

Product Description

3M™ Cooling Film is a passive cooling film designed to limit solar heat gain on exterior transportation surfaces, reducing heat absorption and interior vehicle temperatures.

Product Features

- Over 85% solar reflectivity
- Low light absorption decreases solar heating of the substrate under direct sunlight
- Dirt and chemical resistance to maintain solar reflectivity
- 91% emissivity increases radiative cooling
- Flexible; conforms to compound curves, corrugations, and rivets
- This film utilizes 3M™ Controltac™ and 3M™ Comply™ technology
- Controltac™ minimizes the initial contact area of the adhesive for easy sliding, tacking, snap-up, and repositioning
- Comply™ allows air to exit through air release channels to the edge of the graphic for fast, easy, bubble-free installations
- Dry application
- Expected performance life of seven years (unwarranted period for film applied to a flat, vertical, or non-vertical surface under Northern European climate conditions)

Applications

- Rooftop applications on vehicles, cargo vans, recreational vehicles, buses and transit vehicles, straight trucks, semi-trucks, semi-trailers, rail cars, and locomotives
- Commercial refrigeration/HVAC units
- Electrical transformers/outdoor electrical boxes
- Mobile energy units

3M™ MCS™ Warranty

3M™ Cooling Film is backed by a comprehensive 3M™ MCS™ Warranty for five years from the date of installation. See www.3mgraphics.com/warranties for details.

Characteristics

These values are for reference only. The following technical information and data are based upon limited 3M testing conditions and should not be used for specification purposes.

Physical Characteristics

Characteristic	Value
Material	PVC
Film Color	White, opaque
Thickness	Film and adhesive: 0.152 mm to 0.178 mm (152 µm to 178 µm) Without adhesive: 0.127 mm to 0.137 mm (127 µm to 137 µm)
Adhesive	Pressure-activated, clear
Liner	Polyethylene-coated paper
Typical Adhesion 24 Hours After Application	- Stainless steel: 17.5 to 26.3 N/25 mm (4 to 6 lbf/in.) - Aluminum, etched: 22 to 26.3 N/25 mm (5 to 6 lbf/in.) - Aluminum, anodized: 30.8 to 35.0 N/25 mm (7 to 8 lbf/in.) - Fruehauf pre-painted panels: 13.3 to 22 N/25 mm (3 to 5 lbf/in.) - Fiberglass: 13.3 to 17.5 N/25 mm (3 to 4 lbf/in.) - ABS: 17.5 to 22 N/25 mm (4 to 5 lbf/in.) - Polycarbonate: 17.5 to 26.3 N/25 mm (4 to 6 lbf/in.) - Acrylic: 17.5 to 26.3 N/25 mm (4 to 6 lbf/in.)
Tensile Strength (minimum) (ASTM D882-18)	1.79 kg/cm (10 lbs/in.) at 23°C (73°F)
Applied Shrinkage	0.25 mm (0.01 in.)
Chemical Resistance	- Resists mild alkalis, mild acids, and salt - Excellent resistance to water (does not include immersion)
Removability	Removable with heat and/or chemicals
Solar Reflectivity, ρ_d (ASTM E903-12)	85%
Emissivity, ϵ_H (ASTM E408-13)	91%
Thermal Conductivity, K (ASTM D5470-06)	0.25 W/mK
Flammability	Flammability standards are different from country to country. Ask your local 3M contact for details, please.

Application Characteristics

Characteristic	Value
Application Substrates	- Stainless steel - Bare aluminum - Galvanized sheet metal (prime and paint) - Painted metal* - Rigid plastics *Check adhesion to powder-coated or water-based paints. Some composites and plastics tend to outgas. Test composites and plastics prior to application.
Application Temperature	16 C to 38 C (60 F to 100 F) air, film, and substrate 3M recommends application at 18°C to 23°C (64.4°F to 73.4°F) for optimum ease of application.
Service Temperature Range	-29 C to 79 C (-20 F to 175 F) (Though not for extended periods of time at the extremes.)

Factors Affecting Film Performance Life

The actual performance life of the film is affected by:

- Selection, condition, and preparation of the substrate
- Application methods
- Cleaning or maintenance methods
- Environmental conditions

Factors Affecting Cooling Performance

The effectiveness of the film's cooling performance is affected by:

- Exposure conditions
- Weather and climate
- Substrate temperature
- Insulation or thermal conductivity of the substrate
- Vehicle configuration

Film Processing

Printing

This product is NOT printable.

Cutting and Installation

See [3M Instruction Bulletin Production: Cutting](#) for details.

Electrocut characters or graphics can be installed on top of 3M™ Cooling Film, however, doing so will reduce the cooling performance of the film.

Finishing

- 3M™ Cooling Film may tent around rivets, corrugations, and sharp angles. This does not inhibit the film's cooling performance. Apply heat (54.4°C – 60°C; 130°F – 140°F) to the film to conform the film to the substrate.
- This film may be patched with another piece of the film if a section of it is cut, gouged, or otherwise damaged.

Maintenance and Cleaning

Clean 3M™ Cooling Film a minimum of four times per year, and more frequently in dirty environments, to maintain the film's cooling performance.

Use a cleaner designed for high-quality painted surfaces. The cleaner must be wet, non-abrasive, without strong solvents, and have a pH value between 3 and 11 (neither strongly acidic nor strongly alkaline). See [3M Instruction Bulletin Maintenance](#) for details.

Shelf Life and Storage

Shelf Life

The shelf life is **never more than three years** from the date of manufacture on the original box.

Storage Conditions

- 4°C to 38°C (40°F to 100°F) maximum
- Out of sunlight
- Clean, dry area
- Original container
- Bring the film to room temperature before using

3M Related Literature

In addition to other 3M bulletins specified in this document, the following bulletins provide details users may need to successfully apply this film.

- [3M Instruction Bulletin Production: Cutting](#)
- [3M Instruction Bulletin 3M™ Cooling Film](#)
- [3M Instruction Bulletin Application: Vehicles](#)
 - Complete the 3M Pre-Installation Inspection Record found in this instruction bulletin prior to applying 3M™ Cooling Film to an automobile, van, or bus.
- [3M Instruction Bulletin Application: Trailers](#)
- [3M Instruction Bulletin Application: Rail](#)
- [3M Instruction Bulletin Application: General Installation Techniques](#)
- [3M Instruction Bulletin Maintenance](#)
- [3M Product and Instruction Bulletin V-Tools 3M™ Vehicle Channel Applicator Tools](#)

Health and Safety

Chemicals

When handling any chemical products, read the manufacturers' container labels and the safety data sheets (SDS) for important health, safety, and environmental information.

[Follow this link to obtain SDS sheets for 3M products.](#)

[Follow this link to obtain information about substances of very high concern \(SVHC\) for EU products.](#)

Tools and Equipment Usage

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

Warranty Information

Technical Information

Technical information, guidance, and other statements provided by 3M are based upon records, tests, or experience that 3M believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed. Such information is intended for people with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license to any intellectual property rights is granted or implied with respect to this technical information.

Product Selection and Use

Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment, reviewing all applicable regulations and standards, and reviewing the product label and use instructions. Failure to properly evaluate, select, and use a 3M product in accordance with instructions or to meet all applicable safety regulations may result in injury, sickness, death, and/or harm to property.

Warranty, Limited Remedy, and Disclaimer

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Limitation of Liability

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