



# EPDM

DEFINING THE STANDARD

**CARLISLE**  
SYNTEC SYSTEMS



revolutionized the industry sustainable rooftop recyclability  
EPDM Membrane variety of products  
HISTORY AND PERFORMANCE a leader in quality stormwater  
eco-friendly **EXPERIENCE** retention  
LONG-TERM track record  
technology DEPENDABILITY tradition over 12 billion  
maximum protection ENERGY EFFICIENCY C O M M I T M E N T COMPREHENSIVE  
energy SUSTAINABLE OFFERINGS

### Defining the Standard

- » 50 years of proven performance
- » Over 15 billion square feet installed
- » More than 260,000 warranted installations
- » Nationwide network of quality-minded contractors

A half century ago, Carlisle revolutionized the commercial roofing industry with our EPDM membrane, establishing a track record of superior performance and quality that would become our hallmark. Today, more than 260,000 warranted Carlisle EPDM roof systems comprising over 15 billion square feet of membrane have been installed around the world. The history of Carlisle is built on EPDM, the number one membrane choice of consultants, contractors, architects and building owners everywhere.

Since the beginning, our attention has been devoted to the four pillars of success that customers value most: performance, energy efficiency, environmental sustainability

and innovation. These are the foundation of Carlisle's success and our commitment to every customer. Our decades-long experience with EPDM has allowed us to define the standards of quality and reliability.

What does it mean to define a standard? For Carlisle, it means offering the most durable membranes at the lowest overall lifecycle costs. It means more than pioneering EPDM—it means offering the first reinforced membrane, pressure-sensitive and prefabricated accessories, Factory-Applied Tape (FAT™) and the first ENERGY STAR®-qualified EPDM on the market.

Defining the standard means sustainable offerings such as the stormwater retention system and a comprehensive recycling program. It means maximum energy efficiency for every EPDM roof, regardless of climate. Carlisle EPDM continues to define the standard, leading the industry with a comprehensive product line of high-performance, eco-friendly and energy-efficient roofing materials.



puncture resistance fully adhered recyclability system enhancements  
watertight protection trusted coverage strong  
life-cycle cost SINGLE-PLY MEMBRANE foundation superior expansion  
versatile **PERFORMANCE** UV weather resistance technology REDUCE COSTS Sustainable  
FULLY ADHERED proven to perform ENERGY EFFICIENCY DECADES OF SERVICE

### The Standard for Performance

- » Superior resistance to UV, ozone and weathering
- » Full 60- or 90-mil thickness of weathering material, no internal scrim
- » Flexibility in all temperatures
- » Thermal shock durability
- » Proven hail resistance
- » Zero (no growth) rating for fungal growth

Carlisle EPDM is the ideal membrane for any climate or condition. An EPDM roof will expand and contract along with temperature changes, allowing it to perform like new for decades. When put to the test against Mother Nature, Carlisle EPDM comes out the clear winner, time-and-time again.

EPDM's superior physical characteristics allow it to stand up to UV exposure and freeze/thaw cycles. Our EPDM roof systems offer unmatched protection against winds up to 120 miles per hour, three-inch hailstones and accidental

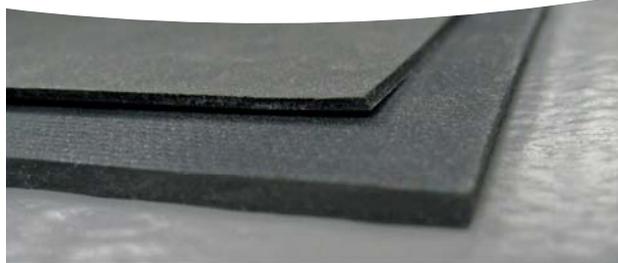
punctures. In fact, EPDM is the only Carlisle membrane that has been tested after 30 years of performing on a roof. The test results document EPDM's ability to maintain its flexibility, tensile strength, UV and tear resistance after 3 decades of service in the field.

Carlisle's hassle-free EPDM warranties range between 5 and 30 years depending on the customer's needs. All of these warranties provide building owners with a quality roof that's proven to perform.

Our 30-year Golden Seal Total System Warranty for EPDM roof systems sets the standard for long-term performance in the industry. This roof system features our 90-mil EPDM membrane, which is thicker and more durable than anything on the market, and is complemented by system enhancements and redundancy that ensure unparalleled quality for decades. Carlisle's 90-mil Sure-Seal® black EPDM also offers a 40-year non-pro-rated ELITE membrane material warranty, defining the standard for sustainability.

### Weathering the Hail Storm

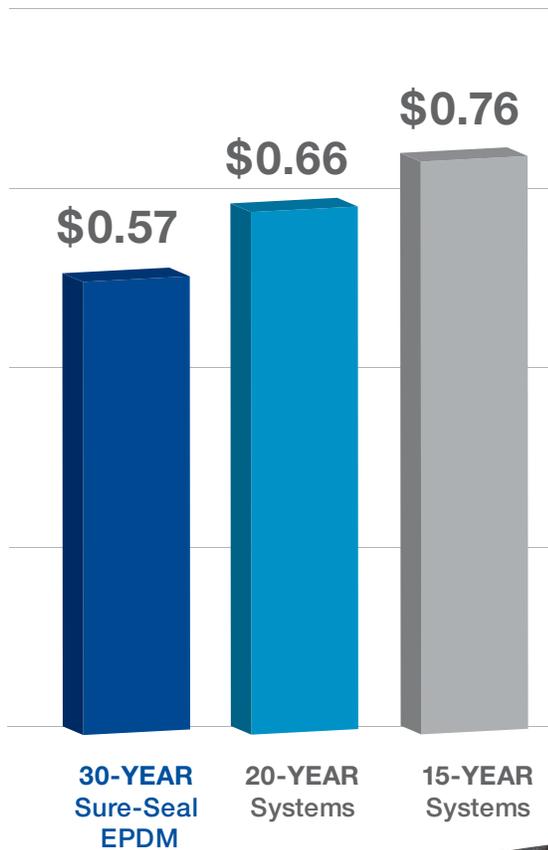
In an independent study conducted by Jim D. Koontz & Associates, Inc., new, heat-aged and field-aged EPDM samples were subjected to severe impact by various size hailstones ranging from 1.5" to 3" in diameter. Regardless of aging, nearly 95% of the EPDM samples passed ASTM standards for hail resistance. The results were overwhelmingly positive, proving that EPDM is an ideal roofing material for hail-prone areas or rooftops that experience excessive traffic.



The average annual costs of a 30-year Carlisle EPDM roof system offer significant savings beyond that of a typical 10- or 20-year roof system. A long-term EPDM solution reduces the hassle and costs associated with a lower-quality roof. A 30-year roof system can also reduce the amount of waste taken to landfills because roof replacement and disposal occur less frequently.

## Annualized Cost Per Square Foot

INVEST TODAY AND SAVE LATER



## Aged EPDM Makes the Grade

Carlisle EPDM samples taken from 30-year old rooftops were analyzed for the following properties:

- » Elongation (ASTM D4637)
- » Tensile strength (ASTM D4637)
- » Thickness XD (ASTM D4637)
- » Thickness MD (ASTM D4637)
- » Factory seam strength (ASTM D816)

All of them performed well above ASTM standards for aged membranes, and they all exhibited elongation up to 300%, a key attribute in providing the flexibility necessary to withstand extreme temperature changes on the rooftop.

Most of the samples even tested at or above ASTM standards for new membranes, proving that even 30-year-old EPDM has the physical attributes to provide building owners with the watertight protection they want and need.



provide protection state-of-the-art field experience  
revolutionary products system integrity dedicated  
material of choice SINGLE-PLY MEMBRANE safeguard LONG-LASTING  
resilient **SUSTAINABILITY** enthusiasm  
unsurpassed warranties technology **OUTPERFORMS** tear-resistance  
HALF-CENTURY TRACK RECORD emphasis on quality LOW LIFE-CYCLE COSTS

### The Standard of Sustainability

- » Lowest lifecycle costs of any commercial roofing material
- » Recyclable membranes keep waste out of landfills
- » Stormwater retention options reduce building footprint
- » Contributes toward LEED® certification

### Performance & Savings —Cradle to Grave

The Athena Institute, a non-profit lifecycle analysis (LCA) organization specializing in building materials, recently updated its EcoCalculator to include LCA data for EPDM membranes. The institute found that EPDM has the lowest Global Warming Potential of any major commercial roofing material.

In fact, EPDM can offset its carbon footprint in as little as 15 years, compared to other materials that may require up to 54 years of service life to equal the carbon footprint resulting from their manufacturing process.

Carlisle EPDM roof systems provide performance and savings for decades. Long-term analysis demonstrates that choosing EPDM can cut the lifecycle costs of a roof by as much as 25%, an investment resulting in savings throughout the life of the roof.

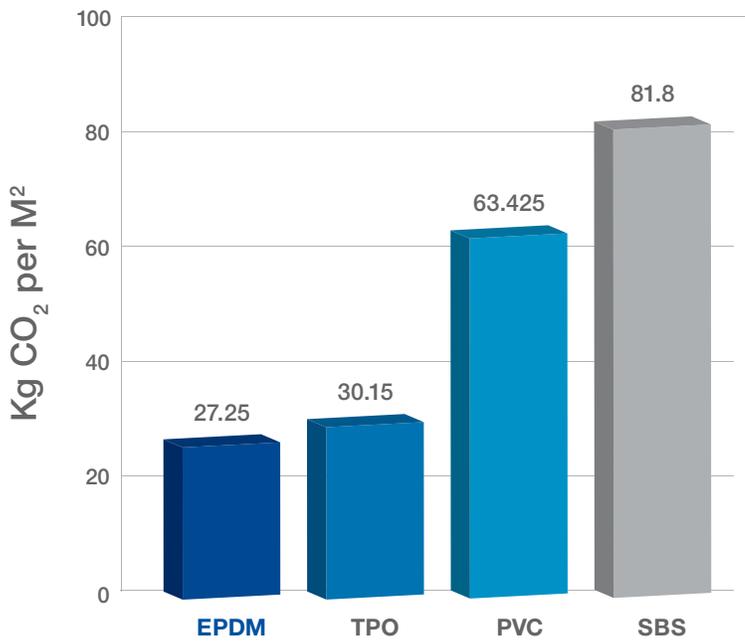
Research demonstrates that the amount of energy required to produce EPDM, from extraction to installation, is lower than any other single-ply material. Low-VOC primers, adhesives, and membrane cleaners further reduce the environmental impact of EPDM roofing systems.

Carlisle's focus on sustainability does not end there. Reduced landfill space and increasing waste disposal costs throughout the nation have led to heightened interest in rooftop recycling. EPDM is an inherently recyclable membrane that is useful in many post-consumer applications. Even the ballast and insulation taken from an EPDM roof can be reused or recycled.



Our environmental awareness has led to the development of the Stormwater Retention option for ballasted roof systems, which reduces peak stormwater runoff. This unique system addresses a growing problem in cities with outdated stormwater systems that overflow in heavy rain events. A Ballasted Stormwater Retention System can also lessen a building's overall footprint and potentially contribute to LEED accreditation by reducing or eliminating the need for large stormwater collection basins.

## Global Warming Potential



Based on averages of membranes tested.

## LEEDing the Way

Carlisle's EPDM membranes can contribute significantly to LEED certification credits. In fact, when it comes to building for a healthier environment, EPDM is the black-and-white winner against all other membranes.

LEED awards one credit under Sustainable Sites-7.2 Heat Island Reduction Roofs for using reflective roofing materials. Our Sure-White™ EPDM membrane qualifies for this credit.

**However, research suggests that dark-colored EPDM can help lower energy costs and carbon emissions in northern climates where heating costs are typically five times higher than cooling costs.** Carlisle has developed two scenarios utilizing EPDM roof systems in ASHRAE Zones 4 and above that allow you to secure a LEED credit and receive the most energy-efficient roof system possible.

» **ID Credit 1: Innovation in Design**

Awarded for exceptional performance above LEED requirements or innovative performance not addressed by LEED

» **RP Credit 1: Regional Priority**

Awarded for achievements that address geographically specific environmental priorities



conservation clean resources improved productivity  
 stay green design and engineering system integrity renewable  
 health forward thinking RECYCLING PROGRAM sustainable community  
 great economic benefits **ENERGY EFFICIENCY** caring enhanced  
 maximized technology CUTTING-EDGE positive impact  
 savings PROTECTING THE ATMOSPHERE INCREASED PROPERTY VALUE technology roadmap

### The Standard of Energy Efficiency

- » Optimal energy-saving solutions for buildings in any location
- » DOE Cool Roof Calculator shows the warming benefit of dark colored EPDM membranes, which help reduce heating costs
- » Plastic membranes are limited to light colors due to accelerated weathering and heat-aging concerns
- » The industry's first ENERGY STAR-qualified white EPDM membrane reduces cooling costs<sup>1</sup>
- » Ballasted EPDM roof systems are recognized as "cool roof" alternatives by ENERGY STAR, ASHRAE, Chicago Building Code and California's Title 24

When it comes to energy-efficient roofing, EPDM has the unique ability to benefit you in any climate. Data from the U.S. Department of Energy shows that heating is the largest consumer of energy in commercial buildings. Space heating consumes five times more energy than space cooling on average.

In central and northern states, dark-colored EPDM saves energy by reducing these costly heating demands. In southern climates, where reflective roofs can help keep a building cooler and reduce its air conditioning costs, you can take advantage of Carlisle's Sure-White, the first ENERGY STAR-qualified white EPDM membrane on the market. By reducing heating and cooling demand, an appropriate EPDM roof system can reduce carbon emissions and conserve natural resources.

Energy Consumption		
Building Type	Space Heating % of total	Space Cooling % of total
Education	33%	5%
Health Care	55%	10%
Retail & Service	31%	6%
Office	24%	9%
Public Assembly	54%	6%
Warehouse & Storage	16%	1%
<b>All Buildings</b>	<b>29%</b>	<b>6%</b>

**Nearly 5 times higher than cooling costs.**

Buildings Energy Data Book: 714 Typical Commercial Buildings September 2007

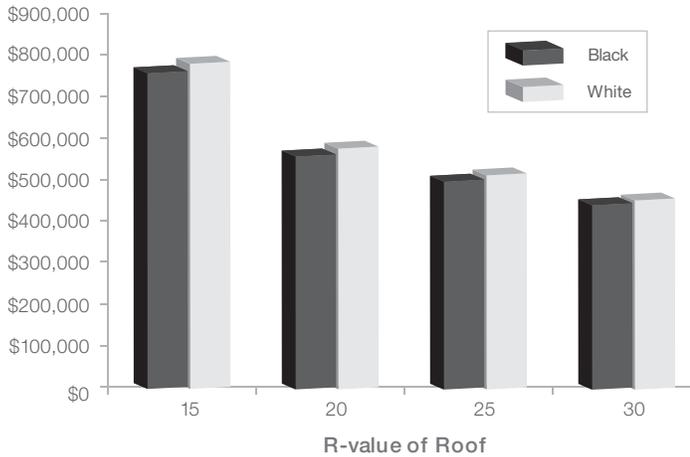
<sup>1</sup> The ENERGY STAR program recommends using the Roof Savings Calculator ([rsc.ornl.gov](http://rsc.ornl.gov)) to determine if a white reflective roof will save or cost you money compared to a dark-colored roof depending on geographic climate conditions, building location, and other variables.



## Washington D.C.

### Energy Cost Comparison

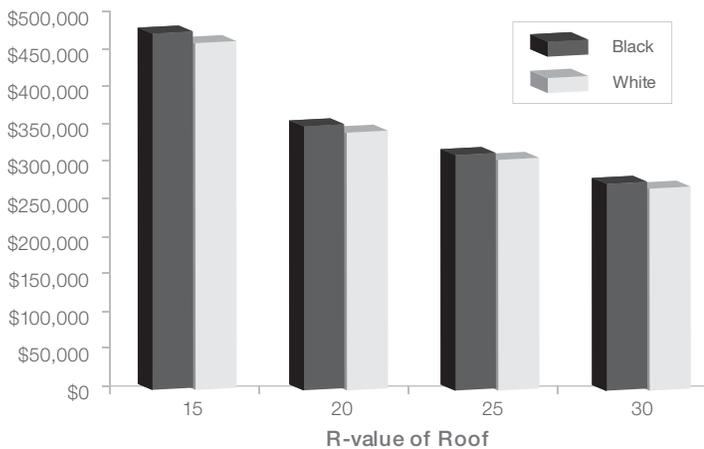
20-YEAR ENERGY COSTS BLACK VS. WHITE



## Atlanta, GA

### Energy Cost Comparison

20-YEAR ENERGY COSTS BLACK VS. WHITE



## A New (Old) Take on Cool Roofing

The Single-Ply Roofing Institute (SPRI), Oak Ridge National Laboratory and EPDM Roofing Association (ERA) conducted a study that found certain ballast and paver EPDM roof systems provide energy-saving benefits equal to cool or reflective roofs.

According to the study entitled, “Evaluating the Energy Performance of Ballasted Roof Systems,” medium (16.8 lbs/ft<sup>2</sup>) and heavy (23.5 lbs/ft<sup>2</sup>) ballast featured peak heat flows lower than white membrane roofs after as little as two years.<sup>2</sup> Unlike a white, reflective roofing material, there is no need to periodically clean a ballasted roof system in order to maintain its “cool roof” performance. Ballasted roofs are quick and easy to install, extremely long lasting, and more economical than most systems on the market. Certain ballasted roof systems are now recognized as equivalents to reflective roofs by the following groups.

- » California Energy Commission (Title 24)
- » City of Chicago Building Code
- » ASHRAE, Standard 90.1

<sup>2</sup> Andre Desjarlais, lead researcher at Oak Ridge National Laboratory



strength watertightness full potential  
investment horizon professionalism leading presence  
testing strength PROMOTING KNOWLEDGE ROOFING EXPERTS  
environmentally responsible **INNOVATION** dependable service  
real solutions  
advancement SECURED FUTURE unprecedented  
EXPLORATION growth potential CONTINUED SUPPORT high performance  
pioneer opportunities

### The Standard of Innovation

- » Factory-Applied Tape (FAT) reduces seaming time and increases seam performance
- » Prefabricated, pressure-sensitive accessories manufactured in a factory-controlled environment
- » Broad product line to meet the needs of any project
- » Wide-width membranes reduce number of field seams and increase speed of installation

Carlisle revolutionized the commercial roofing business with a simple idea: provide a roof system that offers better performance than asphalt-based built-up systems without the hassle of field assembly. EPDM achieved this goal, and since its introduction, innovation continues to be one of our foremost goals.

Each year, we listen to our customers and develop innovative technologies that make EPDM installations faster, easier and more cost effective. Our products are subjected to rigorous testing, field evaluations and strict quality controls that ensure these technologies continue to perform.

Carlisle recognized the limitations of adhesive-based seaming and led the revolutionary seam tape movement. Our Factory-Applied Tape (FAT) took seam technology to the next level by applying the tape to the membrane in a quality-controlled environment.

FAT is now available on over 60 variations of Carlisle EPDM, providing uniform adhesive width and thickness that increases installation efficiency and quality. In side-by-side testing, FAT delivered 30% greater peel and 32% greater shear strength than traditional EPDM seaming methods.

Traditional flashing details are no match for the uniform quality of Carlisle's pressure-sensitive, prefabricated EPDM accessories. From pipe boots to pourable sealer pockets, these products alleviate the frustration of field-fabricated details by offering an alternative that saves time, energy, and money.

Carlisle also offers the most diverse line of EPDM membranes, which means you can get the perfect product for your specific needs. More sizes and thicknesses of EPDM are available than for any single-ply roofing material on the market. Our EPDM membranes are available in formats of up to 200-foot lengths and 50-foot widths, allowing far greater areas to be covered in less time with fewer seams.

These innovations are just a few of the many that Carlisle has introduced to the market throughout our history.

**You can rest assured that our mission to define the standard will continue to raise the bar for years to come.**







800-479-6832 • P.O. Box 7000 • Carlisle, PA 17013 • Fax: 717-245-7053 • [www.carlisesyntec.com](http://www.carlisesyntec.com)

Carlisle, FAT, Sure-Seal and Sure-White are trademarks of Carlisle. LEED is a registered trademark of the United States Green Building Council.

ENERGY STAR is a registered trademark owned by the U.S. Government.

REPRINT CODE: 605422 - "EPDM Defining the Standard Brochure" © 2015 Carlisle.