Substrate Preparation & Primers

Roger V. Morrison, PE, RRC
Deer Ridge Consulting, Inc.
Disclaimer:

Opinions expressed in this presentation are those of the presenter and may not be consistent with SPFA technical documents or manufacturer specifications and recommendations.
Elements of an SPF Roof

Like links in a chain:
Everything must be securely connected together
Problems: Wind Damage
Problems: Blisters
Problems: Delamination
Problems: Cracking
Problems: Distortion
Problem Summary

- Wind Damage
- Blisters
- Delamination
- Pulled Details
- Cracking
- Distortion
- Others?
Surface Moisture

GOOD KNIT LINE

BAD KNIT LINE
Tip # 1: MDP Strips

• Check surface moisture with Moisture Detection Paper Strips (MDP)
  – NCFI MDP Strips
Tip # 1: MDP Strips
GUIDELINE FOR ROOF ASSEMBLY EVALUATION FOR SPRAY POLYURETHANE FOAM (SPF) ROOF SYSTEM

Spray Polyurethane Foam Alliance
4400 Fair Lakes Court, Suite 105
Fairfax, VA 22033

To order copies of this publication, call 800-523-6154 and request Stock Number AY 138.
AY 138 Highlights (1)

- General Considerations
  - Roof Deck / Assembly Security
  - Building Codes
  - Moisture
  - Substrates: acceptable or not
AY 138 Highlights (2)

• Recover Criteria
  – Surface
    • Dry
    • Free of loose gravel, dirt, debris
    • Free of contaminants
  – Substrate
    • Secured
    • Water saturation
    • Building Codes: Number of roofs, uplift resistance, other
  – Structural Components
AY 138 Highlights (3)

- **Reroof with Tear-off Criteria**
  - Deck
    - Dry
    - Free of loose gravel, dirt, debris
    - Free of contaminants
  - Deck is acceptable substrate
  - Deck and Structural Components meet building code, insurance, other design requirements
AY 138 Highlights (4)

• Roof Evaluations
  – Preliminary
    • Roof history, wind loads, occupancy, insulation requirements, etc.
  – Inspections
    • Building exterior & interior
    • Roof Surface
    • Roof Assembly: test cuts / cores
    • Moisture survey
  – Deck and wind uplift evaluation
Tip # 2: Coal Tar (1)

• Look for coal tar in existing roof substrates
  – Problem 1: Incompatible with asphalt
    • Look for weak bonds in core samples
  – Problem 2: Low softening temperature
    • Look for coal tar surfacing in existing BURs
Tip # 2: Coal Tar (2)

- Use mineral spirits to identify coal tar
  - Mix a piece of BUR surfacing in mineral spirits
  - Coal Tar: solution remains clear (may be light yellow, amber or green color)
  - Asphalt: solution will turn black
Tip # 2: Coal Tar (3)

• When applying SPF to coal tar roof surface:
  – Too much heat will soften coal tar and cause delamination / blisters
  – Keep first SPF pass thin (< ¾ inch)

• When asphalt / coal tar identified between core sample layers:
  – Tear-off or refasten existing BUR
Tip # 3: Mechanically Fastened SPF

- For small areas of questionable substrate security or SPF adhesion:
  - Spray ½ - ¾ inch layer of SPF
  - Mechanically fasten that SPF layer, using it like a recover board
  - Spray subsequent SPF passes to specified thickness
Primers

• Follow the recommendations of the manufacturer of your:
  – Spray polyurethane foam
  – Coating
  – Primer
Primers: Why, When and How to Use Them
In spray polyurethane and/or elastomeric coating systems

Spray Polyurethane Foam Alliance
4400 Fair Lakes Court
Suite 105
Fairfax, Virginia 22033
Copyright 2004

To order copies of this publication call 800-523-6154 and request Stock number AY 143
AY 143 Highlights (1)

• Why use primers?
  - Enhance adhesion between
    • Substrate and SPF or coating
    • SPF layers
    • Aged SPF and coating
  - Seal porous substrates (moisture)
  - Darken substrates
    • Improve SPF yield
    • Reduce surface moisture
  - Inhibit corrosion
• Where and when to use primers
  – Depends on:
    • Substrate
      – New or existing roof surfaces
      – New or old metal
      – New or old SPF
      – New or old coating
      – Porous or non-porous
    • Applied material
      – SPF
      – Coating
AY 143 Highlights (3)

- What types of primers?
  - Water-based (acrylic)
  - Epoxy (two-component)
  - Rust inhibiting
  - Others
AY 143 Highlights (4)

• Cautions
  – Always consult with your manufacturers
  – Primers can be tricky
    • Too much or too little may cause problems
  – Porous surfaces (wood, masonry, SPF)
    • Primers help seal surfaces to eliminate surface moisture and entrapped air
Tip # 4: Contact Adhesives

• For non-porous surfaces:
  – Apply a contact adhesive and allow to cure before SPF application
  – Techno Adhesives #199 & #441
    • Cincinnati, OH
    • 800-432-0107
    • www.technoadhesives.com
  – Aluminum, stainless, plastics, etc.
Tip # 5: Old & New SPF (1)

• OPINION
  – SPF goes through a multi-step, UV aging process
    • Hard, glassy surface (within a few days)
    • Friable, dusty surface (week or more)
  – Best way to handle either condition is to:
    • GRIND and PRIME
Tip # 5: Old & New SPF (2)

- Removing surface layer eliminates questionable SPF
- Scarifying may leave rough, uneven surface subject to air entrapment
- Grinding leaves a more even surface for primer application
Tip # 5: Old & New SPF (3)

- Main effect of priming SPF that has been ground smooth:
  - Fills and seals the open cell surface
  - Provides better contact surface for next SPF pass
- Even acrylic elastomeric roof coating can be used as primer
- Caution: Your manufacturers’ recommendation may vary
Summary (1)

• Chain of connection must be secure
• Substrate security problems may result in:
  – Wind damage
  – Blisters
  – Delamination
  – Pulled details
  – Cracking
  – Distortion
Summary (2)

• Careful and thorough evaluation of roof / substrate critical for success
  – Review AY 138

• Substrate security is just as important as SPF adhesion

• Primers are useful for:
  – Enhanced adhesion
  – Corrosion protection
  – Improved SPF yield
  – Review AY 143
Summary (3)

• Always consult your manufacturers for specific recommendations
Questions?