamination underneath a coating can cause serious problems in future because of the hygroscopic nature of salt. Blasting or mechanical cleaning will not remove these salt molecules and often causes chloride inclusion into the substrate making it easier for corrosion.



While performing soluble salt test, water is injected in a patch that is placed on the surface. The injected water dissolves the salt present in the surface. The mixture of salts is measured eventually by a conductivity meter. Some regulations set the maximum concentration of soluble salts, measured as sodium chloride on a surface is 20mg/m² (Reference Standard : ISO 8502-6 & Surface Cleanliness : SA 2 ¹/₂).



3. Film thickness measurement

Film thickness refers to the thickness of an individual wet or dry film, and to the thickness of a paint system. Film thickness is presented in micrometers (μm).



Wet film Thickness: -

Wet film thickness can be monitored during application using a wet film thickness gauge. These gauges incorporate a series of notches cut into

their sides like a teeth of a comb. The wet film thickness value can be read directly from the comb.

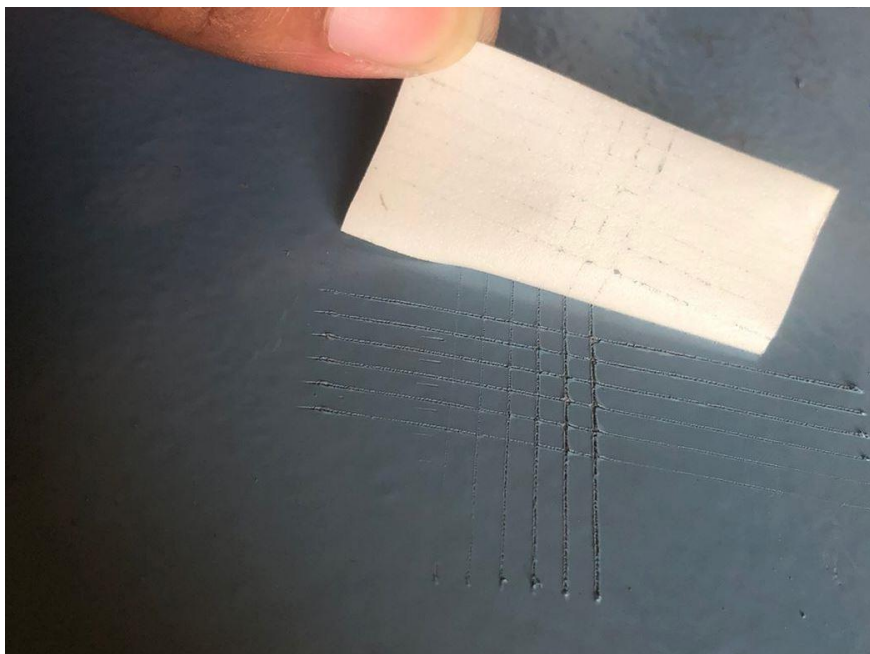
Dry film Thickness: -

Once the film is cured completely, dry film thickness will be measured. Dry film thickness shall be measured with a dry film thickness gauge. Dry film thickness is probably the most critical measurement in the coating system because of its impact on the coating process, quality and cost. Dry film thickness measurements can be used to evaluate a coating expected life, product appearance and performance and ensure compliance to correct paint system applied. DFT reading practice shall be as per SSPC-PA2.

4. Adhesion Testing Techniques: -

Cross Hatch Test

When testing a multi coat system, determination of the resistance to separation of different layers from one another can be accomplished. This test determines the resistance of paints and coatings to separation from substrates by utilizing a tool to cut right angle lattice pattern into the coating, penetrating all the way to the substrate. A quick pass/fail test can be accomplished through this method. (Reference Standard:- ASTM D3359)



Dolly Pull off Test

This method maximizes the tensile stress and is done by securing load fixtures (Dolly) perpendicular to the surface of a coating with an adhesive. The testing fixture is attached to the loading fixture and is aligned to apply tension perpendicular to the test surface. The force that is applied gradually increases and is monitored until a plug of coating detached. The minimum value required as per ASTM D4541 is 4 Mpa.



Conclusion

We at Pipe hangers are conscious of quality at all stages, including Painting.

You can TRUST us, of course it costs a little more, and it is worth it !

For past newsletters please look up our website www.pipehangers.in

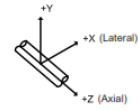
About Pipe Hangers:

A Global Solution to Spring Hangers and Supports

We are the leading manufacturer of spring hangers, supports & accessories. Over the past 35 years we have supplied to major power plants, refineries, nuclear installations & process industries in India & several International projects.

Pipe Hangers & Supports Private Limited

Ordering Information



- 1) Hot Load (Operating Load) in Kgs : _____
- 2) Thermal Movement / Travel (Direction + or -) in mm : UP (+) _____ mm
- 3) Type of Hanger Variable / Constant / Rigid : Variable Effort Support
- 4) For Constant Add Over Travel : Yes No
- 5) For Variable Springs Max Allowable % Load Variation : _____ %
- 6) Horizontal / Lateral Movement (If any) : 'X' Dir _____ mm / 'Z' Dir _____ mm
- 7) Hydro Load (If any) : _____ Kgs
- 8) Model & Type of Support : _____
- 9) Assembly Length (From BOS/TOS to Pipe CL) : _____ mm
- 10) Operating Temperature : _____ Deg C
- 11) Pipe Insulation Thk : _____ mm
- 12) Pipe Material : _____
- 13) Require Pipe Shoe for Foot Mounted Support : Yes No
- 14) For Foot Mounted Support Match Height : Yes No
- 15) Attachments like Lugs, Cleats Welded to Pipe in Scope : Yes No
- 16) Operating Load includes Wt of Accessories like Clamp, Tie Rods, Cleats, Lugs etc. : Yes No
- 17) Preferred Surface Protection / Painting : _____
- 18) For 'G' Type / Double / Trapeze type Hanger the Load Given above is for 1 assembly consisting of 2 Hangers / Individual Hanger : Yes No

