

GAF Liquid-Applied Roof Membrane Brochure

(COMCO101)

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*Quality You Can Trust...From
North America's Largest Roofing Manufacturer!™*

gaf.com



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LIQUID-APPLIED ROOF MEMBRANE

gaf.com

GET THE LONGEVITY YOU DESERVE

OUT OF YOUR LOW-SLOPE ROOFING SYSTEM

More than "just" coatings, GAF manufactures robust roofing systems that effectively seal, providing a watertight roofing solution. GAF offers a complete array of solutions to preserve and protect both new and existing structures.

ABOUT THIS GUIDE

This brochure discusses:

- The Definition of Liquid-Applied Roof Systems
- Why Liquid-Applied is the Best "Cool Roof"
- How Liquid-Applied is Being Utilized
- The Advantages of Choosing GAF



TESTED TECHNOLOGY

Roofing has been a critical component of construction throughout history. In recent decades, advances in technology have created solutions that last longer, cost less, withstand harsh elements, and generate less environmental waste. Liquid-applied roofing systems from GAF provide a reliable roof system that will give you the longevity you deserve and meet your 21st century needs.

RELIABLE MANUFACTURER

GAF is a leading manufacturer of protective systems and coatings for the construction industry, with 24 locations across the United States. Our Technical Sales Representatives are positioned throughout North American markets to provide guidance, support, and training to the industry.



TESTED. PROVEN. TRUSTED.

Building owners, architects, specifiers, contractors, consultants, and property management professionals trust our solutions to protect, preserve, restore, repair, and beautify the building envelope and surrounding surfaces.



TRUSTED BRANDS

GAF has provided roof systems, coating solutions, and pavement coatings that meet the most rigorous industry standards.

Our established brands such as United Coatings, HydroStop, and StreetBond are staples of the roofing and pavement coating industries.



PROVEN HISTORY

For over a century, GAF brands have protected and preserved hundreds of millions of square feet of industrial, commercial, and architectural surfaces worldwide. We supply superior roofing system solutions to the construction industry.

GAF confidently stands behind its roofing systems by means of comprehensive limited warranties.

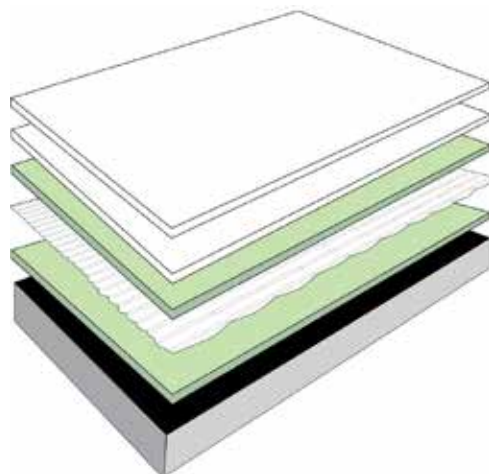
Liquid-Applied Roofing

FULLY ADHERED SYSTEM



THE LONGEVITY YOU DESERVE

One of the most critical components of any structure is the roof. It functions as a shield from harsh external elements. Liquid-applied roofing systems are constructed from multiple components working together to preserve the integrity of your building by providing protection from wind, rain, snow, ice, and heat. Once installed and properly maintained, GAF's liquid-applied roofing systems provide a dependable solution with no more tear-offs. These are customized membranes that are built on-site and can be installed over various existing substrates.



COMPONENTS

A liquid-applied roofing system is comprised of multiple components that come together to form a fully adhered, seamless, and self-flashing membrane. Each integral part is carefully engineered to perform under adverse conditions and be fully compatible with the other components of the system. Components may include liquid-applied coatings and mesh membranes, or any combination thereof. A true system preserves and protects the integrity of the building.

VERSATILITY

GAF offers multiple liquid-applied roofing system solutions, each designed for specific applications and conditions. These solutions each feature a liquid-applied component that creates a seamless, chemically resistant barrier to external elements. They can be installed over most existing roof types, eliminating the need for tear-offs or installation of re-cover boards. No hot kettles, no expensive installation equipment, and no special seaming devices are required. Once installed, periodic maintenance coatings (along with a regular schedule of cleaning) will preserve the roof with no additional steps needed.

PERFORMANCE

Roof systems are critical to the integrity of any structure. Once properly installed, a liquid-applied roof membrane can withstand extreme elements and stresses encountered with typical building movement. The chemical composition withstands the extreme heat of the sun’s UV rays, helping to extend the life of the roof.

THIRD PARTY ENDORSEMENTS

GAF ISO 9001-certified roof systems are held to the same standards and requirements as conventional roof materials such as TPO and modified bitumen. Compared to traditional roof coatings, roof systems are held to a much higher standard.

Testing organizations, including Underwriters Laboratories, Factory Mutual, and Miami-Dade County, test roof systems for their ability to protect a building and its occupants from external elements.



WHAT MAKES A SYSTEM?

- Multiple components that create a seamless and self-flashing membrane
- Tested and approved as a singular, integrated system
- Warranties that provide security and peace of mind

TESTING ENDORSED

Liquid-applied roof systems are built on-site, forming a fully adhered, seamless membrane that meets the requirements of FM4470 testing, which includes resistance to hail, foot traffic, wind uplift, and most importantly, water leakage.

RESISTANCE TO WEATHERING

Note: Resistance to weathering and retention of physical properties is a key performance attribute of any roof system. Data was obtained on a premium acrylic liquid-applied roofing system consisting of fabric-reinforced foundation coats overcoated with two topcoats for a total system thickness of 40 mils dry. Data shows that even after 8,000 hours of Xenon Arc accelerated weathering (per ATSM D2370), this system is able to retain virtually all of its initial elongation and breaking strength after weathering.

Tensile Properties	Initial	2000h	4500h	8000h
5 specimens; 3.0" lng x 0.5" wide Test Speed 1.0±0.2"/min Test Condition 73.4±3.6°F & 50±10%RH				
MD - Percent Elongation (max load) (%)	44	45	50	36
MD - Breaking Strength (lbf/in-width)	70	70	64	65
CMD - Percent Elongation (max load) (%)	42	48	53	41
CMD - Breaking Strength (lbf/in-width)	65	73	71	69

Get The Longevity You Deserve

TRUE LONGEVITY

- No complicated or expensive maintenance procedures
- Nothing to tear off, reducing environmental waste and associated costs
- Ownership costs much less than comparable roof systems



COST EFFECTIVE

In any roofing project, there are several cost factors to consider: materials, installation, maintenance, longevity, and energy usage are just a few. Liquid-applied roof systems keep costs to a minimum with simple installation and by requiring no expensive installation equipment. By using a liquid-applied system, no tear-offs are required — resulting in substantial cost savings compared to traditional roof systems.

Preserving the integrity of a liquid-applied membrane is as easy as periodic maintenance. Along with recommended annual cleaning, once every ten years (on average) additional coats of the liquid-applied roof system are applied.

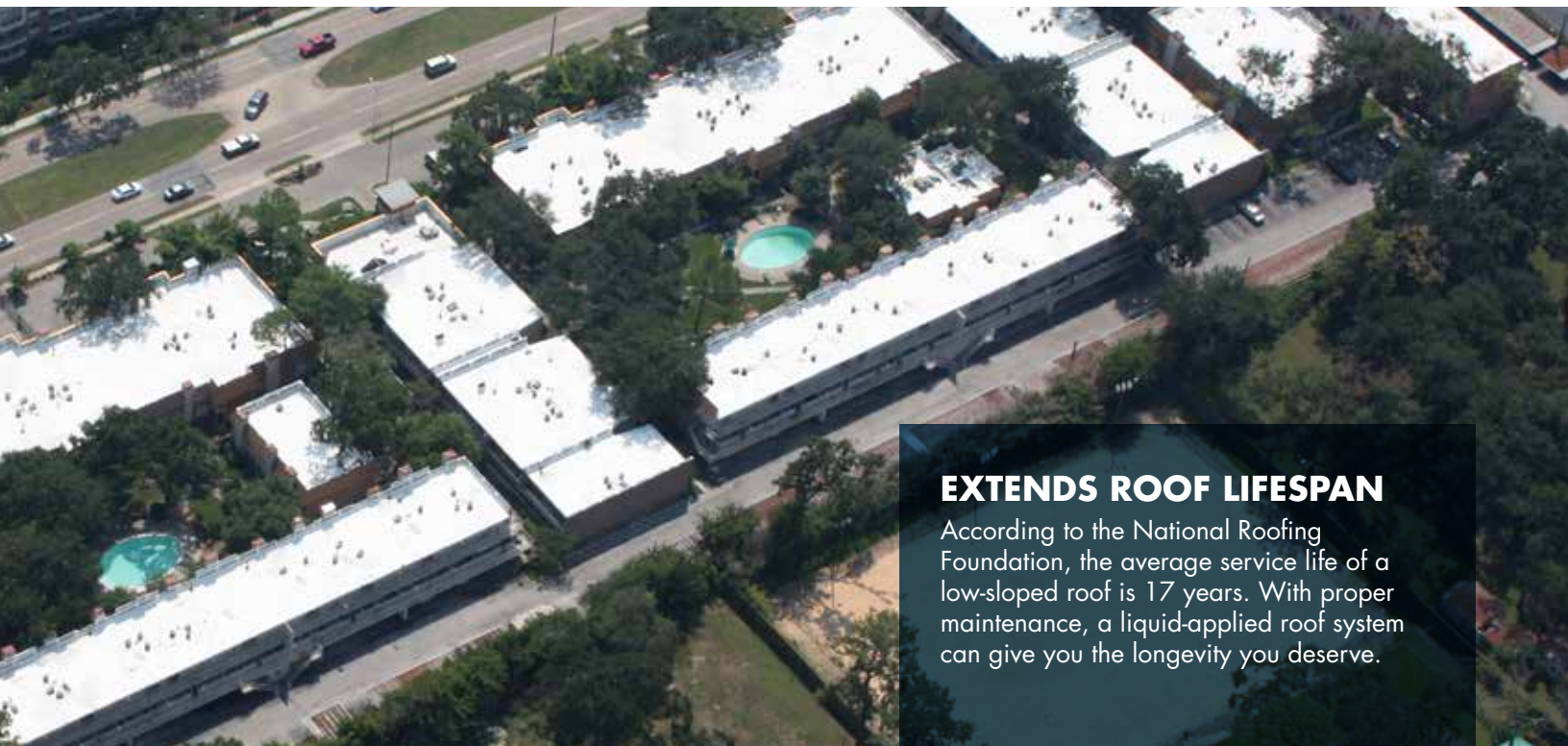
COMPETITIVE COMPARISON

There are many factors to consider when selecting a roofing system. Whether your primary concern is maintenance requirements, occupant satisfaction and safety, or aesthetics, liquid-applied roofing is the solution that addresses all of your needs.

	TPO/ PVC	Mod Bit	EPDM	Metal	Liquid- Applied
ENERGY STAR® Qualified (U.S. only)	✓	✗	✗	✓	✓
Seamless	✗	✗	✗	✗	✓
Inexpensive Installation Equipment	✗	✗	✗	✗	✓
Internally Plasticized	✗	✗	✗	✗	✓
Less Landfill Waste	✗	✗	✗	✓	✓
Fully Adhered	✓	✓	✓	✗	✓

**WANT TO SEE THE DIFFERENCE
A SYSTEM CAN MAKE?**

See projects on page 11



EXTENDS ROOF LIFESPAN

According to the National Roofing Foundation, the average service life of a low-sloped roof is 17 years. With proper maintenance, a liquid-applied roof system can give you the longevity you deserve.

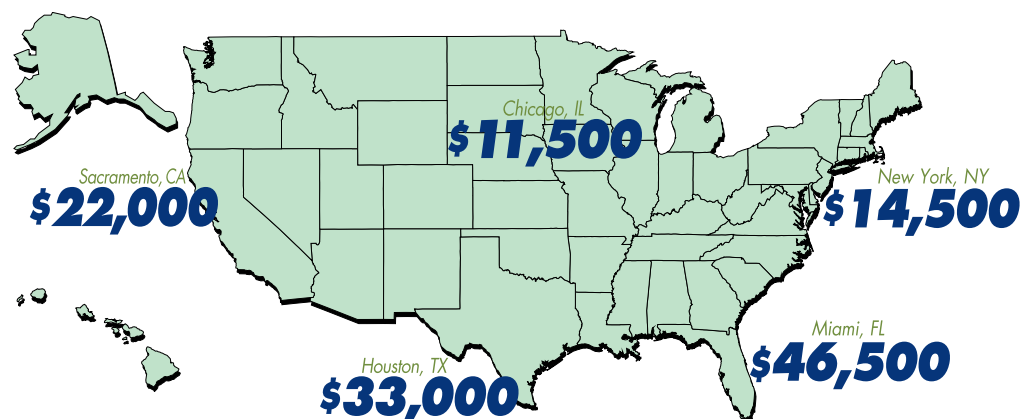
SAVE ENERGY & SAVE MONEY

On a sunny, summer day, a black roof can reach temperatures in excess of 170°F! On the same day, the highly reflective white surface of a liquid-applied roofing system can be as low as 110°F! As a result, much less solar radiation is transmitted through the roof and into the facility. With energy prices on the rise, why get saddled with an energy-wasting black roof when you can install an energy-efficient solution instead?

The magnitude of cost savings from a white roof can be staggering. The U.S. Department of Energy's Oak Ridge National Laboratory provides a convenient method for estimating the cost savings of a white roof. Depending on your location, an energy-saving coating could offset 30% or more of the original cost to install the product!

Estimated Energy Savings Of A 50,000 ft² Liquid-Applied Roof Over 10 Years*

(Based on Data From Oak Ridge National Labs, U.S. Dept. Of Energy)



To calculate the savings in other cities, visit the ENERGY STAR® website at: www.ornl.gov/sci/roofs+walls/facts/CoolCalcEnergy.htm

*Energy savings estimates are based on energy and fuel cost data provided by ORNL website at the time of print and does not take into consideration energy cost fluctuations over time. Assumptions used in the savings calculations include: R-value of 19; infrared emittance of 89; COP of 2; in total solar reflectance of 81%; average heating system and A/C system efficiency. The results are examples - age of building, geographical locations, and your exact energy/fuel costs as well as other factors will affect your specific situation.

Energy Savings Analysis

ENERGY EFFICIENT

- Lower overall cost of ownership including maintenance, energy consumption, and insulation
- Conserve energy by reflecting heat from the building
- Qualify for LEED® points and federal and state tax credits
- Maintain long-lasting color and reflectivity



LOWER COST OF OWNERSHIP

The cost of installation and maintenance are just two pieces to consider in a roof cost analysis and comparison. The type of roof installed impacts the building's energy consumption, repair costs, and the service life of HVAC equipment. All GAF commercial roof systems are available in colors that have been designated as "cool roofs" by the Cool Roof Rating Council. This designation ensures maximum energy efficiency and reduces cost of ownership related to power consumption, HVAC maintenance, and insulation requirements. The building also may qualify for state and federal tax rebates as well as LEED® points for sustainability and reflectivity.



ENERGY SAVINGS

In addition to the cost savings associated with no expensive, disruptive tear-offs over the life of a building, GAF liquid-applied roof systems offer energy cost reductions. Let's examine a real-life example of a reroof that resulted in significant cost reductions. Chart A below presents the details of the facility.

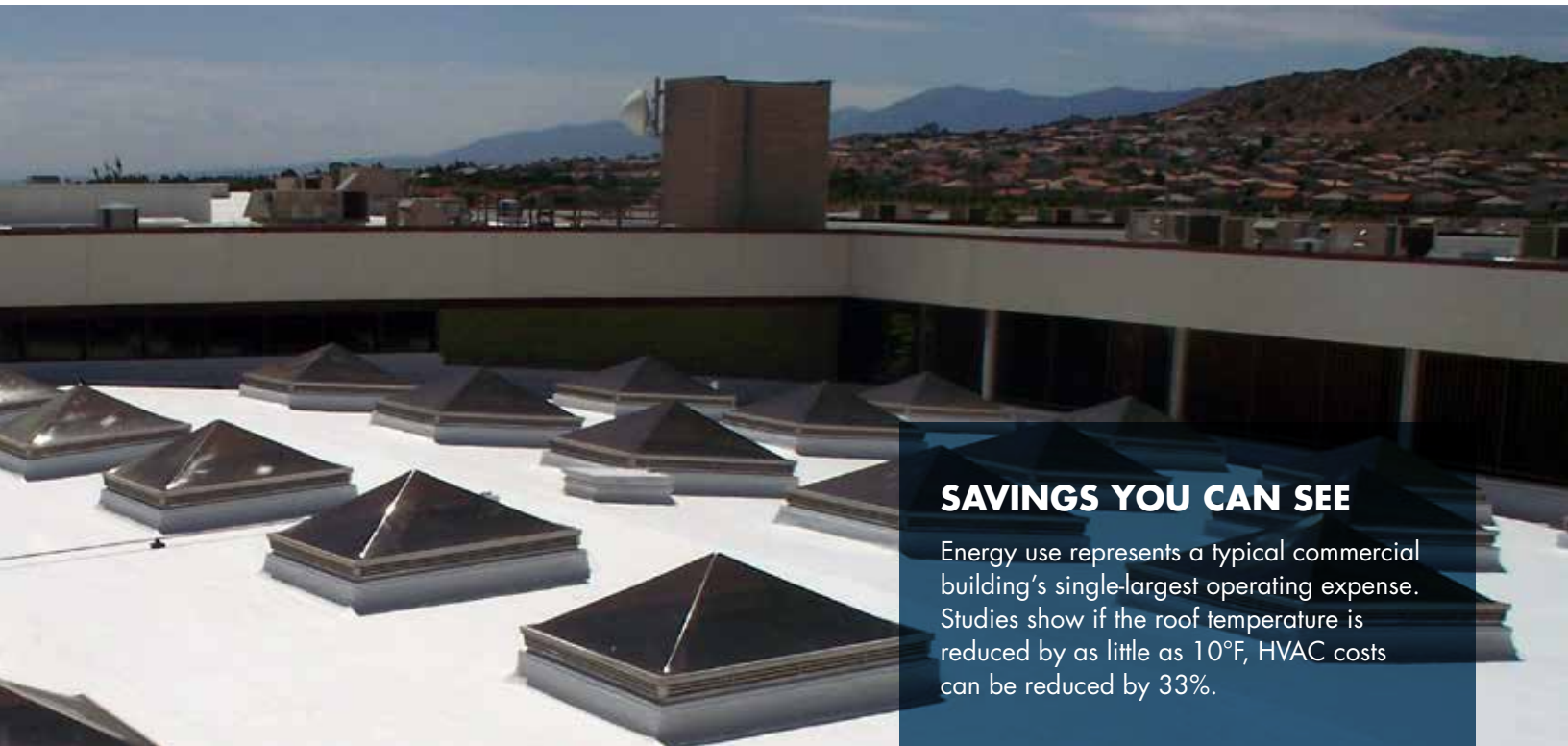
Chart A Cost Savings Example

Building Size	HVAC	Existing Roof System	New Roof System
56,000 ft²	Electric Cooling Natural Gas Heat	Modified Bitumen	PremiumCoat® Liquid-Applied

Note: This analysis factors in the costs to heat and cool the facility. For reference, the cooling system efficiency in this model is 8 S.E.E.R., and the natural gas heating system efficiency is 70%. The building used in this example is located in Texas.

When comparing the existing and new roof systems in Chart B, the estimated energy costs are presented over 12 months. Fuel cost, interior temperature, climate, roof surface type and color, and the amount of insulation utilized are included in the energy cost formulas.

Energy savings associated with the liquid-applied roof systems resulted in an estimated 29.26% reduction in carbon footprint.



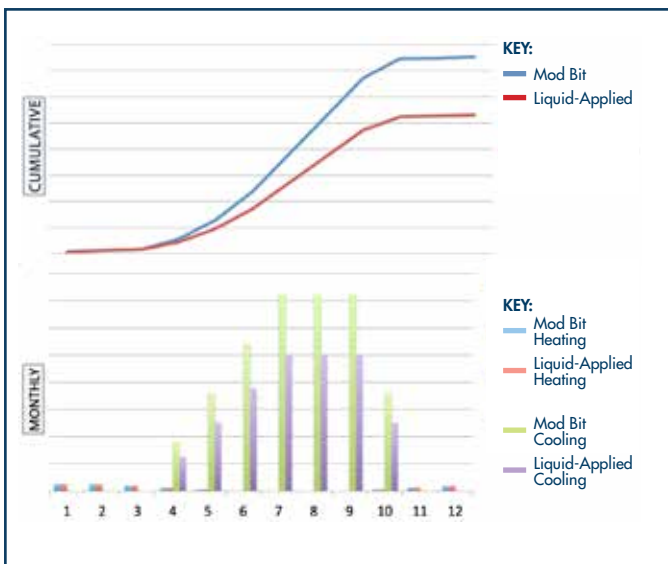
SAVINGS YOU CAN SEE

Energy use represents a typical commercial building's single-largest operating expense. Studies show if the roof temperature is reduced by as little as 10°F, HVAC costs can be reduced by 33%.

ENVIRONMENTAL IMPACT

Roofing tear-offs result in millions of tons of waste being placed in landfills each year. By choosing to install a GAF liquid-applied roof system over an existing traditional system, the need for a tear-off is eliminated and significantly less waste is created.

Chart B Annual Energy Costs Comparison



Note: This energy savings model is based on the LC4 Life Cycle Cost analysis tool developed by Pat Downey of the Merik Professional Roofing Services in the late 1990s. The LC4 energy calculations and formulas are taken from the 1989 ASHRAE Fundamentals Handbook. Other materials were considered; contact GAF for a detailed list of references utilized for this analysis.

Further, the 29.49% energy usage reduction detailed in Chart B (left) results in lowered environmental emissions. In addition to the cost savings associated with the increased efficiency, the reduction in fuel results in less emission of harmful gases.

Chart C Environmental Emission Comparison

Gas Emitted	Modified Bitumen	Liquid-Applied
CO ₂ (Carbon Dioxide)	496.78 tons	356.39 tons
CH ₄ (Methane)	10.72 lb	7.69 lb
N ₂ O (Nitrous Oxide)	12.87 lb	9.23 lb

Note: Chart C compares the emissions created when supplying energy for heating and cooling the facility.

The impact of such savings is very clear. The reduction results in the equivalent of 562 trees being planted! It is as if a plane flew 214,851 fewer miles or 28 fewer cars were on the road.

Chart D Environmental Impact of Energy Savings

Trees Planted	562
Fewer Airplane Miles	214,851
Fewer Cars on Road	28

More Than "Just" A Coating

FULLY ADHERED SYSTEM



HYDROSTOP™ PREMIUMCOAT® SYSTEM

GAF offers the HydroStop™ PremiumCoat® System, a fabric-reinforced acrylic elastomer system. A Class 1, FM 4470-approved roofing system like HydroStop™ PremiumCoat® System functions both as a stand-alone roof system and as a re-cover system over a variety of substrates. It is made using the highest-quality raw materials and forms a flexible, UV-resistant compound. Each liquid-applied membrane is fully reinforced with a tough nonwoven polyester fabric, designed for roofing and flashing applications of all types. It is internally plasticized and meets ASTM D6083 for items such as flexibility, mechanical properties, and adhesion.



COLOR THAT LASTS

In order to be designated as a "cool roof", the color of the roof must reflect a certain amount of sunlight and must sustain lower temperatures than other roof colors. However, if the color fades or discolors over time, the reflective properties may decrease, reducing the energy reduction capabilities of the roof and increasing associated costs.

GAF liquid-applied roof systems are engineered to hold their color over time, maintaining their reflectivity and "cool roof" status. Along with regular cleaning and periodic maintenance, GAF liquid-applied roof systems not only last but also continue to positively, predictably impact the cost of ownership long term.

FIRST LEED® GOLD SCHOOL IN TEXAS



Gloria Marshall Elementary is a unique school for Spring Independent School District (ISD) in Spring, TX. It is the first LEED® Gold-certified school project to be constructed in Texas. The school has photovoltaic cells on the rooftop to generate electricity, uses geothermal heating and cooling, and is designed to harvest natural daylight to illuminate the classrooms. It also uses collected rainwater to flush toilets

and has an on-site wind turbine, furniture built from trees originally located on the building site, and a highly reflective GAF roofing system to top it all off.

The GAF liquid-applied system complied with the LEED® Gold certification qualifications, including zero-waste construction. The water-based elastomeric acrylic coating comes in recyclable containers. The rolls of fabric reinforcement are packaged around cardboard tubes, also 100% recyclable. Since the components of the GAF system are water based, the finished product poses no threat to the school's rainwater collection efforts. The rainwater captured on top of the roof is filtered off and used by the school as greywater to flush toilets.



Photo courtesy of Luis Ayala, SHW Group



PROJECT PROFILE

FEDERAL COURTHOUSE – Albuquerque, New Mexico

CHALLENGE Due to budgetary restrictions, the U.S. General Services Administration (GSA) could not afford to remove the existing roof and replace it with an entirely new one. The existing roof had been consistently leaking, disrupting the work of the judges and other occupants of the building.

SOLUTION The pitch pans and roof drains on the existing modified bitumen roof were repaired properly, and then a fabric-reinforced elastomeric acrylic roof system was installed. The liquid-applied nature of the solution allowed the roof, details, and base flashings to all form one seamless membrane and create a leak-free barrier.

RESULTS Because the project came in so far under the original reduced budget, the GSA was able to use GAF roofing systems to reroof several additional roof sections as a change order and still remain within budget. Even with the secure nature of the building and the permissions required just to gain entry, a small crew was able to complete the roofing project within the expected timeline.

Coating Solutions For Walls

ABOVE GRADE, TINTED



HYDROSTOP™ FLEXCOAT WALL COATING

HydroStop™ FlexCoat Wall Coating is a flexible elastomeric that fills cracks and provides a smooth, opaque, watertight barrier for both painted and unpainted masonry surfaces. As masonry and stucco surfaces are primary points of entry for water, HydroStop™ FlexCoat Wall Coating is carefully formulated to remain flexible and allow for movement while providing high-quality water resistance.

CRACK BRIDGING

HydroStop™ FlexCoat Wall Coating is a “crack bridging” elastomeric coating designed specifically for exterior walls. It is formulated with the highest-quality resins and raw materials to ensure a tough yet flexible mildew-resistant coating.

COLOR OPTIONS

An extensive color palette can be selected, and HydroStop™ FlexCoat Wall Coating is UV resistant to maintain colorfastness for many years. It keeps the water out while allowing the option of hundreds of colors to match the design of the project.

Before



After



PROJECT PROFILE

BREWERY – Asheville, North Carolina

CHALLENGE A uniquely shaped structure with art deco accents, the building was once a hardware store that has most recently been transformed into a creative craft beer brewery and brewpub. The owners needed a versatile product that could not only waterproof the existing hard coat stucco but also successfully unite the new construction and the existing structure under a solid coat of color.

SOLUTION The flexible crack-bridging nature of HydroStop™ FlexCoat Wall Coating was essential in transforming the building's exterior walls. Broken or missing pieces of the stylized horizontal banding were re-created and tied in to the existing wall accents. Repairs were also made to the stucco walls. After three coats of HydroStop™ FlexCoat Wall Coating, the renovated portions blended in seamlessly, the walls were one continuous color, and, most importantly, the building was protected from damaging water intrusion.

HYDROSTOP™ CLEARGUARD PLUS® WALL COATING

HydroStop™ ClearGuard Plus® Wall Coating is a state-of-the-art water repellent formulation that provides a durable, clear protective barrier against water, oil, and dirt. It does not have a sheen, which allows the wall surface to have a consistent appearance.

SUBSTRATE FRIENDLY

HydroStop™ ClearGuard Plus® Wall Coating combines the best of siloxane and fluorochemical technology to protect all types of unpainted masonry, brick, unglazed tile, grout, terra cotta, and stone. It provides oil and water repellency, stain resistance, and substrate breathability, making surfaces easier to clean.

INSTALLER FRIENDLY

Solvent free and emitting no harmful fumes or odors, this water-based coating is safer to work with and requires no special equipment to apply.



ABOVE GRADE, CLEAR



HYDROSTOP™ BARRIERGUARD® WATERPROOFING

HydroStop™ BarrierGuard® Waterproofing is designed for all types of masonry surfaces such as foundation walls, concrete panels, retaining walls, and moisture-retaining structures such as gutters, cisterns, and concrete shrubbery boxes.

SIMPLICITY

Mixed with water and Portland cement and fully reinforced with HydroStop™ PremiumCoat® Fabric, the application forms a hardwearing, flexible compound.

NONTOXIC AND RELIABLE

HydroStop™ BarrierGuard® Waterproofing meets VOC emissions and regulations to eliminate facility downtime during installation. Its NSF 61 approval makes it a perfect solution for cisterns and potable water tanks.

BELOW GRADE

Field Support

As part of our commitment to top-quality products, GAF supports the ongoing training and continuing education needs of the market. We have all the resources needed to help customers select and specify best-in-class applications for design plans and construction projects.

SEMINARS & PRODUCT DEMONSTRATIONS

GAF's informative seminars and product demonstrations, held throughout the year, are offered in local, regional, and national formats to educate and train on the proper application and installation of our roofing systems, coatings solutions, and pavement coatings. Seminars provide attendees with a keen understanding of how to successfully promote and install the GAF family of products.

Sample topics and information covered include: proper application techniques, precision job material estimation and tear-offs, how to increase your productivity and decrease job material waste, and learning how to increase profitability using GAF solutions.

GAF also sponsors customized product demonstration events that feature individual products from our roofing systems, coating solutions, and pavement coatings family of products. Demonstrations are focused on proper product application and installation, aesthetic design, job site productivity, material estimation, and tear-offs.



AIA/CONTINUING EDUCATION

GAF provides Learning Unit hours (LUs) through the American Institute of Architects CES Program by offering "Lunch and Learns," as well as product demonstration sessions. Learning Units can be earned either in-office, hosted by a GAF Technical Sales Representative, or online.

NETWORK OF PROFESSIONALS

GAF takes great pride in providing unmatched technical support. Our Technical team is committed to helping customers find the right solution for their next project. Strategically located in the markets they serve, Technical Sales Reps are available to assist customers with specifying, selecting, and installing the product that best meets the need of their construction project.



R&D / TECH SUPPORT

Our Research & Development team is recognized as an industry expert in elastomeric polymer chemistry and protective coating technologies. Our laboratory maintains a full suite of testing equipment for determining the mechanical, chemical resistance, and weathering properties of coatings and coatings systems. Testing equipment includes a computer-controlled tensile tester, abrader, weatherometers, spectrophotometers, state-of-the-art environmental chambers with the ability to measure coatings cure over a wide range of temperatures and relative humidities, permeance testers, and viscometers for measuring coating “flow” for both brush/roll and spray applications. In addition, the laboratory is equipped with optical microscopy tools for examining coating film formation and defects. Attention to detail in our quality control lab assures our customers of receiving quality they can rely on with every batch.

FACILITIES

GAF is proud to invest in the future of the roofing industry. With extensive manufacturing facilities conveniently located across the United States, we’re increasing our manufacturing capabilities and expanding our services in order to serve our clients more efficiently and produce more industry-changing products than ever before.

ISO CERTIFICATION

GAF has earned ISO 9001 and ISO 14001 certifications. The ISO 9001:2008 quality management standards are recognized throughout the world. ISO 14001:2004 certification is an internationally recognized standard indicating a company has mitigated its environmental risks.





ABOUT GAF

Founded in 1886, GAF is the largest roofing manufacturer in North America. As the industry leader with over \$3 billion in sales, GAF proudly offers a comprehensive portfolio of award-winning, innovative roofing products for both steep-slope and commercial properties. Supported by an extensive national network of factory-certified contractors, GAF has built its reputation — and its success — on its steadfast commitment to Advanced Quality, Industry Expertise, and Solutions Made Simple.

GAF offers all major low-slope roofing technologies, including repair and maintenance products and roof restoration systems, as well as new roofing systems (BUR, modified bitumen, TPO, PVC, and composite systems). GAF has developed single-ply and asphaltic membranes with excellent durability and high reflectivity to meet the most rigorous industry standards while helping commercial property owners and designers reduce energy consumption.

For more information about GAF, visit gaf.com.



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