

Windows regardless of age, condition, or design reflect a certain amount of heat. When heat reflection surpasses a certain intensity, this effect can cause damage to nearby surfaces, including turf, vinyl siding, composite decking, and other building and landscaping surfaces.

According to the [U.S. Department of Energy](#), up to 80 percent of windows sold annually to homes and 50 percent of sales to commercial buildings feature a low-emissivity (low-e) coating. These windows, while energy efficient, are also known for damaging nearby building components as a result of their increased reflectivity of long-wave infrared energy and short-wave ultraviolet light. So at the same time as low-e coated windows protect materials inside of a building, they will increase exterior materials' exposure to heat and light.

However low-e coatings are not solely to blame for damaging reflection on vinyl siding and other surfaces. The [National Association of Home Builders \(NAHB\) identified](#) several other contributing factors including:

- Angle of the sun relative to the horizon
- Proximity to neighboring buildings
- Wind speed
- Air temperature
- Presence of buffering foliage

An additional source of reflectivity issues is double-pane windows that may warp thanks to differences in barometric pressure between the interior of glass panes and outside air pressure. The NAHB's research found that under certain conditions these concave double pane windows may become develop a significant enough curvature as to concentrate the reflected solar rays, with the focused reflected sunlight generating surface temperatures "well above that encountered from direct sunlight."

The concavity noted by the NAHB does not affect the window's overall performance, but the concavity acts in the same way as "when light passes through a magnifying glass." The resulting effect can raise surface temperature to over 200°F (93°C), enough to cause damage to certain building and landscaping materials.

The 3M™ Prestige Exterior Window Film reduces the transmission of solar energy through window glass. This is accomplished by both reflecting and absorbing solar energy at the outside surface of the window. As a result of its construction, Prestige Exterior Window Film absorbs much of the long-wave infrared energy before it reaches low-e surfaces on interior glass that can cause damaging reflections.

For concave double pane windows, 3M™ Prestige Exterior Window Film can reduce the intensity of concentrated reflected energy, but it cannot correct the glass curvature. Reflectivity issues caused by window concavity due to pressure differences will be lessened but not eliminated. Therefore, damage to nearby materials may still occur even with Prestige Exterior Window Film installed.

3M™ Prestige Exterior Window Film has successfully been applied to mitigate reflectivity effects from low-e coated and concave windows, reducing instances of melting, discoloration, and other types of damage to nearby surfaces. However, users should remain aware that there are a multitude of factors contributing to reflectivity issues, and Prestige Exterior Window Film may not be able to solve every situation.

Health and Safety

CAUTION

When handling any chemical products, read the manufacturers' container labels and the safety data sheets (SDS) for important health, safety, and environmental information. To obtain SDS for 3M products go to [3M.com/SDS](https://www.3m.com/SDS). To request SDS by mail, or in case of an urgent situation, call 1-800-364-3577 or 1-651-737-6501.

When using any equipment, always follow the manufacturer's instructions for safe operation.

3M™ Prestige Exterior Window Film Effectiveness in Mitigating Reflection Damage

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