Introduction to Corrosion Control and Coatings

Coating Application and Safety

Topics

- Product data sheet contents
- Proper mixing and application procedures
- Induction period and pot life
- Touch-Up
- Safety
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Stages of Coating Application

Coating Application - Video
Product Data Sheets

- Coating Manufacturer's Product Data Sheet (PDS)
  - An “instruction manual” for the coating
  - Technical information about the coating
  - No standardized content

- The engineer must be familiar with the requirements listed on the PDS

Ambient Conditions and Surface Temperature

- Surface temperature must be at least 5°F higher than the dew point temperature
  - Keeps moisture from condensing on the surface

- Verify conditions are all within the coating manufacturers’ specified ranges and/or as required by the technical manual

- Coating failure may occur if ambient conditions are not within specified ranges
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Mixing

- Prior to mixing, verify materials are within manufacturer's shelf life
- Check PDS for mixing instructions
- Multi-component coatings
  - Engineer must determine whether partial kit mixing is permitted

Mixing

- Mixing single component materials
  - Ensure the material is homogeneous by mixing all of the settled pigments and solid materials into the liquid
Induction Period

- Also known as sweat-in, stand-in, cook time, or digestion
- Required for some coatings
- Period of time when components chemically co-react
- Part of the pot life (but not the usable pot life)
- Generally, the warmer the material, the shorter the required induction time

Usable Pot Life

- The period of time (after mixing) that multiple component coatings are usable
- Ranges from a few minutes to 24 hours
- Once pot life has expired, any remaining coating should not be used
Coating Application

- Method used depends upon:
  - Size and configuration of surface to be coated
  - Desired or required transfer efficiency
  - Type of coating
  - Environmental regulations
  - Proximity to other operations/conditions
  - Technical manual and coating manufacturer’s recommendations

Brush/Roller Application

- Most commonly used for stripe coating and field touchup
- Provides extra corrosion protection on edges, outside corners, crevices, bolt heads, etc.
Spray Application

- Popular methods of spray application
  - Airless spray
  - Conventional spray
  - High volume low pressure (HVLP) spray

Touch-Up Pen

- Designed for touch-up of small areas where spraying may be impractical or not allowed
- Convenient storage, mixing, and application of pre-measured two component materials
- Primers and topcoats are available
Aerosol Touch-Up

- Simple method of applying approved coatings for small, touch-up processes
  - Unapproved aerosol coatings shall NOT be used
- Minimize hazardous waste disposal and equipment cleanup
- Primers and topcoats are available

Safety
Safety Data Sheets

- Provide safety-related information for materials and their ingredients
- Inform workers about the health hazards of a material's components and provide safeguards for handling
- Provide instructions on proper actions to take in the event of an emergency

Hazardous Materials

- Cleaning solvents
- Abrasives and dusts
- Toxic metals (e.g. hexavalent chromium)
- Coating components
- Thinners
- Chemical strippers
- Acidic and caustic solutions
- Asbestos
Hazardous Coating Compounds

- Pigments
  - Most heavy metals are toxic
  - Some metals are carcinogenic
  - Even zinc can be toxic in high doses

- Binders (resins)
  - Isocyanates in polyurethane coatings
  - Skin and respiratory tract irritants
  - Wear proper PPE (based on SDS)

- Acids
  - Conversion coatings

Hazardous Environments

- Heights
- Confined spaces
- Electrical hazards
- Energized equipment
- Fire and explosion hazards
- Heat/steam
- Other hazardous environments
Personal Protective Equipment (PPE)

- A “must” for safety
- Coatings maintainer should wear suitable safety equipment and clothing
  - Respirator
  - Eye protection
  - Hearing protection
  - Protective clothing and equipment

Coating Application and Safety Summary

- Product data sheets are the governing instructions when applying coatings.
- Coatings must be properly mixed and applied to prevent coating failure.
- Cleaning, surface preparation, and coatings application can be hazardous.
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Agenda

• Corrosion Basics
• Fundamentals of Corrosion Control
• Surface Preparation for Coatings
• Coatings and Coating Types
• Coating Application and Safety
• Coating Defects and Inspection