

TECHNICAL BULLETIN

TO: FIRESTONE RED SHIELD CONTRACTORS
FIRESTONE DISTRIBUTORS
FIRESTONE SALES REPRESENTATIVES

NOVEMBER 2017

RE: COLD WEATHER APPLICATION GUIDELINES 2017-2018

Cold temperatures change the physical properties of adhesives, sealants, primers and coatings, and alter the handling characteristics of roofing membranes due to increased rigidity. The information in this bulletin is intended to help installers successfully apply Firestone materials in cold weather. Firestone recommends cold weather application procedures be used when ambient and substrate conditions fall below 40 °F (4 °C). Refer to the applicable Technical Information Sheets (TIS) for product specific recommendations.

ADHESIVES, SEALANTS, PRIMERS AND COATINGS

A. Storage

- **Store all adhesives, sealants, primers and coatings between 60 °F (15.6 °C) and 80 °F (26.7 °C) to ensure proper mixing and dispensing of the products, and promote appropriate application rates.**
- If the properties and application characteristics of the materials begin to change during cold weather application, restore them to room temperature. Materials stored below 60 °F (15.6 °C) must be brought to room temperature, thoroughly mixed and examined to verify proper consistency (no marbling or separation of components) prior to application. **NOTE: Never mix EPDM Solvent-Free Bonding Adhesive.**
- **DO NOT allow water-based and solvent-free products to freeze** (e.g., Water Based Bonding Adhesive-P; EPDM Solvent-Free Bonding Adhesive; SA-Water Based (WB) Primer; AcryliTop™ PC-100 coatings and Base Coats; Industrial Elastomeric Coatings and Base Coat). **Freezing renders these products permanently unsuitable for use.**

B. Mixing & Dispensing

- When liquid materials are cold, their viscosity increases, causing solvents and solids to separate. This separation can make mixing and dispensing difficult. To minimize the potential for materials cooling on the roof before application, follow these additional guidelines:
 - Only bring materials from warm storage to the roof 1 to 4 hours prior to application, or as necessary to ensure materials are close to 60 °F (15.6 °C) when dispensed.
 - Always thoroughly mix adhesives, primers and coatings to a smooth, uniform state before and during use. Follow mixing instructions provided with each product. Do not use mixing equipment that could generate a spark, which could ignite flammable material. **NOTE: Never mix EPDM Solvent-Free Bonding Adhesive.**
 - In extreme conditions, it may be necessary during application to rotate material between a hot box or warm storage area and the roof to maintain the appropriate application temperature.

C. Application

- Drying times depend on ambient conditions. Cool and overcast conditions lengthen open times (or “tack times”), while sunny and dry conditions shorten open times. Expect and plan for longer open times in colder weather prior to adhering insulation or membrane.
- Blisters may occur when membranes are installed using solvent-based adhesives or primers that have not sufficiently dried. During cold temperatures, a false reading may be given if a “touch-push” test is not performed properly. Be sure to conduct “touch-push” tests in areas with the heaviest application of adhesive or primer, using a clean finger and adequate pressure to verify solvents have flashed-off. Additionally, some products’ readiness may not be verified by a “touch-push” test, but should be determined instead by the specific open times for those products. Refer to the Firestone website for the most current TIS and applicable guidelines or instructions for each product.
- Do not apply water-based products when freezing temperatures are expected within 48 hours after application and do not apply solvent-free products when freezing temperatures are expected within 12 hours after application.
- Follow all local air quality management requirements when installing products containing Volatile Organic Compounds (VOC’s).

D. Solvent Evaporation Rates

The table below shows various flash-off times associated with solvent components of Firestone adhesives, sealants, primers and coatings. Our products may contain one or more of the solvents listed below. Because the ratios of solvents in each product vary, a definitive flash-off time for each product cannot be assigned. Reference the specific product's Safety Data Sheet (SDS) for chemical components and compare that information to the table below for an indication of

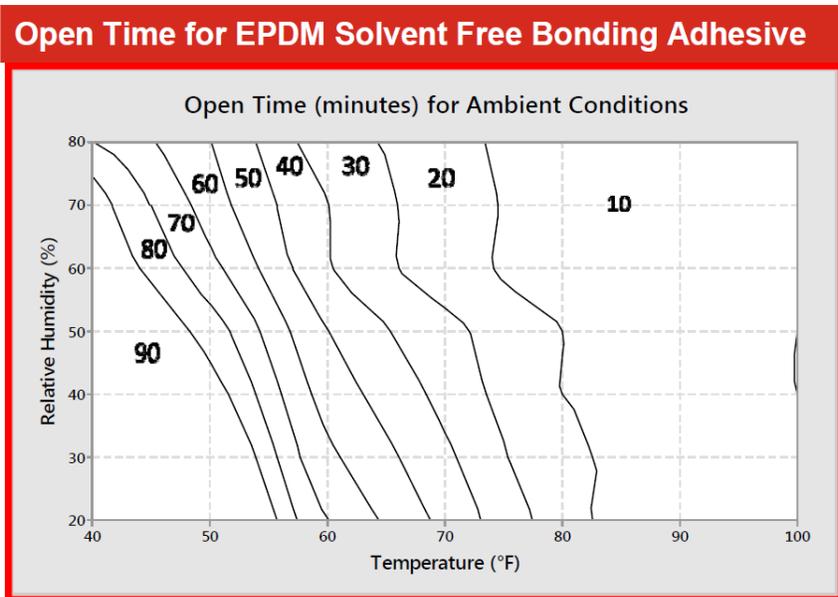
Solvent	VOC Exemption	Evaporation rate*	Relative flash-off
Water	VOC Exempt	0.3	Extremely Slow
PCBTF	VOC Exempt	0.9	Slow
Naphtha	Not VOC Exempt	1.4	Medium
Toluene	Not VOC Exempt	2.2	Medium
TBAc	VOC Exempt, except for applicable CA Air Quality Districts	2.8	Medium
Acetone	VOC Exempt	5.6	Fast
Hexane	Not VOC Exempt	8.3	Extremely Fast

relative flash-off efficiency. Ambient conditions will affect set-up times, but the effects are proportional.

* The standard reference for Evaporation Rate is n-butyl acetate with an evaporation rate of 1.0.

E. EPDM Solvent-Free Bonding Adhesive (SFBA)

- Store containers of SFBA at temperatures between 60 °F and 80 °F (16 °C and 27 °C) until ready for use. **DO NOT allow product to freeze.**
- Only use SFBA when ambient and substrate temperatures exceed 40 °F (4 °C). If SFBA is exposed to temperatures below 40 °F (4 °C), restore to room temperature before use. Do not use when temperatures will fall below freezing within 12 hours after installation.
- **Do not mix or agitate SFBA prior to installation** and remove any skin coat that may develop in the container to expose fresh adhesive for application.
- Conduct “touch-push” tests in areas with the heaviest application of SFBA and use adequate pressure to verify that sufficient open time has occurred to initiate curing of the adhesive. Compared to standard EPDM Bonding Adhesive, SFBA should be slightly easier to push with the finger when it is ready to bond to the membrane.
- **Although SFBA does not contain solvents, the adhesive must achieve its optimal open time to set up prior to installing the roofing membrane.** See chart below for the approximate open times for SFBA when the ambient Relative Humidity and Temperature are known.



G. Adhesive “Blushing”

- “Blushing” occurs when the evaporative cooling of the material during dry time lowers the surface temperature at or below the dew point, resulting in condensation on the adhesive/primer film. When “blushing” occurs, the condensation on the adhesive or primer prevents proper adhesion. Discontinue application immediately if blushing occurs.
- The use of adhesives and primers should be closely monitored when the ambient temperature is close to the dew point, keeping in mind that these temperature gaps are typically much narrower in the early morning and late afternoon. The use of adhesives and primers should be scheduled for midday to take advantage of the midday sun and the greatest difference between ambient and dew point temperature.

ROOFING MEMBRANES AND FLASHINGS

A. Membrane Preparation

- Store roofing membranes in a clean, dry location out of direct sunlight, and away from sources of punctures and physical damage.
- Prior to installation, unroll membranes and allow them to relax.
- During colder weather, folded membrane panels become more difficult to relax and install, especially with adhered systems. The use of no-fold panels in colder weather is highly recommended.

B. RubberGard™ EPDM SA and UltraPly™ TPO SA Installation

- RubberGard EPDM SA and UltraPly TPO SA membranes utilize Firestone’s SecureBond technology to adhere membranes to various horizontal roofing and vertical wall substrates. Refer to the [August, 2016 Technical Bulletin](#) for proper installation of EPDM SA and UltraPly TPO SA.
- Store EPDM SA and TPO SA in a clean, dry location and keep dry prior to installation.
- EPDM SA and TPO SA may be installed when ambient and substrate temperatures exceed 20 °F (-7 °C).

C. UltraPly TPO Installation

- TPO membranes become more rigid in cold temperatures. To help UltraPly TPO membranes relax (including all standard, SA and TPO XR membranes), early on the day of installation, remove the white outer wrapping and leave the roll in the sunlight as long as possible. This will enable the dark bottom ply of the TPO membrane to absorb as much heat as possible and increase the TPO membrane’s flexibility.
- To ensure seams are properly welded when using an automatic welder, it is critical that test welds are completed:
 - at daily start-up
 - when ambient conditions change
 - when welding stops for a significant period of time (e.g., lunch breaks)
- When using a hand welder, test welds should be performed on scrap membrane or flashing material to ensure the operator is using the proper technique and temperature setting.

D. UltraPly TPO InvisiWeld and InvisiWeld-S Induction Welded Systems

- The minimum safe application temperature for induction welding of the UltraPly TPO membrane to the InvisiWeld or InvisiWeld-S plates is 0 °F (-17.8 °C).
- Before induction welding with the appropriate tool, ensure that there is no moisture or condensation present on the top surface of the plate or on the bottom surface of the TPO membrane. Moisture will affect the ability of the induction tool to weld, and may result in partial or incomplete welds.
- Always follow the induction tool manufacturer’s guidelines for calibration and use of the tool in cold temperatures. In general, the tool must be calibrated regularly in real time **ON-SITE** using materials (membrane and plates) in the same temperature conditions as the jobsite materials.

E. RubberGard EPDM Flashing Installation

- Uncured EPDM flashing products (both standard and EcoWhite) are designed to be formable, but cold weather may require supplemental warming by using a heat gun during application.
- Care should be taken to keep heat guns away from cleaners, primers, adhesives or other flammable materials.
- Ambient conditions (sunlight, wind and temperature) and flashing color will determine the need for supplemental heat. Typically, temperatures below 60 °F (15.6 °C) may require the use of additional heat to ensure the formability of uncured flashing products.

F. SBS, APP and BUR Installation

- Store SBS and APP modified bitumen rolls and BUR ply felts between 50 °F and 100 °F (10.0 °C and 37.7 °C), and install when ambient and substrate temperatures are 40 °F (4.4 °C) and rising. Attempting to install asphalt-based products below 40 °F (4.4 °C) can reduce adhesion, resulting in delaminating or blistering during subsequent heating cycles.
- Materials must be used within 4 hours of removal from a heated storage area. Materials that are not used within 4 hours must be returned to a heated storage area until they return to 50 °F to 100 °F (10.0 °C and 37.7 °C), which typically takes 24 hours.
- **Hot Asphalt**
 - Cold substrates can rapidly cool mopped asphalt. Asphalt cools and thickens more quickly at low temperatures, which may cause application rates to be less uniform.
 - All handling equipment should be insulated to minimize drops in asphalt temperature prior to application.
 - **Asphalt temperature shall be of 420 °F (215.6 °C) minimum, and must be maintained at the point of application of the roofing membrane.**
 - Mop lead should be no more than five (5) feet (1.5 meters) from the roll.
 - Roll cap sheets into hot asphalt using positive pressure, ensuring proper side and end lap width.
 - Stop the operation and/or change to another container when asphalt temperature at the point of application cannot be maintained at 420 °F (215.6 °C).
 - Never overheat asphalt to compensate for cold weather conditions and never heat asphalt above its final mopping temperature or its flash point. Always remain within the asphalt manufacturer's approved application range, but never below 420 °F (215.6 °C).
 - Always follow OSHA and NRCA safety regulations.

G. Firestone Multi-Purpose MB Cold Adhesive and Flashing Cement

- Store Multi-Purpose MB Cold Adhesive and Multi-Purpose MB Flashing Cement between 60 °F to 80 °F (15.6 °C and 26.6 °C) in their original, unopened containers.
- Multi-Purpose MB Cold Adhesive is best applied during cold weather by use of a heated spray rig. Squeegee-applied Cold Adhesive is not recommended during cold weather. Ambient and substrate temperatures should be 40 °F (4.4 °C) and rising at the time of application.
- Firestone Multi-Purpose MB Flashing Cement should only be used when ambient and substrate temperatures are greater than 40 °F (4.4 °C) and rising.

BARRIERS AND UNDERLAYMENTS

A. Air and Vapor Barriers

- Enverge™ Air and Vapor Barrier SA (40 mil) and SA-Solvent Based (SB) Primer have a minimum installation temperature of 14 °F (-10 °C). The minimum installation temperature for Enverge Air and Vapor Barrier SA (25 mil) is 50 °F (10 °C).
- V-Force™ Vapor Barrier Membrane can be applied at ambient temperatures as low as 25 °F (-3.8 °C), provided the V-Force has been stored between 50 °F to 100 °F (10 °C to 37.7 °C) prior to application.

B. Underlayments

- Underlayments should be stored out of the weather in a clean, dry area in original, unopened packaging.
- CLAD-GARD™ R has a minimum application temperature of 40 °F (4.4 °C) at the time of application.
- CLAD-GARD SA has a minimum application temperature of 40 °F (4.4 °C) or 50 °F (10 °C) at the time of application, depending on region (north or south).
- CLAD-GARD SA-FR has a minimum application temperature of 40 °F (4.4 °C) at the time of application. However, when CLAD-GARD SA-FR will be installed under 50 °F (10 °C), Firestone recommends using SA-Water Based Primer (WB) or SA-Solvent Based (SB) Primer.

For further information or assistance, please contact please contact Quality Building Services at 800-428-4511.

Sincerely,



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