Rev 02/2022

# SECTION 07-56-12
# TRITOFLEX 2K MEMBRANE - LIQUID ROOF RECOVER SYSTEM

## FOR INSTALLATION OVER EXISTING GRAVEL SURFACED BUR SUBSTRATES

This specification works as a guideline and may be modified, as necessary, by the "Designer of Record" to fulfill the needs of the individual project. Any changes or improvements to the content of this specification should be made only with the written consent of the "Designer of Record."

## PART ONE - GENERAL

### 1.1 Description

A. Furnish and install an instant-setting, liquid-applied, roof membrane system complete, in place, as shown on the drawings, specified herein, or needed for a complete and proper watertight and warrantable installation. TritoFlex™ 2K Rubber liquid roof recover system shall be monolithically applied in one spray coat to the field and flashing areas at specified rate to create a membrane. TritoFlex 1K B Rubber is used as a patching and flashing reinforcement compound to the system as needed after it has cured. An energy efficient and sustainable elastomeric topcoat, TritoCryl™ 2K or TritoCryl 1K will then be applied to the entire roof surface for UV protection, water resistance, and thermal shock reduction. In some climate zones, there are options for either a granulated wear layer or no topcoat.

### 1.2 Quality Assurance

A. Standards: Comply with standards specified in this section and as listed in the General Requirements.

B. Qualifications of Manufacturer: The core products used in the roofing work and included in this section shall be manufactured directly by the manufacturer and not through a third-party mixing company or private label. Quality control measures include testing and retaining samples of every product batch by the manufacturer.

C. Qualifications of Installers: The Contractor and his personnel shall be currently approved by the manufacturer and only those spray technicians who have been certified through the manufacturer's training program are to spray the roof membrane.

D. Roofing Inspections: Make all required notifications and secure all required inspections by the manufacturer of the approved materials to facilitate issuance of the specified roof warranty.

E. Manufacturer's Pre-Review: The manufacturer shall review and approve the existing roof substrate that is to be recovered with the TritoFlex system with respect to the appropriateness of the substrate for use of their recover system on this project.

F. Spray Equipment: The TritoFlex 2K liquid roof membrane and TritoCryl 2K topcoat may only be applied with spray equipment specifically manufactured for TritoFlex 2K and TritoCryl 2K and supplied by Triton Inc.

### 1.3 Submittals

A. Product Data: Prior to project starting, submit:

i. Complete material list of all items proposed to be furnished and installed under this section along with product data sheets and SDS sheets for each.

ii. Manufacturer's pre-review comments and other data required to demonstrate compliance with specified requirements.

iii. Moisture scan findings using a Tramex moisture meter or an infrared camera to check for pre-existing moisture in the old roofing system that will require replacement prior to installation of the TritoFlex 2K liquid recover system.

## 1.4 Product Handling

A. Delivery and Storage:

i. Deliver all packaged materials to the job site in their original, unopened containers with all labels intact and legible at the time of the inspection.

ii. Store all materials in an approved manner and protected from freezing or extreme heat. Storage temperature to be maintained above 50 degrees Fahrenheit (10°C).

iii. Protect materials during handling and application to prevent damage or contamination.

B. Protection: Use all necessary means to protect the materials in this section before, during, and after installation, and to protect the work and materials of all other trades.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of and at no additional cost to the Owner.

## 1.5 Scheduling

A. Work is to be performed on a daily basis with appropriate scheduling of product applications to prevent contamination of the surfaces between applications. Products shall be installed only if temperatures do not dip below freezing for 72 hours after applying, and daytime temperature reaches 50 degrees Fahrenheit (10° C) or higher.

B. Final completion of work shall be defined as the installation of all specified primer, roof membrane, top coating, flashings, counterflashings, sheet metal, fasteners, and caulking.

C. Contractor shall complete installation of TritoFlex products within two (2) days after cleaning the existing substrate. After installation of the TritoFlex 2K rubber, a washing of the surface to remove dry accelerator is required prior to top coating, no earlier than 6 hours after TritoFlex 2K installation. Top coating not to occur before TritoFlex 2K and 1K are completely dried. If top coating is performed later than three (3) days after completion of TritoFlex 2K and 1K products, power washing is required to remove dust and dirt accumulations.

## 1.6 Warranty

A. As part of the work of this section, pay all required fees, secure all required inspections, and complete all items necessary to secure and deliver to the Owner a manufacturer's warranty of 10 years, 15 years, or 20 years as requested. All warranties are eligible for extensions.

| Duration | Covers* | TritoFlex 2K Thickness | Topcoat Thickness | Extendable |
|---|---|---|---|---|
| 10 Years | Material & Labor Costs | 97 wet/60 dry mil | None | Yes |
| 15 Years | Material & Labor Costs | 97 wet/60 dry mil | 30 wet/20 dry mil | Yes |
| 20 Years | Material & Labor Costs | 130 wet/80 dry mil | 50 wet/30 dry mil | Yes |

**Workmanship warranties available upon request*

B. Contractor to provide photographs of areas to receive liquid membrane before start of work, during surface preparation, during spray application, and at completion of work for warranty acceptance.

## PART TWO - PRODUCTS

### 2.1 General

A. Minimum product requirements have been listed. All of these components must be used and bid. Products not supplied by the manufacturer are to be purchased from a manufacturer approved source.

### 2.2 Products Supplied by Warranty Manufacturer

A. 2K Liquid Membrane – Two-Component, Cold Spray-Applied Synthetic Rubber (TritoFlex 2K)

Spray-applied, instant-setting liquid-applied membrane manufactured by Triton Inc. and applied by a manufacturer certified installer to create a waterproofing membrane. The liquid TritoFlex 2K product is water-based and solvent-free, which transforms into an instant-setting seamless rubberized roof membrane as it is spray-applied to the substrate and catalyzed by an accelerator component. The liquid is spray-applied in a single coat to achieve a minimum monolithic membrane thickness of either 60 dry mils for 10-year or 15-year warranties, or 80 dry mils for 20-year warranties, and possess physical properties of no less than the values listed below:

| Property | Test Method | Value |
|---|---|---|
| Solid Content | Vacuum cure | 63% |
| Flame Exposure | ASTM E108 | Class A, Self-Extinguishing |
| Water Vapor Permeability | ASTM E96 | 0.1 perms |
| Elongation | ASTM D412 | 1200% or greater |
| Tensile Strength | ASTM D412 | 500 psi or greater |
| Hydrostatic Pressure | BS EN 12390-8 | Pass – No penetration |
| Impact and Hail Resistance | ASTM D3746 | Pass |
| Dynamic Puncture Resistance | ASTM D5635 | 2.80 J/mm or greater |
| Pull-Off Adhesion to Cap Sheet (1000 hr UV) | ASTM D4541 | 700 psi or greater |
| 1000 hr UV Exposure (Xenon) | ASTM G155 | No effect |
| Cured to the Touch | After Sprayed | Instantly |
| VOC Content | -- | None |
| Wind, Fire, Hail, Foot Traffic, UV | FM 4470 | Pass (Class A, Severe Hail) |

B. Patching and Flashing Membrane – One-Component, Brush-Applied Rubber

i. TritoFlex 1K B – Brush-applied, water-based, solvent-free, single-component waterproofing membrane manufactured by Triton Inc. Product is used for touch-up patching and reinforcing of flashing areas in the TritoFlex 2K membrane.

C. Reflective/ Protective Topcoat *(Select the appropriate coating that meets the building requirements)*

i. TritoCryl 2K: Highly reflective, instant-setting, water-based acrylic elastomeric topcoat manufactured by Triton Inc. It is spray-applied to the substrate using specialized equipment manufactured by Triton Inc. and catalyzed by an accelerator component. Available in white only.

ii. TritoCryl 1K: Highly reflective, water-based acrylic elastomeric topcoat. It is spray-applied using standard airless spray equipment, brush-applied, or roller-applied. Manufactured by Triton Inc. and typically provided in white, gray, or tan. Custom colors available upon request.

D. Catalyst (Accelerator)

i. 2K ACCELERATOR: Specialty non-toxic, food-grade Calcium Chloride (CaCl) and water mixture used as the catalyst component in conjunction with spraying the TritoFlex 2K Rubber and TritoCryl 2K Top Coat, allowing for the rapid build-up of the membrane to any thickness desired in one coat. The dry CaCl mixture is supplied by Triton, Inc. and the applicator mixes with water per the manufacturers' requirements on the job site. Alternate catalysts are in no way allowed, as they will cause damage to the final product.

E. Walkways

i. TritoWalk: Water-based acrylic elastomeric coating used as a seamless walkway coating. Contains on aggregate to form a textured, non-slip surface with high abrasion resistance. TritoWalk can be reinforced with polyester fabric to provide a higher level of protection from equipment damage in areas of high abuse. Available in gray or yellow; supplied by Triton, Inc.

F. Reinforcement Fabric

i. PolyFab: High-strength polyester fabric, used to reinforce high-stress and high-movement areas underneath the TritoFlex 2K product or within the TritoFlex 1K product.

## 2.3 Equipment Supplied by Manufacturer

A. Spray machine and testing gauges/meters

i. Triton High Production Spray Machine: dual-component spray rig consisting of spray gun, hoses, pumps, and cart, specifically manufactured and supplied by Triton, Inc.

ii. TritoFlex 2K mil gauge for testing wet mil thickness while spraying the liquid membrane.

iii. Standard paint mil gauge for testing wet mil thickness of TritoCryl 2K or TritoCryl 1K topcoat.

# PART THREE - EXECUTION

## 3.1 Description

A. The latest manufacturer application techniques are to be followed along with the following requirements. These specific minimum requirements must be included in the bid and are not to be altered.

## 3.2 Inspection

A. Examine the existing roof conditions under which work in this section will be installed. Correct conditions detrimental to the proper and timely completion of the work such as wet underlying insulation, loose membrane, and severe degradation. Do not proceed until such conditions have been corrected.

## 3.3 Surface Conditions

A. Surfaces scheduled to receive waterproofing are to be sound, clean, dry and free of any dust, grease, oil, laitance, and other contaminants.

B. Substrate is to be free of sharp projections and free of loose components.

C. The existing roof system is to be scanned for moisture to locate and replace any wet areas of insulation, trapped moisture, or, if applicable, wet gypsum deck, with new insulation and membrane to match existing. Insulation and membrane replacement must be properly attached prior to application of TritoFlex 2K system.

## 3.4 Installation – Preparation of Substrate

A. Protect all adjacent surfaces from overspray at all times. Taping off surfaces with painter plastic to prevent overspray onto surfaces and to establish clean straight edge termination lines on the new liquid membrane flashings is required. Use care when masking air intakes and HVAC units so as not to block all ventilation and potentially damage the unit.

B. All existing gravel surfacing must be spudded and removed before pressure washing.

   i. All loose gravel is to be either power broomed or vacuumed to reveal the gravel surfacing still embedded in the flood coat.

   ii. Spud all embedded gravel with a power planer. Use care to prevent cutting or puncturing the BUR felts during spudding. If any damage is caused, make necessary repairs immediately with approved materials.

   iii. After the entire surface has been spudded, use either a power broom or vacuum to remove the spudded debris from the roof surface.

C. Repair all defects in existing substrates including; loose field membrane and flashings, open laps and corners, and severe alligatoring as required by manufacturer. Self-adhering modified bitumen membrane is recommended for repairs to the existing roof.

D. All existing metal flashings that are specified to remain must be inspected for watertightness. Any flashing metal such as counterflashing, termination bar, coping caps, edge metal, etc., shall be properly repaired or replaced to achieve a watertight condition. Consult with Manufacturer for further clarification.

E. Remove all dirt, debris, and loose materials from the surface of the roof.

F. Existing surfaces shall be cleaned with pressure washing equipment to a condition conducive to positive adhesion of the TritoFlex 2K, per manufacturer's requirements prior to application of the liquid-applied system. Unapproved curing compounds, form release agents, petroleum distillates, animal fats, and other contaminates shall not come into contact with approved substrate after cleaning. Contractor shall complete installation of TritoFlex 2K membrane within two (2) days after cleaning of substrate. If more than two (2) days have passed, the substrate must be pressure washed again. The surface must be completely free of any residue, dust, or dirt after washing. No residue or debris should wipe off onto a cloth or hand.

G. Verify the substrate is visibly dry on the surface and free of moisture within its components. Moisture meters, infrared scanning, or capillary moisture tested by plastic sheet method according to ASTM D-4263, may be necessary. If moisture is present on the substrate it must be allowed to dry prior to proceeding with TritoFlex 2K application. If moisture is present within the old roofing system components, they must be removed and replaced with same materials prior to installation of TritoFlex 2K. It is important that shrinkage or stress in the old roofing material be relieved after it is cut open to prevent additional movement/shrinkage after installation.

H. Install one-way vents every 1,200 sq. ft. to allow relief of vapor pressure, if insulation exists above the roof deck. Cut a hole through the existing membrane and insulation, but not through the deck. The hole should not be larger than the diameter of the venting space. Fill the hole with loose-fill insulation to prevent condensation.

Place the flange of the one-way vent on top of the BUR membrane and fasten to the roof deck with appropriate fasteners or adhere with approved sealant. Immediately seal to a watertight condition with TritoFlex 2K or 1K.

## 3.5 Installation of Liquid Membrane

A. General:

i. Stir materials prior to application in accordance with manufacturer's instructions.

ii. Spray instant-set TritoFlex 2K and Accelerator as a continuous, monolithic membrane of uniform thickness, beginning at the lowest point and terminating at the highest point. Final membrane thickness after full cure must be a minimum, on all surfaces, 97 wet/60 dry mils for 10-year and 15-year warranties and 130 wet/80 dry mils for 20-year warranties.

iii. When a spot repair is required during application, re-spray defect area within 15 minutes of initial spray application so entire membrane cures monolithically.

B. Horizontal and Vertical Application:

i. Spray-apply one continuous layer of TritoFlex 2K Rubber waterproofing membrane, covering all areas of the field and flashings to achieve a cured dry mil membrane thickness of 60 or 80 mils, depending on warranty requirements.

ii. Perform wet mil thickness tests (with a manufacturer supplied mil gauge) at regular intervals while spraying to assure a minimum of 97 wet mils throughout for 60 dry mils, and 130 wet mils for 80 dry mils. Immediately re-spray spots checked with gauge to fill in void.

iii. If necessary, chalk-line or spray-paint a grid across the roof prior to application to gauge product use per drum within a particular section of the roof area. To achieve 60 dry mils, the average rate shall be 800 sq. ft per drum. To achieve 80 mil dry, the average rate shall be 600 sq. ft. per drum. This application rate will vary based on number of seams, penetrations, surface texture and conditions, etc.

| Wet/Dry Mil Thickness | Coverage Rate Per Drum* |
|---|---|
| 97/60 | 800 square feet |
| 130/80 | 600 square feet |

**does not include allowances for surface texture*

iv. If reinforcement fabric is to be used, first apply a thin base layer of TritoFlex 1K (or TritoFlex 2K liquid with no Accelerator) on the surface. Embed 4" or 6" polyester fabric into the wet, coating and use a brush to smooth and saturate the fabric with the coating. Apply more product, if needed, to fully saturate the fabric, but not create any pooling. Immediately apply TritoFlex 2K with the Accelerator on top of the reinforcement to create the final membrane. Please consult with Manufacturer or Designer for details on where reinforcement is required.

v. Refer to manufacturer's recommendations and details for proper membrane terminations.

## 3.6 Installation of 1K B on Flashings, Penetrations, and Transitions

A. Transition Detailing and Flashing, including Pipes, 90-Degree Angles, Gutter Transitions, Penetrations, Curbs, Inside and Outside Corners, Etc.: All flashing details and transition changes shall be prepared as follows:

i. After the TritoFlex 2K membrane is fully dry to the touch with no moisture coming out of the membrane when pressed by hand, all flashing transitions shall receive an additional brush application of TritoFlex 1K B. Additionally, apply TritoFlex 1K B to any visible voids, imperfections, or thin spots in TritoFlex 2K membrane prior to rinsing and applying top coatings. TritoFlex 1K B to be installed by brush or trowel at 97 wet mils to achieve 60 mils dry.

a. Brush apply a 97 wet mil course of TritoFlex 1K B to extend 3" on each side of all curb corner transitions, 90-degree angles, under metal flashings, base and top edge of all pipe penetrations.

b. The field of the roof shall be checked over for imperfections in the TritoFlex 2K spray application and TritoFlex 1K shall be brush-applied wherever needed to reinforce suspected thin spots or spray defects. TritoFlex 1K shall be allowed to cure fully prior to top coating applications. Typical cure time allowance is 24 hours with good weather conditions.

B. Roof Drain Flashing:

i. Check existing drain ring bolts and ensure all are tight. After TritoFlex 2K roof membrane installation is completed on area outside of drain and after proper cure time and rinsing, TritoFlex 1K B shall be applied around inside and outside of the drain ring as well as within the drain bowl to fully seal under the existing membrane to prevent water back-up under the membrane.

a. Apply 97 wet mils to achieve 60 mils dry of TritoFlex 1K over TritoFlex 2K roof membrane, extending from inside of drain to 3" outside of clamping ring.

## 3.7 Installation of Topcoat and Final Check

A. After the TritoFlex 2K and TritoFlex 1K products are fully dry to the touch with no moisture coming out of the material when pressed on with a hand, rinse and wash dried accelerator from all TritoFlex 2K surfaces with clean water until dried accelerator residue is rinsed completely off of the roof. The surface should be completely dry prior to applying top coatings. A pressure washer with a wide tip should be used and care taken to not cause damage to the membrane.

B. Following the application of TritoFlex 2K roof membrane described above, apply the specified reflective, sacrificial topcoat: TritoCryl 2K or TritoCryl 1K. All topcoats are to be installed per Triton's guidelines to achieve a final minimum dry film thickness of 30 wet/20 dry mils for 10-year and 15-year warranties. 20-year warranties require a topcoat applied at 50 wet/30 dry mils.

i. TritoCryl 2K is instant-set and installed in one coat to the thickness required.

ii. TritoCryl 1K topcoat is installed in two coats and the first coat is to be back-rolled when applying by sprayer, to assure full coverage to textured TritoFlex surface.

D. Installation of top coating shall occur after the TritoFlex 2K membrane and TritoFlex 1K B flashings are fully dry, cured, and rinsing of Accelerator has dried. If top coating is performed later than three (3) days after completion of TritoFlex 2K membrane, pressure washing is required to remove dust, dirt, and debris accumulations.

E. In certain climate zones, a reflective topcoat may not be required when approved in writing by Triton Inc. In this event, a thorough rinsing of dried Accelerator should still occur after TritoFlex 2K and TritoFlex 1K are applied and dry.

F. If applying a granulated wear layer, broadcast 40-50 lbs. of roof granules per 100 sf in a 15 wet mil layer of TritoFlex 2K with no Accelerator over the entire surface. The granules must be supplied by Triton Inc. and

approved for use in the specific climate zone and project location.

## 3.8 Field Quality Control

A. Use of specialized equipment such as a mil gauge supplied by the manufacturer to check the liquid membrane thickness during application and a good quality digital camera to provide photos to manufacturer of installation is required.

B. Contractor to provide photographs of areas to receive liquid membrane before start of work, during surface preparation, during spray application, and at completion of work for warranty acceptance.

## 3.9 Clean-Up

A. All debris shall be removed from the premises promptly and the construction area left clean daily.

B. All overspray of products must be cleaned from surfaces not scheduled to receive the waterproofing membrane.

C. At the completion of the contract, Contractor is to remove and dispose of all equipment or temporary facilities related to their contract within 3 days.

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