How does Moisture Play Havoc during Surface Preparation and Coating?

- High atmospheric humidity enhances condensation of moisture on the surface.
- Condensation result in flash-rust causing the coating to fail.
- Surface-condensation: if painted over, may result in blistering and de-lamination
- 60% to 80% of all premature coating failures are caused either completely or partially by inadequate or improper surface preparation.
- Adhesion of the film with surface is the key to coating effectiveness. Proper surface preparation enhances adhesion of film with surface.
- Common surface preparation defects flash-rust: prevents the coating from adhering properly to the substrate.

Most of the failures of coating are a result of poor or inadequate surface preparation. The objective of surface preparation is to create proper adhesion of coat over the substrate.

Any surface after it is blasted and prepared for coating is subjected to environmental factor, until the first coat is applied. Presence of high humidity condition causes the formation of rust bloom on the mental surface, coating over which would lead to blistering and de-lamination.

The term **"Hold the Blast"** is commonly used and referred to the prevention of rust bloom from forming between the blasting and coating cycles. Proper environmental controls with Dehumidifiers help in 'holding the blast' during the blast coat cycles.

The life of the coating cannot be guaranteed on large, cool metal surfaces like ship interiors, petroleum and chemical storage tanks etc. unless the surface is clean and dry when the coating is applied. This is because blasting and coating operations on metal surfaces encounter several problems, when RH is high or surface temperatures are low.

High humidity in the environment condenses on the colder surface in the form of droplets, causing the metal surfaces to rust immediately after being blasted. As a consequence, the coating does not adhere properly and coating process has to be repeated. Besides this, condensation also causes blistering, blooming, peeling problems in paint jobs.

The rate of condensation and corrosion in a specific environment increases when the relative humidity of the area is 45% or above. Control the Humidity below 45% to prevent corrosion.

Recommended Environmental Controls for Quality Coating:

- Maintain a 3°C differential between the air dew point and surface temperature of the steel surface to be coated, with the surface temperature being high.
- Maintain a 10°C Dew point differential between the air inside and the air out side of the tank.
- Maintain relative humidity of the surrounding air below 40%

All Major specifications call for above conditions including:
EIL : "Standard specs for shop & field painting"
NACE : "6A 192"
SSPC : "SP 10"
BS : "BS 4232"
SS : "SIS-055900-1967/ISO-8591-1-1988

JOINT REPORT BY NACE & SSPC : SSPC- TR 3/NACE 6A 192 : Offer strategies for realizing the benefits though selection, design, installation and operation of suitable RH and temperature control equipment for coating and linings of steel tanks, vessels and other enclosed spaces.

How to 'Hold the Blast'…..

Dehumidification is the simplest and most cost effective solution to ensure proper surface preparation and coating.

"Hold the Blast" refers to the preventing flashing or immediate corrosion after blasting the metal surface, commonly referred to as maintaining the 'white metallic luster'

Dehumidification removes the moisture from the coating system. Dehumidifying the air inside the tank while blasting and coating helps to achieve and maintain the level of moisture to prevent condensation and thus, rust bloom.

An adequately designed Dehumidification system during blasting and coating operations ensure that:

- The air relative humidity inside the tank is maintained at the level as specified by the coating manufacturer, for optimum performance of the coating enabling timely completion.
- The air dew point is maintained at least 5°F (3°C) below the surface temperature to prevent condensation and flash – rust, the common reason for premature coating failures. All specifications including NACE, SSPC, EIL etc. call for the same.
- Prevents any condensation between coats there by reducing the possibility of inter coat de lamination and improving curing properties.
- Prevent builds up of hazardous and inflammable vapors inside enclosed areas being blasted and provide ventilation air for site personnel.
- Assured quality coating, adhering to paint manufacturers specification
- The life of the coat is increased by 1.5 times-2 times
- Inter-coat adhesion is appreciably improved
- Coating is possible at any time of the year
- Down time can be accurately programmed
- Project time and cost is reduced by 35%

The Beneficiaries of Dehumidification's

- The Owner
- The Contractor
- The Coating Manufacturer
- The Coating Inspector

Benefits of Dehumidification

- For the owner:

- Less coat per year for maintenance
- Better coating performance
- No problems like rust-bloom & blistering
- Project time and cost reduced by 35%.
- Coating possible at any time of the year.
- Accurately program the downtime

- For Contractor:

- Can blast the total surface then coat
- No duplication of surface cleanings
- No downtime for bad weather
- No adhesion problems
- Increased productivity
- Better performance
- Fewer warranty issues
- No battles with

- Paint manufacturer

- Coating inspector

For Coating Manufacturer

- Better performance of coating
- Fewer warranty issues
- No battles with contractor

For Coating Inspector

- Meet manufacturer's specification for applications

OTHER BENEFITS OF DEHUMIDIFICATION

- Almost all linings are flammable during application, especially the solvents. Proper control of the air can ensure safe environmental conditions.
- Humidity control is essential to gain maximum effectiveness with certain types of linings
- Provides ventilation air for personal that perform cleaning and coating.
- Prevents the build up of hazardous vapors and particles inside the tank.

The Airblast Solution

Airblast Desiccant or Air cooled Dehumidifiers “holds the blast” by providing dry air at a lower dewpoint and thus ensuring a cleaned surface free from condensation, indefinitely.

Airblast Dehumidifiers makes it possible to schedule the coating operations economically and in all seasons.
Thus, the Airblast desiccant dehumidifier is ideal for the contractors as well as the end users, enabling them to blast and coat regardless of the weather.