

Fluid-Applied Roofing:

# **THE SOLUTION FOR A FACILITY'S SERVICE LIFE**



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# Continual renewal of the first line of defense provides the best return on roofing investment.

## What's the mission of a roof?

The answer seems simple enough – to keep water off the occupants' heads. But that is only a narrow view of the roof's *function*. Looked at from the building owner's perspective, you could say that the mission of a roof is to perform its function *for the life of the building*.

When a roof lasts for a building's lifetime, the owner accrues numerous benefits. These include avoiding the enormous

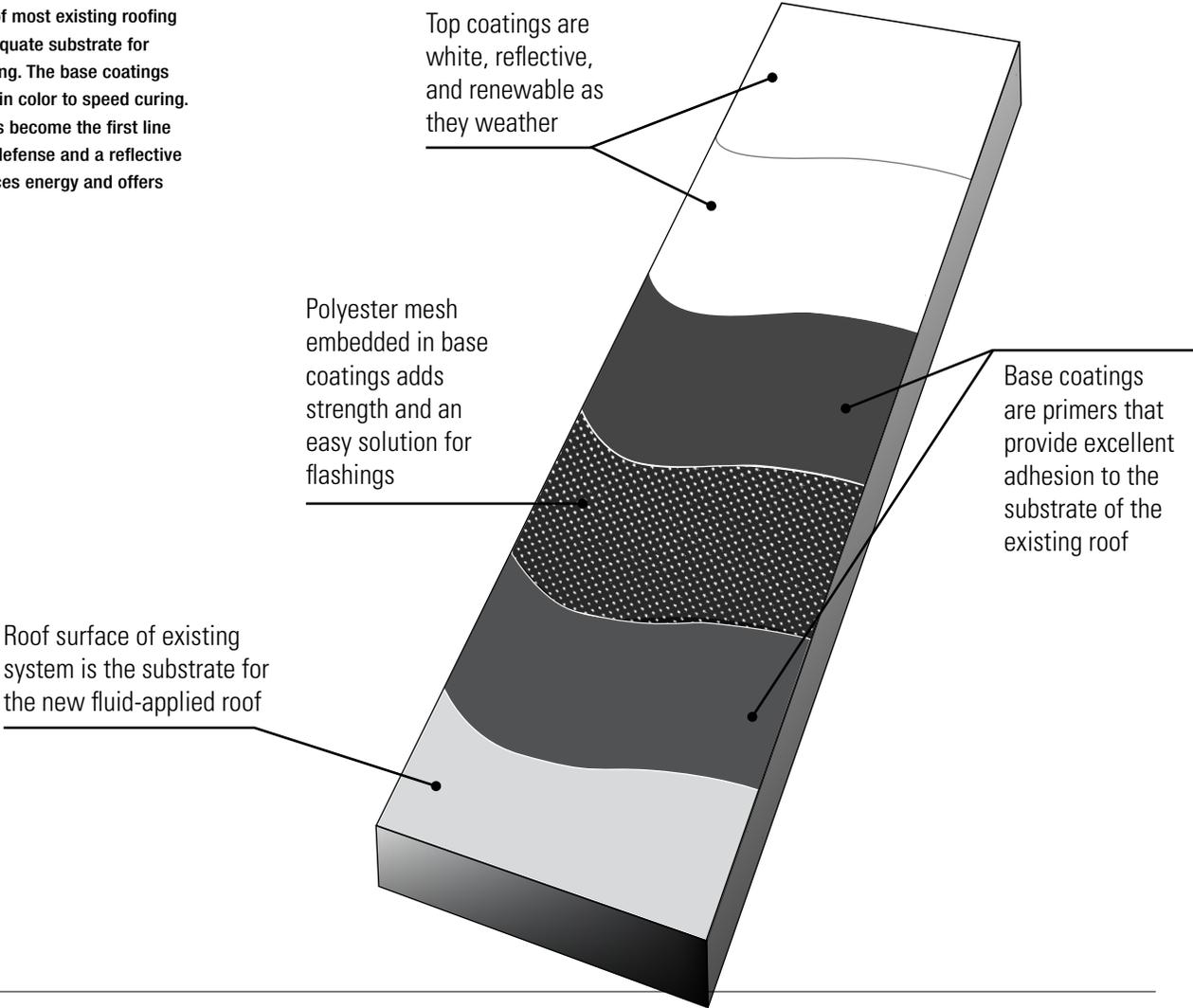
costs and disruption of tear-offs and roof replacement. But to fulfill its mission, a roof needs periodic maintenance and restoration. High-performance roof coatings are a proven method to accomplish the mission over any type of sound existing roof system – including smooth-surfaced or granulated built-up, modified bitumen, spray foam, single plies (TPO and PVC), EPDMs, concrete roof deck, and galvanized metal. The coatings are also applied in the field to new roofs.

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## ROOF SYSTEM COMPONENTS

The roof surface of most existing roofing systems is an adequate substrate for fluid-applied roofing. The base coatings are typically dark in color to speed curing. White top coatings become the first line of waterproofing defense and a reflective surface that reduces energy and offers green benefits.



## The High-Performance Ingredients of Fluid Coatings

Coatings offer inherent material benefits that drive their durability. A key ingredient is *elastomer*, an abbreviation for *elastic polymer*. The molecular structure of this material allows the coatings to be stretched and deformed yet return to their original shape. Embedded in the elastomer are *acrylic* and *silicone polymers* that contribute to

adhesiveness, a white, reflective color and resistance to moisture, temperature changes and chemical attack.

As field-applied and fluid material, coatings provide a seamless, monolithic top layer over the substrate of an underlying roof system. By nature, the coatings are fully adhered and thus provide inherent high resistance to wind uplift, unlike systems requiring ballast or mechanical fasteners. Roof coatings

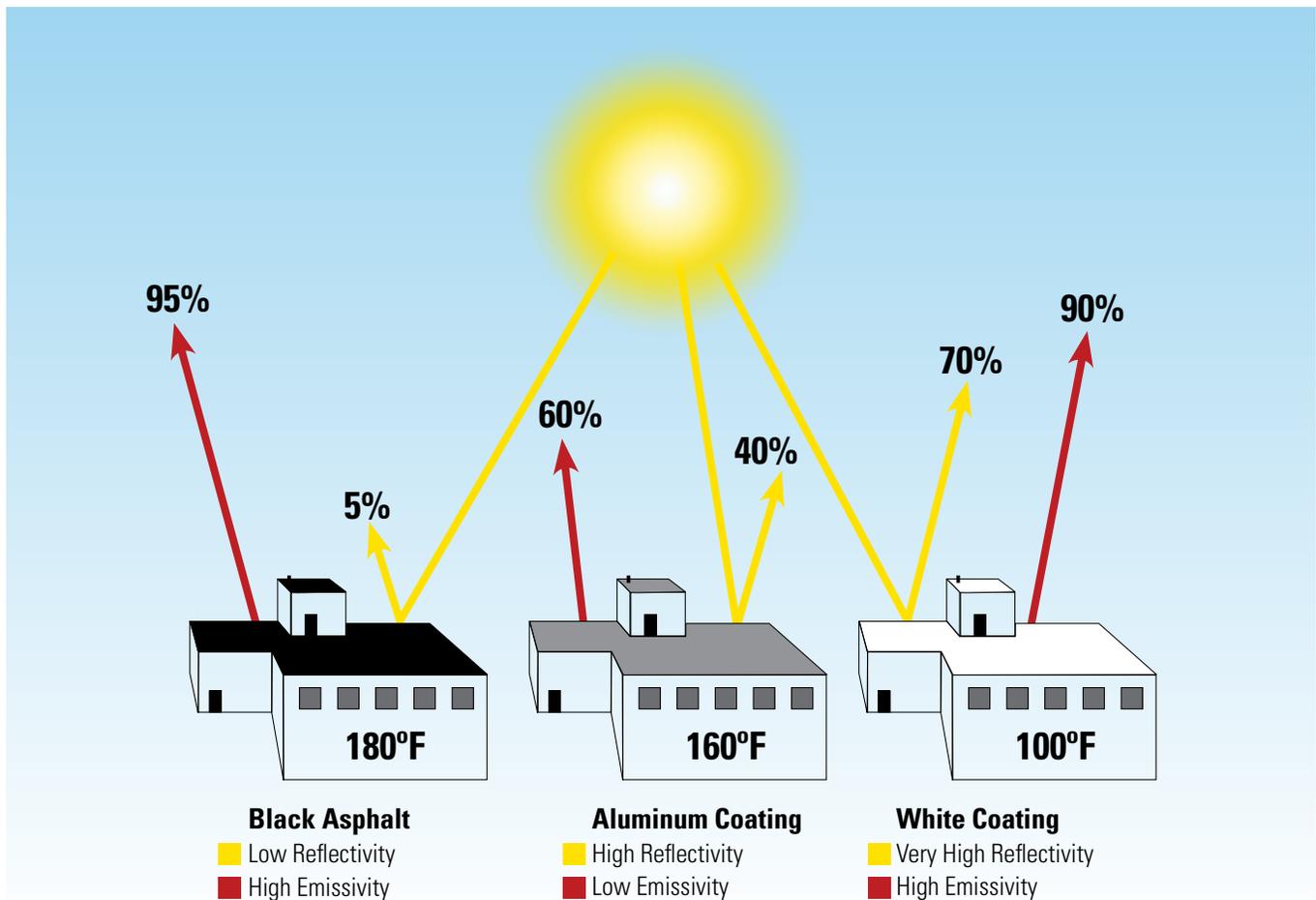
greatly extend the service life of a roof by continually restoring the top layer of the roof, which is the facility's first line of defense against weathering and moisture.

## The Components of Fluid-Applied Roofs

The fluid-applied system typically consists of a **base coating** that acts like a primer and is largely absorbed by the substrate. A second base coating

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## EFFECT OF REFLECTIVITY & EMISSIVITY ON ROOF TEMPERATURE



The cool, white top coating of the fluid-applied system provides the highest values for reflectivity and emissivity, which in turn reduce energy costs, extend service life and increase occupant comfort.

is then applied. While the second base coat is wet, a reinforcing **polyester mesh** is rolled into the coating. The mesh provides strength and stability. If additional strength is needed, multiple layers of mesh can be applied. The base coatings are usually dark in color to accelerate drying and the prompt application of successive coats.

The polyester mesh serves a second purpose – it provides a remarkably simple solution for flashing. A thick application of the base coating is applied to the necessary surfaces. The mesh is

then cut to fit the surface or penetration and embedded in the coating. Additional coatings can be applied until the desired thickness is attained. With this solution, the flashings become an integral part of the monolithic system.

Next the top layer consisting of two final coatings is applied. These coatings are typically white and reflective, offering a number of energy and sustainability benefits (see **A White Roof Means Green Benefits** on page 6). As the top layer wears and weathers, it can be renewed with another coating, restoring

the roof coating to its original condition and thickness.

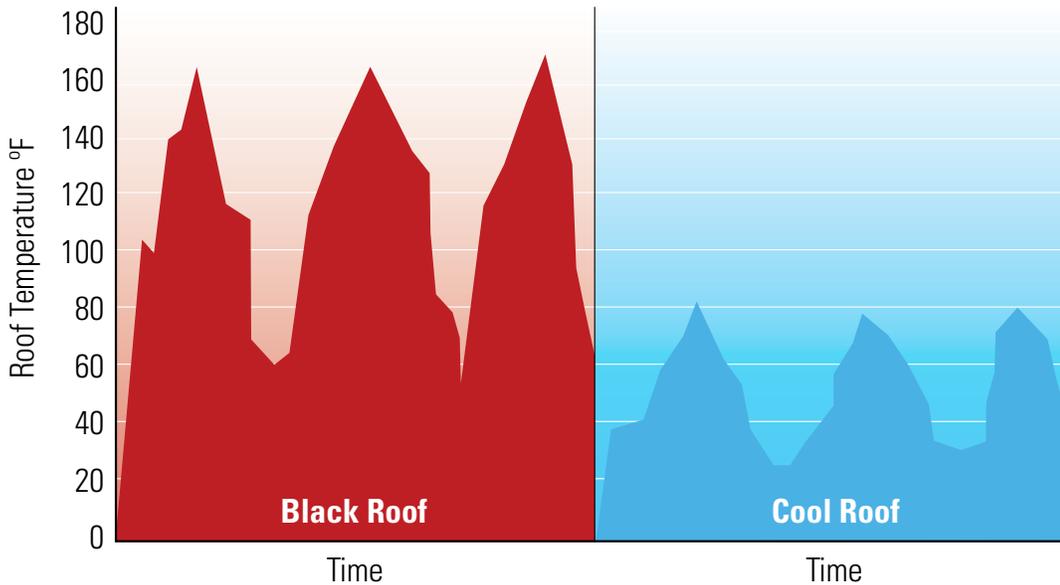
The **cost** of fluid-applied coatings is significantly less than the cost of a new roof. Both the material and labor portions are less. Tear-offs and demolition become unnecessary. As a result, the project cost is typically as little as 25% to 30% of the cost of roof recover or replacement.

Building owners may also enjoy a huge tax benefit because coatings are usually considered a restoration rather

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## THERMAL CYCLE IMPACT ON ROOF SURFACE



The lower temperatures on the surface of a cool roof reduce the intensity of thermal cycling and extend the roof's service life. In addition, cooler surface temperatures reduce smog and pollution while improving the efficiency of rooftop HVAC equipment.

**COATINGS CREATE A RENEWABLE FIRST LINE OF DEFENSE OVER MOST EXISTING SYSTEMS**

The following projects illustrate how coatings can be applied over a range of existing roof systems.



A built-up system on this office building in Milton, WA, was renewed at minimal cost with fluid-applied roofing.



In Phoenix, KM coatings restored this weathered metal roof.



Fluid-applied coatings extended the life of this foam-over-metal roof in Peoria, AZ.



A cool coating was adhered to this TPO single-ply system in Las Vegas.



A foam roof in Phoenix was restored with KM coatings.

than a new capital project, and thus the expense is 100% amortized in the current fiscal year rather than over the lifetime of the fluid coating.

### **A White Roof Means Green Benefits**

Fluid-applied roofing can extend the service life of a roof indefinitely, and in

so doing, offer a number of sustainability benefits.

The coatings are typically bright white in color, which produces both very high reflectivity and high emissivity. The reflective property bounces light and heat off the roof, while emissivity returns heat to the atmosphere by radiation,

thus reducing the heat absorbed by the building. These two properties characterize the cool roof and its ability to reduce energy costs and improve occupant comfort.

Cool roofs also reduce the urban heat island effect and contribute to LEED

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## Steps to Fluid-Applied Success

**T**he Scottsdale (Arizona) Performing Arts Center houses a theatre and museum. The facility cannot be shut down for any reason, so it was a major concern when a deteriorating roof seemed to call for a disruptive reroofing project.

The center's original 56,000-square-foot roof was 25 years old. It consisted of lightweight concrete deck covered by an asphalt built-up roof with a base ply, an intermediate ply, and a granule surface cap sheet. The roof was badly wrinkled with numerous splits in the side laps. Many spot repairs had been made over recent years but these were in poor condition, particularly along edge details and on the roof field.

As a public gathering place, the facility needed a roof solution that was odor-free. Debris and noise also had to be kept to a minimum.

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The roof at the Scottsdale Performing Arts Center was in very poor condition (top). Although spot repairs had been made, these, too, were in poor condition. After a thorough inspection and moisture survey, the roof consultant specified a KM fluid-applied system. The seamless, mesh-reinforced roof (middle, bottom) saves energy and can be recoated as the top surface weathers.



## STEPS TO FLUID-APPLIED SUCCESS *(continued)*

To develop the best possible solution, Western Roof Evaluation Corporation (WRECORP) conducted a thorough inspection, including a nondestructive capacitance moisture scan of the roof to identify wet areas. The entire area beneath the roof surface was mapped out to identify areas requiring special attention. WRECORP also took more than 20 core samples to confirm the composition and condition.

Based on the field survey and inspection, the firm recommended a fluid-applied roofing system from KM Coatings as the preferred roof recover option. The KM SHIELDCOAT System completely met these criteria. This fluid-applied roofing system was the best recover option for this project as it eliminated the need for a tear-off.

The center's facility manager at the Scottsdale Performing Arts Center retained Architectural Resource

Team, Inc. to create a CSI-formatted specification for the project. This KM SHIELDCOAT fluid-applied system had been successfully used for over 10 years on numerous projects throughout the southwest U.S. The KM Coatings product provides excellent adhesion, dirt-pickup resistance and low-temperature flexibility. Its long-term performance history has been excellent, especially in areas where intense UV solar radiation typically leads to premature roof membrane degradation.

The roofing contractor, Progressive Roofing, was well trained in installation of the KM SHIELDCOAT System and knowledgeable about fluid-applied systems. One-way vents were installed to dry out the failed roof quickly and expedite the recover process. The contractor determined that a crew of only 6 was needed for the project. The project did not require shutting down the building or its HVAC system because all fluid components were low odor or odor-free.

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requirements and ENERGY STAR scores. They may qualify for federal and/or state tax credits.

The cool properties of the roof coatings are important factors in their longevity and low maintenance. Because heat and UV light are the enemies of long life, the cooler temperatures minimize the intensity of thermal cycling. Cooler temperatures also improve the efficiency of rooftop HVAC equipment and reduce smog and pollution. By extending service life, the cool coatings minimize roofing waste, which accounts for 7-10% of U.S. landfills. Installation of cold-applied coatings is also more environmentally friendly than hot-applied roofing and steaming kettles.

The thickness of a fluid-applied roof – which can add 20 or 30 millimeters of material, depending on the number of coatings – adds considerable heft

to an existing roof that has begun to weather. If, for example, 20 millimeters are added to a single-ply membrane that originally was 60 millimeters, the primary waterproofing membrane's thickness would be increased by 30%. As the new top layer weathers, it acts like a sacrificial surface that can be renewed by recoating.

However, recoatings are few and far between. Warranties are available for as long as 20 years (see box on page 8 with warranty information). The cost of recoating is usually less than that of the initial application.

### **Ensuring a Successful Project**

A thorough inspection of the existing roof system is critical for specifying and applying a new fluid-applied roof. Any leaks and ponding should be repaired and a moisture survey completed if there

is any doubt. Any wet – or previously wet – insulation should be replaced as its thermal value will likely have been compromised. Compromise makes a good umbrella but a bad roof.

To ensure that the new coating will not peel from the underlying membrane, an adhesive test can be done. In this simple test, a coating is applied to the substrate followed by a strip of polyester. Once the coating has cured, the polyester strip is pulled to determine how many pounds of pressure are required for delamination. With good adhesion and a good substrate in place, owners can be confident of successful outcome.

The time to restore the roof with fluid-applied coatings is when the sun is shining, not when it's raining. The goal is not simply to avoid leaks but to have a sound, economical roof for the life of your building.

## KM WARRANTY OPTIONS

Warranty periods range from 5-20 years.  
Two warranty types are available from KM:

- Manufacturer's Material Warranty
- System Warranty (Labor and Material)

The **10+10 warranty** provides a renewable option. The initial term covers 10 years. After year 9, a professional roof inspection is done and any necessary cleaning and maintenance are completed at the owner's expense. Based on the inspection, a specified number of new coatings is then applied and a new 10-year warranty issued.

The warranties are available through contractors who have obtained certification as a KM Coatings Approved Applicator. Successful long-term performance requires proper preparation and leak repair as well as selection of the proper primer and coating.

## FEATURED KM PRODUCTS

KM has a family of fluid-applied roofing products designed for a range of substrates and situations. Below is a sampling of the products and their specialized uses.

### **FINALCOAT**

This topcoat can be applied over new or existing granule roofs. It also offers excellent adhesion over PVC single-ply membranes and is an outstanding choice for smooth and metal roofs.

### **XTREME FINALCOAT**

This high-solids, acrylic-based topcoat can be used over most substrates. Due to its high solids content, the product results in fast buildup of the waterproof membrane as measured in millimeters. Warranty protection extends 15 to 20 years.

### **FINALGUARD**

This versatile product can be used over single-ply substrates, including TPO and EPDM. It can also be used as a basecoat over new poly spray foam surfaces and metal roofs.

### **URE-FLEX**

This hybrid urethane acrylic coating creates a rubber-like shield capable of expanding more than 300%. It resists extreme ponding and can be used to waterproof parapet walls and other vertical surfaces.



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and materials tested under ASTM D-6083 methods.

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