

Dear Building Owners and Facility Managers,

As a leader in the commercial roofing industry and the largest manufacturer of both white and black roofing membranes, Carlisle Construction Materials continues to advocate careful selection of roofing systems based on a building's design, location, and climatic conditions. In this day and age when roofing system selection is often influenced by energy efficiency and environmental attributes, long-term sustainability of a roofing system is critical. Despite good intentions, the ENERGY STAR® ratings on roofing products may cause individuals to select a white roofing membrane when a dark-colored membrane would be a better option.

According to ENERGY STAR, a U.S. Environmental Protection Agency program, its purpose is to "help businesses and individuals save money and protect our environment through superior energy efficiency." The ENERGY STAR label has been applied to various white membranes, including TPO, PVC, and EPDM, because they can help reduce air conditioning costs through solar reflectance. While this reflectance may pay dividends in hot, Southern climates, a white roofing system can actually *increase* total energy usage in cooler, Northern climates where heating costs are generally five times greater than cooling costs.

An often-overlooked caveat on ENERGY STAR's website cautions, "before selecting a roofing product based on expected energy savings, consumers should explore the expected calculated results that can be found on the Department of Energy's 'Roof Savings Calculator,'" and "please remember the energy savings that can be achieved with reflective roofing is highly dependent on facility design, insulation used, climatic conditions, building location, and building envelope efficiency."

Nevertheless, ENERGY STAR labels are placed on reflective roofing membrane used in both Southern *and* Northern climates, creating the perception that white membrane equals energy efficiency, regardless of where it is used. The ENERGY STAR label can unintentionally contribute to the misconception that one component of a roofing system can make the whole system energy-efficient. In fact, overall thermal performance of a roofing system is based on numerous factors: insulation levels, staggering of insulation joints, thermal bridging of fasteners, use of vapor barriers, building type, and climatic conditions. The additional heating burden placed on buildings with white roofs in Northern climates increases heating costs and adversely impacts the environment through increased consumption of natural resources. Since high reflectivity can be counterproductive in cool climates, it appears that the ENERGY STAR labeling of roof products should be reexamined to help building owners in Northern climates truly save money and conserve natural resources.

A bias toward reflective membranes seems to run counter to ENERGY STAR's mission. The organization also seems to ignore the fact that, according to the Roof Savings Calculator examples on the following page, selecting a dark membrane color designed to reduce heating consumption in Northern climates is energy-efficient, cost-effective for building owners, and good for the environment in many cases.

Sincerely,



Ronald L. Goodman

Marketing Manager, EPDM and Fleece Roofing Systems

Roof Savings Calculator (ORNL / LBNL)
Comparison of Black vs. White roof color for Top 25 U.S. Cities in colder climates
R-20 Insulation with Gas Heat

City	ST.	Cooling Benefit	Heating Penalty	Net Annual Impact	Energy Efficient Color	Electric Cooling Rate	Gas Heating Rate
		w/ White	w/ White	w/ White		cents/kWh	\$/1000 ft3
New York City	NY	\$159	(\$501)	(\$342)	Black	15.11	8.32
Chicago	IL	\$111	(\$420)	(\$309)	Black	8.07	7.04
Philadelphia	PA	\$161	(\$541)	(\$380)	Black	9.33	9.87
Indianapolis	IN	\$129	(\$471)	(\$342)	Black	9.14	7.29
San Francisco	CA	\$80	(\$723)	(\$643)	Black	16.94	8.46
Columbus	OH	\$148	(\$422)	(\$274)	Black	9.41	7.14
Charlotte	NC	\$226	(\$445)	(\$219)	Black	8.73	9.79
Detroit	MI	\$119	(\$467)	(\$348)	Black	10.95	7.51
Boston	MA	\$167	(\$657)	(\$490)	Black	14.14	11.44
Seattle	WA	\$61	(\$498)	(\$437)	Black	7.69	9.11
Denver	CO	\$168	(\$435)	(\$267)	Black	9.42	6.84
Washington	DC	\$217	(\$627)	(\$410)	Black	11.95	12.02
Nashville	TN	\$257	(\$388)	(\$131)	Black	10.26	7.65
Baltimore	MD	\$189	(\$485)	(\$296)	Black	10.43	9.30
Louisville	KY	\$197	(\$348)	(\$151)	Black	8.72	7.02
Portland	OR	\$81	(\$669)	(\$588)	Black	8.36	8.96
Milwaukee	WI	\$85	(\$504)	(\$419)	Black	10.57	7.05
Kansas City	MO	\$181	(\$379)	(\$198)	Black	9.20	8.17
Virginia Beach	VA	\$183	(\$394)	(\$211)	Black	8.06	8.21
Colorado Springs	CO	\$124	(\$508)	(\$384)	Black	9.42	6.84
Raleigh	NC	\$257	(\$459)	(\$202)	Black	8.73	9.79
Omaha	NE	\$122	(\$416)	(\$294)	Black	8.40	6.33
Oakland	CA	\$80	(\$723)	(\$643)	Black	16.94	8.46
Minneapolis	MN	\$76	(\$431)	(\$355)	Black	8.95	6.48
Cleveland	OH	\$146	(\$376)	(\$230)	Black	9.41	7.14

Assumptions:

- 10,000 sq.ft. building with 1 floor, 40% window to wall ratio, and post 1990 construction
- Mid efficiency heating and cooling equipment
- Aged Reflectance; Blk EPDM=9, White=70