Tnemec 945 Aerolon Thermal Tape Specification

PART 1 – GENERAL

1.01 DESCRIPTION

A. This specification covers labor, materials, equipment, and application necessary for, and incidental to, the complete and proper installation of Tnemec Series 945 Aerolon Thermal Tape for application to steel, concrete, wood, aluminum structures and supports in accordance with all applicable requirements for condensation control.
B. For location and members requiring Thermal Tape.
C. This specification shall be supplemented by the applicable requirements of building codes, insurance rating organizations and all other authorities having jurisdiction.

1.02 SECTION INCLUDES

A. Corrosion protection primer material.
B. Fluid Applied Thermal Break
C. Thermal Break Tape
D. Topcoat for Thermal Tape
E. Condensation Control

1.03 RELATED SECTIONS

A. Section 05 5100 Structural Steel
B. Section 05 05500 Miscellaneous Metals
C. Section 04 0440 Piping and HVAC Systems

1.04 REFERENCES

A. American Institute of Steel Construction (AISC)
   1. AISC 303-05 Section 10 – Erection and storage of coated material during shipment and site handling shall be protected to minimize field touch up.
B. American Society of Testing and Materials (ASTM)
   1. ASTM D903 - Standard Test Method for Peel Strength
   2. ASTM C177 - Standard Test Method for Thermal Conductivity
   3. ASTM E96 - Standard Test Method for Water Vapor Permeance
   4. ASTM D4585- Standard Test Method for Humidity Resistance
   5. ASTM E84 - Standard Test Method for Surface Burning Characteristics
C. Association of the American Walls and Ceilings Industries (AWCI)
D. The Society of Protective Coatings (SSPC)
   1. SSPC SP-6, SP-2, SP-3: Surface Preparation Methods
   2. SSPC PA-1: Shop, Field, and Maintenance coatings

1.05 SYSTEM DESCRIPTION

A. The Tnemec Series 945 Aerolon Thermal Tape, 60mil thickness (1.5mm), material shall be applied at the required thickness to provide the required R - Value of R - 0.17 to R- 4.
B. In no case, shall the K value be above, Thermal Conductivity (ASTM C177 at 79°F): 50 mW /m°K or 0.3446 BTU-in/ft²-hr-°F (R value at one-inch equals 2.9)

1.06 SUBMITTALS

A. Product Data: Submit product data including manufacturers technical data indicating product performance characteristics, performance, and limitation criteria.
B. Design Data: Submit published design listings for insulation value ratings and product thickness. Include evidence the thermal break tape testing was sponsored by the manufacturer and that the material tested was produced using manufacturer's specifications under the supervision of technical personnel.
C. Manufacturer's Instructions: Submit manufacturer written installation instructions.
D. Applicator Qualifications: Submit applicators current certification as a manufacturer trained applicator.
E. Manufacturers Qualifications: Submit manufacturer documentation that the insulative product complies with the specific contract requirements.

1.07 QUALITY ASSURANCE

A. Manufacturer:
   1. Company specializing in manufacturing product in this section with a minimum of 5 years documented experience in manufacturing thermal tape technology and high-performance coatings.
   2. Applicator: Company specializing in applying the work of this section with documented experience and trained by the manufacturer.
   3. Thermal Tape system shall be the complete system from a sole source consisting of primer, acrylic thermal break material and topcoat. All materials shall be LEEDv4 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 two square feet on representative substrate, where directed by the Engineer, for each different desired R Value and finish 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 tape adhesion, coating shrinkage, temperature, and humidity.
      d. Where delamination, shrinkage, and/or cracking are evident, adjust mixture and method of application as necessary to meet required installation, adhesion, R Value, finish, and color requirements.
      e. Continue to provide mock-up areas until acceptable areas are produced.
      f. Acceptable areas shall constitute standard of acceptance for method of application, thickness, finish texture, and color requirements, for thermal tape material applications.

1.08 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 numbers, product identification and quantities shall be recorded on appropriate QC documents. A copy of the transport document certificate shall be attached to the material delivery on site.

1.09 PROJECT/SITE CONDITIONS

A. Project Environmental Requirements: Substrate, air temperature, and relative humidity shall be in accordance with the manufacturers' requirements.
   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 hours 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 Tnemec Series 945 Aerolon Thermal Tape when temperature of substrate and/or surrounding ambient air temperature is below 40°F. Temporary protection and heat shall be maintained at this minimum temperature for 24 hours before, during and 24 hours after material application. Heat guns may be required to enhance adhesion of Tnemec Series 945 Aerolon Thermal Tape, by warming the substrate and/or the tape itself.
   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 hours prior, during the application of the material and 24-hour cure period.
   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 85% 24 hours prior, during and 24 hours after the application of the material. The relative humidity shall not exceed 75% throughout the application and curing of the decorative top coat finish.

1.10 WARRANTY

A. Provide a manufacturer's warranty and applicators workmanship warranty under the provisions detailed in AIA Masterspec, current edition.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Tnemec Company – Tnemec Series 945 Aerolon Thermal Tape of Kansas City, MO – A Thermally Insulative Tape

B. Primer Shop applied or field applied (Note to specifier coordinate with section (05100 or 05500) coating shall be Tnemec Series 90-97 Tneme-Zinc, Series 394 PerimePrime, Series V530 Omnithane or Series 1224 Epoxoline WB, manufactured by Tnemec Company; Topcoat shall be Tnemec Series 1095 EnduraShield and shall be applied in accordance with the manufacturer's documented instructions**.** Tnemec Series 945Aerolon Thermal Tape shall be applied in layers of 60 mils (1.5mm) at an R Value of (R-0.17 to R1) and shall be applied in accordance with the manufacturer's documented instructions**.**

C. Primer coating: For Steel or Concrete Thermal Tape requirements Tnemec Series 90-97 Tneme-Zinc, Series 394 PerimePrime, Series V530 Omnithane or Series 1224 Epoxoline WB, surface tolerant inorganic epoxy conforming to the following requirements:
   1. Bond strength: ASTM D4541 1320 psi
   2. Abrasion Resistance ASTM 4060 181 mg
   3. Cathodic Disbondment ASTM D G8- No disbondment 3000 Hrs.
   4. Water Vapor Transmission ASTM D 1653 4.68 g/m2 /24hrs/<0.22 prms

D. Tnemec Series 945 Aerolon Thermal Tape, conforming to the following requirements: Material may be shop or field applied.
   1. Recommended thickness 60-300 mils applied in multiple applications to specified R Value
   2. Must meet ASTM C177- No more than 50 mW/ m°K @ 79°F
   3. Storage Temperature 40º F Maximum 110º F
   4. Number of components – one component
   5. Primer required – as recommended by manufacturer
   6. Topcoat required – Required See Section 09 97 13.00 40 Section 2.0 and 3.0

2.02 THERMAL RESISTANCE

A. Thermal Conductivity (ASTM C177 at 79°F): 50 mW/ m°K or 0.3446 BTU-in/ft²-hr-°F (R value at one-inch equals 2.9) Tnemec Series 945 Aerolon Thermal Tape is to be applied in 60 mil (1.5mm) lifts to desired R value established by designer.

   Performance Data

   - ASTM D903 - 180º peel strength
   - ASTM C177 - 0.0497 W/mºK @79 ºF
   - ASTM E96 – WVT of 21.518g/m^2/hr
   - ASTM E84 – Class A
   - ASTM D4585 – 5,000 hours humidity with no effect

PART 3 - EXECUTION

3.01 EXAMINATION

A. All surfaces to receive the specified Tnemec Series 945 Aerolon Thermal Tape, per manufacturers printed instructions shall be 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.
B. Other corrections of the surfaces to receive the Tnemec Series 945 Aerolon Thermal Tape material shall be the responsibility of the Contractor at no additional cost to the Owner.
C. Application of the primer, Tnemec Series 945 Aerolon Thermal Tape and topcoat (if required) shall not commence until the contractor, applicator and inspector have examined the surfaces to receive the primer and determined the surfaces are acceptable to receive the primer and Tnemec Series 945 Aerolon Thermal Tape. Commencement of application means acceptance of substrate.
D. Verify that substrate and workspace temperature and humidity conditions are in accordance with manufacturers recommendations.

3.02 PREPARATION

A. Provide masking, drop cloths or other suitable coverings to prevent overspray onto surfaces not intended to be coated with thermal tape primer and topcoat.
B. Clean substrate (Steel or Concrete) free from dust, dirt, grease, paint, or other foreign substances that would impair the bond of the primer materials.
C. If required, Abrasive blast-clean the steel substrate in accordance with SSPC SP-6 Standard and in the shop prime with Tnemec Series 90-97 Tneme-Zinc, Series 394 PerimePrime, Series V530 Omnithane or Series 1224 Epoxoline WB. Surface profile shall be 2-3 mils if used for exposed steel; for steel buried in wall sections or covered and not exposed SSPC-SP 2 or 3 may be used with Tnemec Series 394 PerimePrime. For Concrete surfaces where is needed grind all surfaces to receive primer and use Tnemec Series 1224 Epoxoline WB or Series V530 Omnithane.
D. Weld spatter and defects shall be ground smooth prior to commencement of primer and Tnemec Series 945 Aerolon Thermal Tape material.
E. 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

3.03 APPLICATION

A. Equipment and application procedures shall conform to the manufacturer's application instructions. The Tnemec Series 971 Aerolon Acrylic Insulative Coating material shall be applied at the required dry film thickness (DFT) per the appropriate R- value specified or called for on drawings. When used in conjunction with Tnemec Series 945 Aerolon Thermal Tape these spray applied materials are compatible with each other, it is recommended to apply the Tnemec Series 945 Aerolon Thermal Tape first followed by spray applied versions.
B. Apply Tnemec Series 945 Aerolon Thermal Tape at 60 mils per layer. Subsequent layers may be applied until final DFT is achieved for required R value. More material is required for tube steel accounting for two heated perimeters at 120+ mils DFT, see Tnemec Representative for engineering interpretation as required.

3.04 FIELD QUALITY CONTROL

A. The engineer shall select and the owner will pay for an independent testing laboratory to inspect and verify the application of material in accordance with the provisions of Tnemec Company.
B. The Tnemec Series 945 Aerolon Thermal Tape material inspection and testing shall be performed 24 hours after completion of final application.
C. The results of the above tests shall be made available to all parties at the completion of each pre-designated area and approval.
D. In-place material not in compliance with desired R Value per specification requirements shall be corrected prior to final approval.

3.05 CLEAN UP AND REPAIR

A. Upon completion of installation, all excess material, overspray and debris shall be cleared and removed from the job site.
B. Remove overspray materials from surfaces not required to be thermally protected.
C. All 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.

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