ROOF PERFORMANCE in SEVERE WEATHER

Polyfresko® G membrane with CURE Technology® is the solution

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ROOFING AND WATERPROOFING SYSTEMS
POLYGLASS
MAPEI GROUP

Weak roofing systems will fail in extreme weather; hailstones will pierce it, rainwater will get beneath it, strong winds will lift it, and extreme heat will expand and shift it.

The performance of a roof is linked to its design. From the manufacturing of the products to the system installation, roof performance depends on the quality of its components.

Before a Polyglass modified bitumen membrane is manufactured, the product goes through rigorous testing to ensure it can withstand virtually every weather condition. Polyglass' modified bitumen membranes are either reinforced with fiberglass to provide dimensional stability or polyester to improve puncture resistance. Membranes that feature patent-pending CURE Technology® incorporate ceramic microspheres, proprietary resins and UV stabilizers to the surface to enhance reflectivity, granule adhesion and stain resistance.

In the event of a severe hailstorm, which can drop grapefruit size hailstones, a Polyglass modified bitumen roof system with CURE Technology can manage the impact of the hail because it is resilient and durable. Building owners and facility managers cannot afford to install any roof system besides a modified bitumen multi-ply roof system.

CONSIDER THE COST OF A COMPROMISED ROOF SYSTEM

The cost of a failed roofing system during a severe weather event can be catastrophic. When calculating their roofing risk, building owners and facility managers should not only look at the cost of roof repairs and replacement, but they should also keep in mind the cost associated with the disruption of business operations and potential loss of inventory. It's critical to consider the big picture and long view when selecting a roof system. Some of the most common types of commercial roof systems are:

Single-ply membranes are factory-manufactured membranes. They generally are categorized as either thermoset (EDPM) or thermoplastic (TPO or PVC). Single-ply membranes are produced using one of three manufacturing processes: calendering, extruding or spread coating. The membranes may contain reinforcement layers. Common reinforcements for single-ply membranes include polyester fabrics or scrims, glass fiber, or a felt or fleece backing.

Built-up Roof (BUR) are commonly referred to as "tar and gravel" roofs and asphalt BUR is the most common type. BUR systems generally are composed of alternating layers of bitumen and reinforcing fabrics that create a finished membrane. It is made up of multiple layers of reinforcing plies and asphalt forming a redundancy of waterproofing layers.

Modified Bitumen Membranes (Mod Bit) are composed of reinforcing fabrics that serve as carriers for the hot polymer-modified bitumen as it is manufactured into a roll material. Mod Bit roof systems are composed of multiple layers and are thicker (up to 300 mils) than single-ply membranes (up to 90 mils). Mod Bit roof systems typically are installed as a multi-ply system, a minimum of two waterproof sheets.

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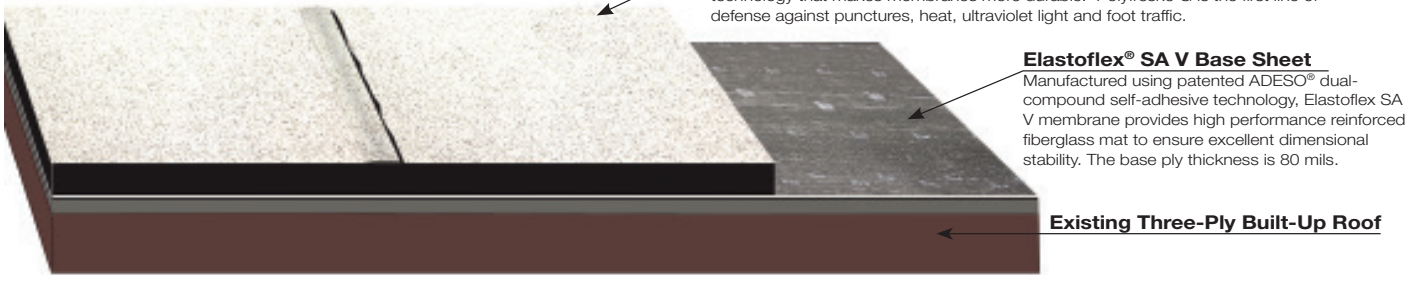
Modified Bitumen Roof System Installed Over Built-Up Roof



Hailstorm produced jagged golf ball size hailstones that fell in Fort Worth, TX, damaging property thoroughout the area.

PHOTO CREDIT: STAR-TELEGRAM

THE 2016 STORM FROM HAIL

In the spring of 2016, severe hailstorms passed through Northern Texas, causing millions of dollars in damages. One of the hailstorms hit Fort Worth,TX. Empire Roofing, a commercial roofer that has installed all roofing types since opening its doors in 1982, was in the middle of a Polyglass roof installation when the storm arrived. Empire began the work to install Polyglass' multi-ply modified bitumen roofing system on a 64,000 square-foot warehouse, a job that would typically take about 10 working days.

Empire Roofing installed Polyglass' Polyfresko® G (highly reflective APP cap sheet) and ElastoFlex® SA V (a self-adhered base sheet) over an existing BUR roof to strengthen the roof system. After two work days and about 25 percent of the job completed, an intense hailstorm with jagged golf ball-sized hail arrived. The National Weather Service formally defines "golf ball" stones as exceeding 1 ¾ inches in diameter. The force behind these stones is equivalent to dropping balls from an airplane flying at 30,000 feet. The stones reach speeds of 120 miles per hour as they fall to the ground. Bad news for everything below – but excellent conditions for a durability test on the membrane. Empire Roofing inspected the roof immediately after the storm. On the portion covered with the Polyfresko G cap sheet, the hail had caused only minor blemishes to the surface. The uncovered BUR portion of the roof had extensive damage as did the BUR roofs on neighboring buildings.

"During the hailstorm, TPO and PVC single plies in the area that were damaged became immediate emergencies for the building owners," said Ronnie McGlothlin, Co-founder of Empire roofing and owner of the warehouse building. "In the case of a modified roof, even if you get damage, it does not immediately allow water into the building."

The behavior of a roof immediately after events like the hailstorm is a significant factor for building owners. In extreme conditions, resilient roofing membranes bend but don't break. However, for single-ply membranes, the first indication of damage too often coincides with the discovery of leaks and water damage.

Polyglass' multi-ply system performed so well, the building owner installed it on the roof of two adjacent warehouse buildings.

POLYGLASS' MULTI-PLY SYSTEM SOLUTION

The inherent depth and redundancy of multi-ply systems supply a number of benefits that cannot be duplicated by single-ply systems. These include:

- greater strength and resistance to punctures, hail, tears, and abrasion
- less vulnerability to performance issues as a result of installation deficiencies in the field
- thicker membranes with additional waterproofing
- excellent resistance to wind uplift
- multiple plies at flashings and critical locations where most leaks occur

Before installing the Polyglass multi-ply system, Empire Roofing power washed the roof to create a smooth substrate. The roof was primed to promote adhesion. Polyglass' Elastoflex® SA V base ply was adhered to the BUR. The Polyfresko® G cap sheet was rolled out and torch applied to the base ply. Alushield, an aluminum foil-face membrane was used to flash the skylights. The foil's embossed pattern resists severe temperature fluctuations and extends the service life of the roof.

The final step involved applying a white elastomeric coating to the seams, where the torching causes bleed out of the black asphalt. The white coating avoids what McGlothlin calls inch-wide "tiger stripes."

The completed 64,000 square-foot roof with polyglass' durable and highly reflective multi-ply roof system.

HIGH-PERFORMANCE MATERIALS FOR DURABILITY

The following Polyglass products were used on the Fort Worth warehouse building.

Polyfresko® G Modified Bitumen is a high performing, white granular APP cap sheet. It is manufactured with Polyglass' patent-pending CURE Technology®, a thin film technology that makes membranes more durable and resilient. Membranes with CURE Technology are highly reflective, UV and stain resistant, and retain granules longer. CURE Technology minimizes discoloration from asphaltic bleed through and surface staining, allowing the membrane to maintain its color and reflectivity.

Reinforced with heavy duty polyester, Polyfresko G provides exceptional strength and puncture resistance. It exceeds the physical properties and performance required for ASTM D6222. With an SRI rating of 96, Polyfresko G can be backed by warranties for up to 20 years when part of an approved multi-ply system.

Elastoflex® SA V membrane is a premium, self-adhered elastomeric base ply roofing product, manufactured using patented ADESO® dual-compound self adhesive technology, whereby a "true" Styrene-Butadiene-Styrene (SBS) modified asphalt compound is applied on the top layer and an aggressive self-adhesive compound is applied on the bottom layer. Elastoflex SA V membrane is built with a high performance reinforced fiberglass mat to ensure excellent dimensional stability.

Elastoflex SA V membrane is finished with sand or polyolefin film with laylines on the top surface and a split release film on the bottom surface.

ALUSHIELD is a prefabricated membrane faced with aluminum foil that is embossed during a continuous calandering process. The embossed pattern on the foil allows the aluminum to expand freely during extensive changes of ambient temperature. The membrane is reinforced with high-strength glass fabric.

For more information on the performance of Polyglass' multi-ply systems, consult the Product Data Sheets at www.polyglass.us and contact your local Polyglass representative.