

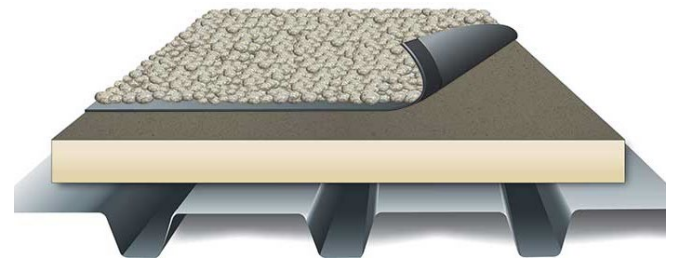
Why Roof Performance Matters

Cool roofs have become one of several accepted strategies for mitigating the impacts of urban heat islands and have long been a prescriptive requirement of ASHRAE 90.1-2019 and the IECC in Climate Zones 1, 2, and 3. Cool roofs are generally a white or high-albedo roofing surface material that reflects a portion of the incoming solar radiation away from a building's roof before it is transmitted to and absorbed by the building. This reduction in solar heat gain decreases space cooling, increases space heating requirements but tends to increase overall building energy use in heating dominated climates.

Research conducted by ERA found cool roofs tend to provide a marginal and **positive reduction in energy use across all modeled climate zones** when installed with traditional levels of insulation, for most commercial building types with low sloped roofs and insulation installed entirely above deck. However, those impacts tend to marginally decrease when coupled with increased levels of insulation and for colder compared to warmer climate zones, reducing the incremental benefit of cool roofs as a mitigation strategy for roof replacements required to meet the prescriptive insulation requirements of ASHRAE Standard 90.1-2019 and the IECC.

What is EPDM?

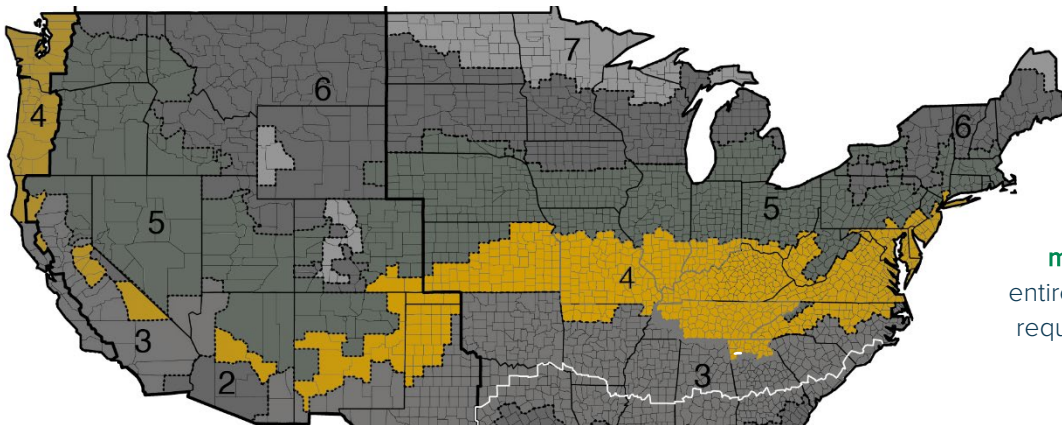
EPDM is a very **durable synthetic rubber roofing membrane** widely used in low-slope buildings in the United States and worldwide. EPDM is available in both black and white/reflective, and is sold a broad variety of widths, can be installed either fully adhered, mechanically attached or ballasted, with the seams of the roofing system sealed with liquid adhesives or specially formulated tape.



Above: A diagram of EPDM single-ply rubber roofing membrane, which has been widely used in the low-slope commercial roofing industry for over 40 years.

Finding the Right Insulation for your Climate – Zone 4

Cities that are located within **U.S. Climate Zone 4** are characterized as **mixed climates**, which can be defined as an area that has approximately 5,400 or fewer heating degree days (at 65 degrees Fahrenheit basis), and where the average monthly outdoor temperature drops below 45 degrees in Winter months.







The high humidity and fluctuating temperatures that are typical of this city and region require a high degree of **resilience and flexibility** in building product performance.

For buildings located in **Climate Zone 4**, current model energy codes require a **minimum R-30** for roof insulation installed entirely above the deck. There is no cool roof requirement in Climate Zone 4 prescribed by either ASHRAE 90.1-2019 or the IECC.

- Minimum R-30 insulation
- Resistance to humidity and weathering
- Thermal shock durability
- Flexibility in hot and cold temperatures

WHAT TO LOOK FOR IN CLIMATE ZONE 4

Potential Savings Estimates for Buildings in Climate Zone 4

BUILDING TYPE		BLACK ROOF W/ CODE LEVELS OF INSULATION ¹	WHITE ROOF W/ BASELINE LEVELS OF INSULATION ²	WHITE ROOF W/ CODE LEVELS OF INSULATION
 PRIMARY SCHOOL	BCR (Savings to Investment Ratio)	1.6	2.4	1.5
	Annual Energy Savings (%)	7.6%	1.5%	8.6%
	Cumulative Energy Cost Savings / Sq. Ft.	\$2.85	\$0.93	\$3.32
	Cumulative CO ₂ e (lb) / Sq. Ft.	71.7	14.7	80.3
 MEDIUM OFFICE	BCR (Savings to Investment Ratio)	1.1	0.7	1
	Annual Energy Savings (%)	1.4%	0.1%	1.5%
	Cumulative Energy Cost Savings / Sq. Ft.	\$0.65	\$0.10	\$0.78
	Cumulative CO ₂ e (lb) / Sq. Ft.	7	1.3	7.3
 WAREHOUSE	BCR (Savings to Investment Ratio)	0.4	0.3	0.3
	Annual Energy Savings (%)	7.5%	-0.1%	7.3%
	Cumulative Energy Cost Savings / Sq. Ft.	\$0.75	\$0.10	\$0.78
	Cumulative Total CO ₂ e / Sq. Ft.	15	3.3	15
 HOSPITAL	BCR (Savings to Investment Ratio)	1.3	2.45	1.2
	Annual Energy Savings (%)	1.1%	0.2%	1.1%
	Cumulative Energy Cost Savings / Sq. Ft.	\$0.49	\$0.19	\$0.55
	Cumulative Total CO ₂ e / Sq. Ft.	12	2.7	12.7

In mixed climate zones that exhibit high levels of humidity and where building energy use fluctuates between cooling and heating processes, inefficient roofing insulation can lead to wasted gas and electricity, resulting in high utility bills. Installing durable and high-performing insulation in commercial buildings results in increased resilience, energy and cost savings, improved building performance, and upgraded sustainability as well as lessened risk and likelihood of premature maintenance and repairs. When viewed as a long-lasting investment, an EPDM membrane can yield multiple benefits while reducing costs and maintenance for building owners. **This analysis was prepared by ICF. For more information on roof systems and insulation and to access the full report, visit www.epdmroofs.org.**

About ERA

The EPDM Roofing Association (ERA) represents the manufacturers of many single-ply roofing products. Through ERA, the leading roofing industry manufacturers speak with a focused voice to provide technical and research support, offer sustainable and resilient roofing solutions, and communicate the longstanding attributes, consistency, and value of various single-ply roofing systems.

1. Prescriptive insulation requirements of ASHRAE Standard 90.1-2019 and the IECC.

2. Baseline level of insulation is R-12.5