Tnemec Liquid-Applied Air Barrier System Specification

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Section Includes:
   1. Spray-applied insulative coating including primer, insulative coating and topcoat. Applied to steel penetrating the exterior envelope, as indicated on the Drawings, at a minimum 18” inboard and 18” outboard of the exterior envelope, including canopies, terraces and roof penetrations for dunnage and davits and similar items.
   2. Aerogel filled thermal break tape including primer coating at locations where spray or roller applied coating is not practical (Contractor's option).

B. Sustainable Design Intent: Comply with project requirements intended to achieve sustainable design, measured and documented according to the LEED Green Building Rating System, of the US Green Building Council. Refer to Section 018110, SUSTAINABLE DESIGN REQUIREMENTS for certification level and certification requirements.

C. Related Work: The following items are not included in this Section and are specified under the designated Sections:
   1. Section 051200 - STRUCTURAL STEEL FRAMING for steel substrates.
   2. Section 055000 - MISCELLANEOUS METALS for steel substrates.
   3. Section 099000 - PAINTING AND COATING.

1.3 SUBMITTALS

A. Product Data: Submit product data including manufacturers technical data indicating product performance characteristics, performance and limitation criteria.

B. Manufacturer’s Instructions: Submit manufacturer written installation instructions.

C. Applicator Qualifications: Submit applicators current certification as a manufacturer trained applicator.

D. Performance Documentation: Submit published design listings for insulation value ratings and product thickness. Include evidence that the Liquid thermal break testing was sponsored by the manufacturer and that the material tested was produced at the manufacturers facility under the supervision of technical personnel.

1.4 QUALITY ASSURANCE

A. Manufacturer:
   1. Company specializing in manufacturing product in this section with a minimum of 2 years documented experience in manufacturing insulative technology.
   2. Applicator: Company specializing in applying the work of this section with documented experience and certified / trained by the manufacturer.
   3. Liquid applied thermal break acrylic system shall be the complete system from a sole source consisting of primer, acrylic thermal break material and topcoat. For materials, inboard of the exterior envelope, materials shall be LEED compliant.

B. Mock-up:
   1. Minimum thirty days prior to application in any area, provide mock-up samples of thermal break materials in accordance with the following requirements:
      a. Provide minimum 2 sq. ft. on representative substrate, where directed by the Engineer, for each different desired R Values and finish of required for the work.
      b. Provide mock-up areas that comply with thickness, density application, finish texture, and color.
      c. Inspect mock-up areas within one hour of application for variance due to shrinkage, temperature, and humidity. Where shrinkage and cracking are evident, adjust mixture method of applications as necessary to meet required installation, R Valve, finish and color requirements.
      d. Continue to provide mock-up areas until acceptable areas are produced.
      e. Acceptable areas shall constitute standard of acceptance for method of application, thickness, finish texture, and color requirements, for Liquid applied thermal break material applications.

1.5 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials in manufacturers' original, sealed, undamaged container with identification label intact. Packaged materials shall bear the appropriate labels, seals.
B. Storage: Materials shall be stored in strict accordance with manufacturers documented instructions.
C. Documentation: All batch number, product identification and quantities shall be recorded on appropriate QC documents. A copy of the transport document and manufacturers conformance certificate shall be attached to the material delivery on site.

1.6 PROJECT/SITE CONDITIONS

A. Project Environmental Requirements: Substrate and air temperature shall be in accordance with the manufacturers' requirements including the following:
   1. Protect work area from windblown dust and rain. Protect adjacent areas from over spray of material.
   2. Provide ventilation in areas to receive work of this section during application and minimum 24 hrs. after application.
B. Temperature and Humidity Requirements: Maintain air temperature and relative humidity in areas where products will be applied for a time period before during and after application as recommended by manufacturer.
   1. Do not apply coatings when temperature of substrate and/or surrounding ambient air temperature is below 45°F. Temporary protection and heat shall be maintained at this minimum temperature for 24 hrs. before, during and 24 hrs. after material application.
   2. Steel substrate temperature shall be a minimum of 5°F (3°C) above the dew point of the surrounding air for a period of 24 hrs. prior and during the application of the material.
   3. If necessary for job schedule, the General Contractor shall provide enclosures and heat to maintain proper temperatures and humidity levels in the application areas.
   4. The relative humidity of the application area shall not exceed a maximum of 75%, 24 hrs. prior, during and 24 hrs. after the application of the material. The relative humidity shall not exceed 75% throughout the application and drying of the decorative top coat finish.

1.7 WARRANTY

A. Manufacturer's Warranty: Provide manufacturer's standard warranty.

PART 2 - PRODUCTS

2.1 LIQUID-APPLIED INSULATIVE COATING

A. Basis-of-Design: Tnemec Series 971 & Series 961 (Special Order) Aerolon Coating System by Tnemec, Kansas City, MO, as represented by Righter Group, ww.rightergroup.com, Tel. 800-533-3003.

1. Steel: Surface Preparation and Primer for Coating Steel, Shop or Site Applied:
   a. Preparation: Abrasive blast clean, SSPC SP-6 for exposed steel or SSPC SP3 for enclosed steel, surface profile 2-3 mils. Remove weld splatter and grind defects smooth. Steel substrate temperature shall be a minimum of 5°F above the dew point of the surrounding air for a period of 24 hrs. prior and during the application of the material.
   b. Primer: Tnemec Series 1224T or 394 or 530V, with less than 11 grams VOC, surface tolerant inorganic epoxy coating, at 6-8 mils DFT.
2. Galvanized Steel: Surface Preparation and Primer for Coating Steel, Shop or Site Applied:
   a. Preparation: SSPC SP16.
   b. Primer: Tnemec 135 Chembuild at 5-7 mils DFT.
3. Concrete: Surface Preparation and Primer for Coating Concrete, Site Applied:
   a. Preparation: Grind all surfaces smooth.
   b. Primer: Tnemec Series 1224T with less than 11 grams VOC, surface tolerant inorganic epoxy coating, at 6-8 mils.
4. Aluminum: Surface Preparation and Primer for Coating Aluminum, Site Applied:
   a. Preparation: Clean surface of foreign material, grind defects smooth.
   b. Primer: Tnemec Series 1224T with less than 11 grams VOC, surface tolerant inorganic epoxy coating, at 6-8 mils.
5. Insulative Coating: Coating Tnemec Series 971 & Series 961 (Special Order) (for AESS Steel) Aerolon liquid-applied thermal break coating.
   a. Solids by Volume: 76%.
   b. Coating Type: Water based thermal acrylic, spray applied.
   c. Minimum Film Thickness: As required to achieve specified R Value.
   d. Fire Performance: ASTM E 84, Class A.
   e. VOC Content: 0.01 lbs./Gallon (1.0 grams /liter).
   f. Thinned: 0.01 lbs./ gallon (1.0 grams /liter).
   g. HAPS: 0 lbs. per gallon solids.
   h. Curing Time: 75°F, 4 hers to touch 16 hrs. to recoat.
   i. Thermal Transmission: ASTM C 518, no more than 50 mW/ mK.
   j. Net Weight per Gallon: 4.66 lbs. per gallon
   k. Storage Temperature: 40°-110° F.
   l. Number of Components: One component part powder not liquid
   m. Prohesion: ASTM D 5894, 4,00 hrs.
   n. Salt Fog: ASTM B 117m 4,000 hrs.
   o. Immersion: ASTM D 870 – 4,000 hrs.
   p. Humidity: ASTM D 4585 – 4,000 hrs.
   q. Water Immersion: ASTM D 870 Method B, 2,000 hrs. at 140°.
   r. Taber Abrasion Resistance: ASTM D 4060 (CS-17 Wheel, 1,000g load), no more than 50 mg loss after 1,000 cycles.
   s. Required Thermal Resistance, W Sections, 60 mils (approx. 1/16 inch): 0.25 R-value for Series 971 (180mils for 961, Special Order)
   t. Required Thermal Resistance, HSS Sections, 120 mils (approx 1/18 inch): 0.50 R-value for 971 (180 mils for 961, Special Order)

6. Topcoat: Tnemec Series 1028 Enduratone at 2-3 mils DFT for non-immersion services. Apply Tnemec Series 22 at 16-40 miles DFT depending on application for areas where immersion is required.
    a. Color for Exposed Applications: As selected by Architect.

2.2 AEROGEL FILLED THERMAL BREAK TAPE

A. Basis-of-Design: Tnemec Series 945 Peel & Stick Aerolon by Tnemec, Kansas City, as represented by Righter Group, ww.rightergroup.com, Tel. 800-533-3003.
    1. Primer Coating for Steel or Concrete to Receive Thermal Break Tape: Tnemec Series 90-97, 394, 530V (Concrete) or 1224 VOC, surface tolerant inorganic epoxy conforming to the following requirements. Galvanized metal must be clean dry and abraded.
        a. Bond Strength: ASTM D4541 1320 psi
        b. Abrasion Resistance: ASTM 4060 181 mg
        c. Cathodic Disbondment: ASTM D G8- No disbondment 3000 Hrs.
        d. Water Vapor Transmission: ASTM D 1653 4.68 g/m2 /24hrs/<0.22 prms.
    2. Tnemec Series 945 Aerogel Filled thermal break tape, conforming to the following requirements: Material may be shop or field applied.
        a. Thermal Transmission: Must meet ASTM C 518 - No more than 49.8mW/ mK.
        b. Net Weight per Gallon: 4.66 lbs. per gallon.
        c. Storage Temperature 40°F Maximum 110°F
        d. Number of Components: one component.
        e. Primer Required: As recommended by manufacturer.
        f. Topcoat Required: Refer to Section 2.0 and 3.0.
    3. Thermal Resistance of Thermal Break Tape: Thermal Conductivity (ASTM C518 at 77°F): 49.7 W/m-°K or 0.3446 BTU-in/ft²-hr-°F (R value at one-inch equals 2.9) Tnemec 945 is to be applied in 60 mil (1.5mm) lifts to desired R value established by Architect. Performance Data:
        a. ASTM E 84 – Class A.
        b. ASTM D 5894 – 4,000 hrs Prohesion.
        c. ASTM B 117 – 4,000 hrs Salt Fog.
        d. ASTM D 870 – 4,000 hrs. Immersion.
        e. ASTM D 4585 – 4,000 hrs. Humidity.
        f. 18 Months Roof Exposure.
        g. Compatible with DOW 790 Sealant.
    4. Application Thickness:
        a. W Sections: One 60 mil layer, DFT.
        b. HSS Sections: Two 60 mil layer, DFT.
        c. Concrete: Minimum two 60 mil layers, DFT; confirm with manufacturer based on site conditions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Application shall not commence until the Contractor, Installer and Architect/Engineer have examined the surfaces to receive the primer and determined the surfaces are acceptable to receive the coatings. Commencement of application means acceptance of substrate.
B. Verify that substrate and workspace temperature and humidity conditions are in accordance with manufacturers recommendations.

3.2 PREPARATION

A. Provide masking, drop cloths or other suitable coverings to prevent overspray onto surfaces not intended to be coated.
B. Clean, dry and free of oil, grease, loose mill scale, dirt, dust or other foreign substances which would impair bond of the material to the substrate.
C. Primer shall not be applied to prepared substrate until the area has been adequately vented to remove all airborne dust. Prior to the application of any coating material, the blast products, dust and debris, shall be removed by vacuuming.

3.3 APPLICATION OF INSULATIVE COATING

A. Equipment and application procedures shall conform to the manufacturer's application instructions. Materials shall be applied at the required dry film thickness per the appropriate thicknesses specified.
B. Apply primer at thickness recommended by manufacturer. Apply insulative coating 60 mils DFT for W Shapes, 120 mils DFT, for HSS sections, 60 mils DFT per lift. Final DFT is measured with a dry film thickness gauge. Apply topcoat at thickness recommended by the manufacturer.
C. Do not apply coatings to steel deck unless otherwise indicated.

Note: Representatives consult Tnemec if Tnemec Series 961 (Special Order) is required for specific thickness.

3.4 APPLICATION OF THERMAL BREAK TAPE

A. Equipment and application procedures shall conform to the manufacturer's application instructions. When the use of Tnemec Series 971 or Series 961(Special Order) Aerolon Acrylic is used in concert with Tnemec 945, apply 945 First and spray Series 971 or 961 onto the Aerolon 945 Tape.
B. Apply Tnemec Series 945 Aerolon, Aerogel Filled Thermal Break Tape at thicknesses / layer noted above. Subsequent layers may be applied immediately after each other, using heat gun to activate adhesive more quickly as required in low temperature applications until final DFT is achieved for required. Work bubbles out of film with wallpaper or other rollers making 945 intimately bonded to substrate with no air gaps.

3.5 FIELD QUALITY CONTROL

A. The Owner will engage an independent testing laboratory inspect and verify the application of material in accordance with the provisions Tnemec Company.
    1. Material inspection and testing shall be performed 24 hrs. after completion of final application coat.
    2. The results of the above tests shall be made available to all parties at the completion of each pre-designated area and approval.
    3. In-place material not in compliance with desired R Values the specification requirements shall be corrected prior to final acceptance.
B. The dry film thickness (DFT) of the applied material shall be measured with a nondestructive coating thickness gage after material has completely cured. All measurements shall be documented in writing and furnished to the Owner.

3.6 CLEAN UP AND REPAIR

A. Upon completion of installation, excess material, overspray and debris shall be cleared and removed from the job site. Remove overspray materials from surfaces not required to be thermally protected.
B. Patching and repair to material, due to damage by other trades, shall be performed under this Section and paid for by the trade responsible for the damage. Patching shall be performed by applicators certified by the manufacturer and applied in accordance with the manufacturer application instructions.

END OF SECTION

Specifier Notes: This product selection guide is written according to the Construction Specifications Institute (CSI) Format, including *Master Format*, *Section Format*, and *Page Format*, contained in the CSI *Manual of Practice.*

The section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the drawings.

Delete all "Specifier Notes" when editing this section.

Specifier Notes: This section covers Tnemec high-performance coating systems for commercial facilities.

This specification is only a guide listing various coating system options for various environments and should not be used as a final specification. Additional coating systems not listed in this specification are available and may be more appropriate for your coating application. To finalize this specification, please contact www.rightergroup.com

Many coatings contain organic solvents. Consult Righter Group for compliance to local VOC regulations.

Righter Group, Incorporated
187 Ballardvale Street, Suite A190
Wilmington, MA 01887
Phone: (800) 533-3003 Fax: (800) 988-9824

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