



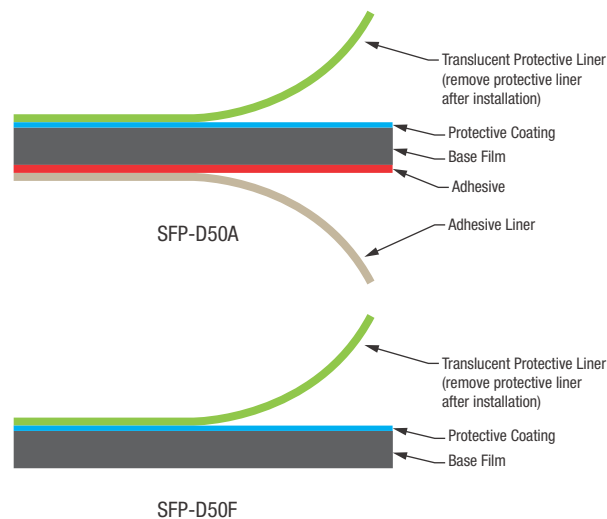
## Product Description

3M Specular Film SFP-D50 (the "Product") is a polymeric film providing specular reflection with greater than 98% photopic reflectivity. This non-corroding and non-conducting product is well suited for LED lighting applications where highly efficient optical design and high radiant flux density (such as that from an LED) is utilized.

## Application Surfaces

The application surface must be clean and free of any residue before applying the Product. Typical application surfaces include polycarbonate, ABS (Acrylonitrile Butadiene Styrene), PETG (Polyethylene Terephthalate Glycol), Acrylic, PVC, and Aluminum.

## Product Construction



## General Installation Instructions

For maximum adhesion, clean the substrate of all oils, lubricants, or residual coatings prior to installing the Product.

Leave the Product's protective liner on until the installation is complete. To remove the protective liner, apply a short piece of masking tape near a corner of the Product and peel the protective liner back on itself.

### Installation Method for Smooth Surfaces

1. If the substrate surface has a heavy coating of grease, use a detergent to clean the substrate. Rinse and dry, and then clean with 99.5% Isopropyl alcohol.
2. Apply the Product to the substrate using a non-abrasive applicator tool.
3. Remove the protective liner.
4. To enhance adhesion, the applied Product and its substrate can be placed in an oven for one hour at 225° F (107°C).

### **Installation Method for Challenging Surfaces**

1. If the substrate surface has a heavy coating of grease, use a detergent to clean the substrate. Rinse, and dry, and then clean with 99.5% Isopropyl alcohol.
2. Apply 3M™ Primer 94 to the substrate to enhance film adhesion. Follow the instructions provided.
3. Apply the Product to the substrate.
4. Remove the protective liner.
5. To further enhance adhesion, the applied Product and its substrate can be placed in an oven for one hour at 225 °F (107 °C).

### **SFP-D50A Thermoforming Application Instructions**

SFP-D50A can be thermoformed in shallow draw applications where reduction in thickness can be maintained to be less than 20%. This ensures high optical and mechanical uniformity.

- Laminate temperature can reach up to 330 to 380F, depending on the substrate used and uniformity of heat (to avoid localized overheating).
- Thermoformable substrate selection and preparation
  - This film needs to be laminated on a thermoformable substrate, such as polycarbonate, acrylic, etc.
  - Typical substrates can vary in thickness from 0.010 in. to 0.250 in.
  - Select the thickness of the substrate based on the size and rigidity requirements of the final parts.
  - Clean the substrate surfaces before lamination. Use a soft, lint-free cloth and 70% Isopropyl alcohol solution for cleaning.
  - Keep the protective liner on the film during lamination.
- Thermoforming tool design
  - Both female and male tools can be used. Female tools are preferred.
  - This material works for thermoformed parts with simple geometries of aspect ratio up to 0.25 (height/width).
- Thermoforming conditions
  - Tool temperature is between 250 °F and 280 °F for heat stability of the formed parts.
  - Unbalanced heating is used for avoiding film burning. The heating power from the substrate side should be 30%~40% higher than from the mirror film side.
  - Dry the material before thermoforming. Typical drying conditions are at 250 °F (121 °C) for 2 hours. For SFP-D50A laminated on acrylic plates, dry at 185 °F (85 °C) for 3 hours, then increase to 250 °F (121 °C) for 2 hours, or dry at 185 °F (85 °C) for at least 6 hours. All the laminates should be dried to bubble free before thermoforming.
- Thermal stability of the formed parts
  - Maximum temperature is 185 °F (85 °C) without failure

### **Uses of SFP-D50 Films**

- Applied to die-cut
- Stickers
- Appliqués
- Applied to fixture cavities
- Injection molded
- Metal cast
- Pre-formed
- Free stand die cut parts
- Die cut parts for lamination
- Pre-laminated sheets
- Low aspect ratio thermoformed parts

### Application Characteristics

Characteristic	Description
Surface Type	Flat and simple curved surfaces
Substrate Type	<ul style="list-style-type: none"><li>Laminated on any substrate the user tests and approves</li><li>Cold formed on aluminum sheeting</li></ul>
Application Temperature	72 °F (22 °C) minimum

The data in this section are based on test data from 2010 - 2011 and are deemed reliable, but not warranted. The acronyms and equations below will be referenced in the following table and charts.

### Handling and Fabrication



CAUTION

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



CAUTION

**Handling.** If purchased in a roll, its weight typically exceeds 1000 pounds (454 kg). Lifting equipment is required when handling rolls to avoid injury.

**Application Temperature.** 72 °F (22 °C) minimum

**Protective Blue Liner.** To prevent scratching or marking the Product's reflective surface, do not remove the protective liner until all fabrication and installation processes are finished, and the Product is no longer exposed to dust, debris, water, or physical contact. When ready, carefully remove the protective liner.

**Protect from Abrasion During Use.** To further prevent scratching or marking the Product's reflective surface, do not expose to abrasive environments.

**Lamination.** This Product can be applied with a roll laminator. Use a dry application method only. Keep the protective liner on the Product during the entire lamination process.

### Transportation and Storage

- 40 °F - 90 °F (4 °C - 32 °C)
- Away from direct sunlight and high humidity
- Clean dry area
- Original container with end caps, in the plastic sleeve, stored horizontally, maximum of 6 cartons high
- Bring the Product to room temperature before application
- Install Product within 2 years from date of purchase as long as the above conditions are met.

### Cleaning and Maintenance

**SFP-D50A** - Use care when cleaning the applied SFP-D50A. Its abrasion resistant coating cannot withstand heavy contact. Repeated cleaning could lead to scratches over a period of time.

To clean light smudges and fingerprints from the applied SFP-D50A, use a standard household window glass cleaner and/or non-abrasive lens cleaning tissue. Use a very light circular motion.

**SFP-D50F** - Do not attempt to dust or clean SFP-D50F once the protective liner is removed.

## Health and Safety



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 sheets for 3M products go to [3M.com/SDS](http://3M.com/SDS), or by mail or in case of an emergency, call 1-888-364-3577 or 1-651-737-6501.

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

## Technical Information

Technical information and data, recommendations, and other statements provided by 3M are based on information, tests, or experience which 3M believes to be reliable, but the accuracy or completeness of such information is not guaranteed. Such technical information and data are intended for persons with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. The typical values shown should not be used for the purpose of specification limits. If you have questions about this Product, contact the Technical Service helpline at 1-888-650-3497.

For more information or to order samples, please visit [3M.com/AMD](http://3M.com/AMD).

## Warranty

Please refer to the applicable product's technical data sheet for warranty information.

## Change History

### Rev B (17-SEPT-2015):

- Updated document formatting
- Added new standard sections per new template (Health and Safety, Technical Information, Change History)

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