



DuraTite[®] Spray Polyurethane Foam (SPF) Roofing Program

Application Guide Specifications SPF and Coating over Metal

PART 1 — GENERAL

1.1 DESCRIPTION

- A. These Application Guide Specifications outline the materials, methods and conditions required for the proper application of the **Rhino Linings DuraTite[®] Spray Polyurethane Foam (SPF) roofing system and coatings on an existing Metal Roof**. Actual application requirements may vary and are the responsibility of the contractor.
- B. This guideline does not outline all procedures for preparation and finishing of penetrations, drains, flashings, etc. This work should be outlined separately by the contractor/applicator before the work commences and shall be performed in a manner consistent with best trade practices.
- C. Compliance with all Application Guide Specifications contained herein is required for participation in the **Rhino Linings[®] DuraTite[®] Warranty Program**.
- D. Prior to the start of a project a Rhino Technical Representative must inspect the proposed project and give written approval before project is eligible for participation in the **Rhino Linings[®] DuraTite[®] Warranty Program**.

1.2 APPROVED CONTRACTOR

- A. All Rhino Linings DuraTite[®] coatings and products shall be applied by a Rhino Approved Contractor.

1.3 SUBMITTALS

- A. Product data shall consist of product Safety Data Sheets (SDS) and Technical Data Sheets (TDS) and Application Guide Specifications.
- B. Additional installation procedures from Rhino Technical Representative as required for any unique roof characteristics or desired performance standards.

1.4 PRODUCT HANDLING, STORAGE, & SAFETY

- A. Materials shall be delivered to jobsite or contractor in original, unopened containers with manufacturer's original labeling intact and clearly displaying product name, safety information, and batch/lot numbers.
- B. Material shall be handled in accordance with manufacturer's storage and handling requirements as outlined on Technical Data Sheets (TDS) and shall comply with local fire & safety requirements.



- C. Material that appears to have been damaged or frozen in transit, or bearing any other visible defect shall not be used or installed and shall be immediately removed from work site and returned to manufacturer upon discovery.
- D. Prior to SPF roof installation all who are going to be present during installation shall review CPI Bulletin AX-205, "Working with MDI and Polymeric MDI: What You Should Know".
- E. Prior to SPF roof and/or coating installation all who are going to be present during installation shall review appropriate Safety Data Sheets (SDS) provided by manufacturer.
- F. Prior to SPF roof and/or coating installation contractor must post all appropriate hazard signs in accordance with OSHA jobsite safety standards and take appropriate measure to notify building occupants and jobsite workers of any potential risks if necessary.

1.5 JOBSITE CONDITIONS

- A. Contractor shall not proceed with application of any DuraTite[®] SPF or coatings unless jobsite conditions and weather conditions are acceptable as specified by manufacturer on product Technical Data Sheets (TDS).
- B. No other trades are permitted to be on the roof during the application of any DuraTite[®] SPF or coating.
- C. All HVAC equipment should be turned off during the application of SPF and coating.
- D. Air intake vents, blowers, air conditioning units and evaporative coolers shall be disconnected or otherwise modified to prevent fumes from entering into the building or from contaminating the roof surface with condensate water.
- E. It is the responsibility of the contractor to protect unrelated work areas or surfaces near by the application work area to prevent overspray damage.

PART 2 — PRODUCTS

2.1 SPRAY POLYURETHANE FOAM (SPF), COATINGS AND RELATED MATERIALS

- A. All Materials used shall be supplied by Rhino Linings and shall meet specifications and physical properties as outlined in product Technical Data Sheets (TDS).
- B. Materials approved for use in the Rhino Linings DuraTite[®] Spray Polyurethane Foam (SPF) Roofing Program include:
 - 1. DuraTite[®] CC - SPF available in 2.5 – 3.5 lbs. /cu. ft. densities
 - 2. DuraTite[®] 1065 - Aliphatic Acrylic Base & Top Coat
 - 3. DuraTite[®] 1070 - High Solids Acrylic Base & Top Coat
 - 4. DuraTite[®] 1175 - Aluminized Aromatic Urethane Base & Top Coat
 - 5. DuraTite[®] 1285 - White Aliphatic Urethane Base & Top Coat
 - 6. DuraTite[®] 1380 - Silicone Base & Top Coat
 - 7. DuraTite[®] 1395 - High Solids Silicone Base & Top Coat
 - 8. DuraTite[®] 2185 - Polyurea Hybrid Base & Top Coat



2.2 WARRANTY

- A. Rhino Linings offers at no charge a Manufacturer's Defect Warranty, which warrants that supplied material will be free from defect and will meet or exceed physical properties as published. Any material found to have a manufacturer defect shall be replaced at Rhino's expense. This guarantee does not cover incidental or consequential damages, labor, loss of production, or any other damages of any kind. The sole remedy for a claim of defective material shall be limited to replacement of defective material only.
- B. The **Rhino Linings® DuraTite® Warranty Program** is available for an additional fee for qualifying roof projects. Fees are assessed based on size of roof and length of desired warranty.
- C. The **Rhino Linings® DuraTite® Warranty Program** does not cover encapsulated moisture or substrates that are wet. A thorough roof inspection must be performed and all areas of the roof where the substrate contains moisture must be removed and repaired according to roof manufacturer specifications.
- D. Rhino Linings does not warrant or guarantee any coating discovered to be installed improperly per manufacturer's application specifications outlined on product Technical Data Sheet (TDS) and contained herein.
- E. The contractor guarantees that workmanship will be free of defects in SPF and coating application. Due to the fact that the performance of existing roof substrate or previously applied coatings are beyond the control of Rhino Linings or the contractor, requests for additional warranty coverage shall be subject to prior approval by Rhino Linings.
- F. Compliance with the guide specifications contained herein is required for participation in the **Rhino Linings® DuraTite® Warranty Program**.
- G. Prior to the start of a project an Rhino Technical Representative must inspect the proposed project and give written approval before project is eligible for participation in the **Rhino Linings® DuraTite® Warranty Program**.
- H. Participation in the **Rhino Linings® DuraTite® Warranty Program** will require some or all of the following: third-party inspection upon completion of work, intermittent roof inspections by a Rhino Technical Representative throughout warranty term, participation in an annual roof maintenance program by Rhino Approved Contractor.
- I. Protection of building and occupants shall be the exclusive responsibility of the contractor. All surfaces not to receive system specified shall be protected from overspray hazard, i.e. windows, doors, exterior and vehicles. Protective coverings shall be secured against wind and shall be vented if used in conjunction with applications preventing collection and moisture.
- J. The **Rhino Linings® DuraTite® Warranty Program** shall be issued within 30 days of final payment and completion of successful Third Party inspection.
- K. For warranty eligibility contractor must provide proof of general liability insurance prior to job start.

- L. A roof surface with water or ponds present after 48 hours following a rain event shall be considered unacceptable for installation of foam and/or coating unless approved of in writing by an authorized Rhino Technical Representative.

NOTE: Ponding water is a sign of possible mechanical failure in the roof. Water must be intentionally diverted from ponding areas using accepted roofing practices and low areas in any roofing system should be inspected for structural integrity.

NOTE: The DuraTite® urethane, silicone, and polyurea coatings are chemical or moisture curing products and as such are not affected by ponding water, however, The National Roofing Contractors Association considers ponding water on any roof undesirable and recommends that all roof systems be designed and built to ensure positive drainage. (See the NRCA Roofing and Waterproofing Manual).

NOTE: The DuraTite® acrylic systems are evaporative cure products and are not recommended for use on roofs where ponds are present.

PART 3 — INSTALLATION

3.1 SURFACE PREPARATION

- A. Preparation shall include all requirements contained herein and potentially additional requirements as specified by Rhino Linings after roof inspection to ensure proper adhesion and performance of coatings. An adhesion test is required and shall be the responsibility of the contractor for all roofs participating in the **Rhino Linings® DuraTite® Warranty Program**. New galvanized metal flashings and surfaces must be allowed to cure a minimum of 90 days prior to application or treated with surface conditioners approved by the manufacturer.
- B. Surface preparation shall include, but not be limited to the following:
 - 1. All unnecessary and non-functional equipment and debris shall be removed from the roof.
 - 2. All loose gravel, dust and residue shall be removed using power vacuum equipment, power sweeper, air blowing, or other suitable means.
 - 3. Oil, grease, and other contaminants shall be removed with appropriate cleaning solutions and or methods.
 - 4. Lightning rods shall be masked prior to foaming. Lightning rod cables shall not be embedded in the polyurethane foam and should be removed prior to foaming. Electrical and mechanical conduits should be relocated or raised above the finished roof surface. Only qualified personnel must install lightning protection equipment and perform electrical work.
 - 5. All soft mastic or other materials that impede polyurethane adhesion shall be removed or covered with a mechanically fastened recover board.
 - 6. Remove or refasten all loose base flashing, counter flashing and gravel stops as required.
 - 7. The roof may require structural design analysis to determine expansion joint requirements. Existing expansion joints should be inspected and repaired if necessary.



8. The roof shall be thoroughly inspected or tested to determine if moisture is present within the roof assembly. Saturated insulation and substrate materials must be removed and replaced with compatible materials.
 9. Fasteners & Gutter Straps must be re-tightened; all stripped fasteners must be replaced with larger diameter fasteners, and the area re-secured by adding a new fastener next to the one that was stripped. All missing fasteners must be replaced.
- C. Metal Deck Preparation shall include, but not be limited to the following:
1. The metal roof deck shall be constructed of minimum 22-gauge steel. Construction shall conform to local building codes.
 2. Ferrous Metal: Sandblast iron and steel surfaces which are not primed, shop painted, or otherwise protected in accordance with SSPC SP-6, Commercial Blast Cleaning. Remove loose rust and unsound primer from shop-primed iron and steel surfaces by scraping or wire brushing.
 3. Non-Ferrous Metal: Clean and/or prime galvanized metal, aluminum, and stainless steel surfaces using appropriate system cleaners and primers. Contact your Rhino Technical Representative for recommendations.
 4. If the metal surface is free of loose scale, rust, weathered or chalking paint, it can be cleaned using compressed air jet, vacuum equipment, and hand or power broom to remove loose dirt. Grease, oil or other contaminants shall be removed with proper cleaning solutions.
 5. Fluted metal decks require a suitable method of covering or filling the flutes prior to polyurethane foam application. Flutes may be covered with mechanically fastened rigid board stock, open weave mesh reinforcing fabric, or filled with pre-cut board stock or spray applied polyurethane foam.
 6. Lightning rods shall be masked prior to foaming. Lightning rod cables shall not be embedded in the polyurethane foam and should be removed prior to foaming. Electrical and mechanical conduits should be relocated or raised above the finished roof surface. Only qualified personnel must install lightning protection equipment and perform electrical work.
- D. Other Surfaces (i.e. gypsum board, polyisocyanurate board)
1. These materials are generally used over fluted metal decks and must be fastened to achieve necessary wind uplift requirements.
 2. Boards shall be firmly butted together along all edges without gaps or openings. Joints exceeding 1/4 inch shall be caulked with a suitable sealant material.
 3. Special care must be taken to prevent these materials from getting wet in storage on the job site and after installation prior to being protected by polyurethane foam. Moisture exposure will damage these materials and may be a cause for replacement.

4. Remove loose dirt and debris by using compressed air, vacuum or light brooming. No power brooming is permitted due to possibility of damage.
5. The installed materials shall be protected from spills of contaminants such as oil, grease, solvents, etc., as these materials cause soiling that cannot be readily removed from the board surfaces.

3.2 PRIMER APPLICATION

- A. A Rhino Technical Representative prior to installation shall specify the appropriate primer and application rate based on substrate condition.

3.3 SPRAY POLYURETHANE FOAM (SPF) APPLICATION

A. Adhesion Test & General Roof Inspection

1. An adhesion test should be conducted to ensure proper adhesion to the existing substrate. Note that adhesion to any existing roof substrate depends on the condition of the substrate surface.
2. Prior to application of the foam, the surface shall be inspected to ensure that conditions required by the manufacturer have been met.

B. Application of SPF

1. The spray polyurethane foam shall be applied in accordance with the manufacturer's specification and instructions outlined on Technical Data Sheets (TDS).
2. Areas to be built-up to remove ponding water are to be filled in with spray polyurethane foam before the specified thickness of polyurethane foam is applied to the entire roof surface.
3. The spray polyurethane foam must be applied in a minimum pass thickness of one (1) inch.
4. Spray polyurethane foam thickness shall be a minimum of 1.5 inches. The polyurethane foam shall be applied uniformly over the entire surface with a tolerance of plus 1/4" per inch of thickness minus 0", except where variations are required to insure proper drainage or to complete a feathered edge. Foam thickness specifications are based on individual substrates waterproofed. Contact your Rhino Technical Representative for recommendations.
5. The spray polyurethane foam shall be uniformly terminated a minimum of eight (8) inches above the roofline at all penetrations (except drains, parapet walls, or building junctions). Foamed in place cants shall be smooth and uniform to allow positive drainage.
6. When detailing skylights or high walls care must be taken to assure weep holes are not covered with SPF or coating.
7. Substrate shall have sufficient slope to eliminate excessive ponding water. Ponding is defined as "The accumulation of water in low-lying areas that exceeds the

manufacturer's specification and/or contract documents." If the substrate does not have sufficient slope, then the ponding water must be eliminated by building in slope by the application of polyurethane foam, channeling the polyurethane foam or by the proper placement of drains, or a combination thereof.

8. The full thickness of polyurethane foam in any area shall be completed prior to the end of each day. If due to weather conditions more than 24 hours elapse between polyurethane foam and coating application, the polyurethane foam shall be inspected for UV degradation, oxidation or contamination. If any of the above conditions exist, the surface shall be prepared in conformity with the recommendations of the manufacturer issuing the warranty.

C. Surface Finish

1. The final sprayed polyurethane foam surface shall be "smooth, orange peel, coarse orange peel, or verge of popcorn." Polyurethane foam surfaces termed "popcorn" or "tree bark" are not acceptable. These areas shall be removed and re-foamed to an acceptable surface.
2. Any damage or defects to the polyurethane foam surface shall be repaired prior to the protective coating application.
3. Prior to installation of coating the polyurethane foam surface shall be free of moisture, frost, dust, debris, oils, tars, grease or other materials that will impair adhesion of the protective coating.

3.4 COATING APPLICATION

A. Inspection

1. Prior to the application of the protective coating the polyurethane foam shall be inspected for suitability of base coat application as per manufacturers' requirements.

B. Application

1. Base Coat

- a. The base coat shall be applied the same day as the polyurethane foam application when possible. In no case shall less than two hours elapse between application of the polyurethane foam and application of the base coat.
- b. If more than 24 hours elapse prior to the application of base coat, the polyurethane foam shall be inspected for UV degradation.
- c. The polyurethane foam shall be free of dust, dirt, contaminants and moisture before application of the base coat. The polyurethane foam shall be clean, dry, and sound.
- d. The base coat shall be applied at a uniform thickness with the rate of application being governed by the polyurethane foam surface texture. Coatings shall be applied at such a rate to give the minimum dry film thickness specified by the protective coating manufacturer.

- e. The coating shall be allowed to cure and be inspected for pinholes, thinly coated areas, uncured areas or other defects. Any defects should be repaired prior to subsequent applications. The base coat shall be free of dirt, dust, water, or other contaminants before application of the top coat.
- f. The coating application shall not proceed during periods of inclement weather. The applicator shall not apply the protective coating below the temperature and/or above the humidity specified by the manufacturer for ambient air and substrate. Wind barriers may be used if wind conditions could affect the quality of installation.

2. Top Coat and/or Subsequent Coat

- a. Subsequent coating should be applied in a timely manner to ensure proper adhesion between coats. Surface texture of polyurethane foam will affect dry film thickness—additional material may be required in areas of coarse foam profile.
- b. The cured dry film thickness of the finished multiple coat application shall be checked by taking slit samples and examining under magnification. Areas that are found to have less than the thickness specified shall require additional coating.

NOTE: Contact your Rhino Technical Representative for recommendations regarding application of DuraTite® SPF and coatings for specific roofing details.

3.5 APPLICATION RATES

NOTE: Depending on the surface texture of the spray foam it may be necessary to add a factor of approximately 5-10% to accurately determine application surface area.

Base Coat: Base coat shall be applied no sooner than 2 hours after and not longer than 24 hours after application of spray foam. Base coat must be allowed to dry for 24 hours depending on humidity and temperature. Acrylic system is not recommended for roofs that have poor drainage or ponding water. Contact your Rhino Technical Representative for recommendations.

Successive Coats: Successive coats shall be applied perpendicular to previous coat. Successive coats must be allowed to dry for 24 hours depending on humidity and temperature.

The following specified Dry Film Thickness (DFT) is the minimum requirement for warranty eligibility. Warranties listed below are the **Rhino Linings® DuraTite® Warranty Program**.

A. DuraTite® 1065 & 1070 - Acrylic Coatings

- 10-Year: 12 mils DFT per coat - total DFT 24 mils
*over SPF only, total DFT 32 mils

B. DuraTite® 2185 - Polyurea Hybrid

- 10-year: 25 mils DFT – single coat
- 15-year: 35 mils DFT – single coat

- 20-year: 50 mils DFT – single coat

C. DuraTite® 1175 & 1285 - Urethane Coatings

- 10-year: 10 mils DFT per coat – total DFT 20 mils
- 15-year: 15 mils DFT per coat – total DFT 30 mils
- 20-year: 14 mils DFT per coat – total DFT 40 mils

D. DuraTite® 1380 & 1395 - Silicone Coatings

- 10-year: 18 mils DFT per coat – total DFT 18 mils
- 20-year: 12 mils DFT per coat – total DFT 36 mils
- 30-year: 18 mils DFT per coat – total DFT 72 mils

3.6 GRANULE APPLICATION & WALK PADS (OPTIONAL)

- A. Depending on the type of warranty requested for project, roofing granules may be required for this system.
- B. Granules, when required, should be embedded in the top coat while it is still wet.
- C. Granules should be broadcast to rejection at a rate of 30-40 lbs per 100 square feet using a method recommended by the granule manufacturer.
- D. If necessary an additional finish coat may be applied at the rate of 3/4 gallon per 100 square feet for the purpose of application of granules. Immediately following finish coat, broadcast roofing granules into finish coat at the rate of 30-40 lbs per 100 square feet.
- E. Do not allow traffic on finished area for at least twenty-four (24) hours after granule application is completed.
- F. After forty-eight (48) hours, remove all excess loose granules with soft bristled broom, blower, or vacuum.
- G. Walk pads (walkways) may be installed for heavy traffic areas and around frequently serviced roof top units.

3.7 RESTRICTIONS / LIMITATIONS

These systems are to be used only in conjunction with commonly accepted roofing standards but not limited to the following:

- A. No application of materials shall commence during inclement weather or when precipitation is imminent.
- B. No materials are to be applied to wet, dirty, or frozen surfaces.
- C. For warranty eligibility roof must have good draining with a minimum slope of 1/2 inch (0.5") per foot.



- D. In conjunction with the final inspection, all debris, containers, materials and equipment are to be properly removed from the job site. Grounds are to be cleaned, undamaged, and acceptable to the owner.
- E. Reflectivity of coatings may be reduced if roof surface is not cleaned on a regularly scheduled basis.
- F. Do not apply within two hours of sunset, rain, fog or freezing temperatures.
- G. All Rhino Linings DuraTite[®] acrylic coatings must be completely cured before exposing to water or to foot traffic.
- H. All Rhino Linings DuraTite[®] urethane, silicone, and polyurea coatings must be completely cured prior to exposing to foot traffic
- I. Keep Rhino Linings DuraTite[®] coating containers covered when not in use. Dispose of all containers in accordance with state and local environmental regulations.