



### Product Description

3M™ DICHROIC™ Glass Finishes DF-PA (the “Products”) offer a way to create unique, ever-changing color on many interior and exterior building glass surfaces. Influenced by the color of the substrate, these transparent Products provide a dichroic color effect, meaning they appear to change color when viewed at various angles. The “Blaze” Product shifts colors in the warm tones of cyan/blue/magenta in transmission and red/gold color regions of the spectrum in reflection. The “Chill” Product shifts colors in the cool tones of blue/magenta/yellow in transmission and gold/green/blue color regions of the spectrum in reflection.

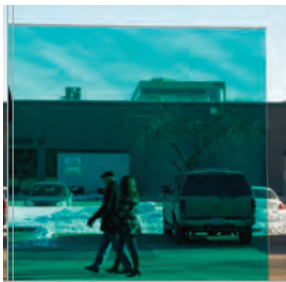
- The Products have a clear, pressure-sensitive adhesive that can be applied to glass. A hard-coated, protective surface layer helps resist scratching during normal use.
- The Products can be used in applications on the surface of interior glass, interior perimeter glass (the “Interior Applications”), and vertical exterior glass (the “Exterior Applications”).

### **i** IMPORTANT NOTE

Please refer to the 3M™ DICHROIC™ DF-PA Installation Guide for additional information on wet application.

### Featured Benefits

- Create dynamic, color-shifting appearance in cool or warm tones influenced by the environment
- Transparent dichroic color effect changes color when viewed from different angles
- Easy application - wet application method of DF-PA virtually eliminates air bubbles, simplifying and speeding up application
- Expected Performance Life of 10 years for interior applications on non-perimeter glass, 7 years for interior perimeter glass, 5 years for vertical exterior glass (see Warranty).



**Blaze Product: Cyan/Blue/Magenta in transmission at various angles**



**Chill Product: Blue/Magenta/Yellow in transmission at various angles**

## Product Characteristics

The values in these tables are typical, and are based on test data deemed reliable, but are not warranted.

Characteristic		DF-PA Blaze	DF-PA Chill
Material	Protective Layer	Hard-coated Polyester	
	Base Film	Multi-layer Polymeric	
	Adhesive	Pressure-sensitive acrylic, permanent	
	Release Liner	Silicone-coated polyester	
Thickness	Film + Adhesive	5.2 mils (132 microns) without Release Liner	5.0 mils (127 microns) without Release Liner
	Release Liner	3.5 mils (89 microns)	
Maximum Roll Size		48 in. X 98.4 ft. (1220mm x 30m)	
Maximum Weight		35 lb. (15.9 kg) per roll	
Film Color		Cyan/Blue/Magenta in transmission Red/Gold in reflection	Blue/Magenta/Yellow in transmission Gold/Green/Blue in reflection

**NOTE:** Product appearance has an inherent variation in color uniformity as it shifts from one color to the next, including slight color variation across the roll. Product from the same lot of material should be used for each installation location.

## Product Performance

The values in these tables are typical, and are based on test data deemed reliable, but are not warranted.

Characteristic	DF-PA Blaze	DF-PA Chill
Adhesion 24 hours after application *	Glass 7 lb./in. (33 N/25mm) Acrylic 5 lb./in. (23 N/25mm) Polycarbonate 3 lb./in. (13 N/25mm)	
Fire Resistance	When used in Interior Applications on glass, Products have Class A per ASTM E84 (as defined in NFPA 101 "Life Safety Code").	

\* Test specimens were applied to the substrate and conditioned at 68 F (20 C), then peel tested at 180 degree at a tensile speed of 12 inches (300 mm) per minute.

## Optical Performance Characteristics

The optical values are calculated as theoretical values and compiled with existing data. The values in these tables are typical, and are based on test data deemed reliable but are not warranted.

Characteristic	DF-PA Blaze	DF-PA Chill	
Transmissive Color <sup>1</sup>	Cyan/Blue/ Magenta	Blue/Magenta/ Yellow	
Reflective Color <sup>1</sup>	Red/Gold	Gold/Green/Blue	
Spectral Data <sup>2</sup> Left Band Edges Right Band Edges	590nm 795nm	500nm 615nm	
Shading Coefficient*	0.70	0.77	
Solar Heat (%)	Reflectance*	25	21
	Transmittance*	57	62
	Absorbance*	13	15
Visible Light (%)	Reflectance*	22	78
	Transmittance*	77	17
UV (%)	Transmittance*	2.6	2.4

1. Varies by viewing angle. Color shift is visible from both sides of the Product.

2. ASTM Test: E1164-94 / E387-95

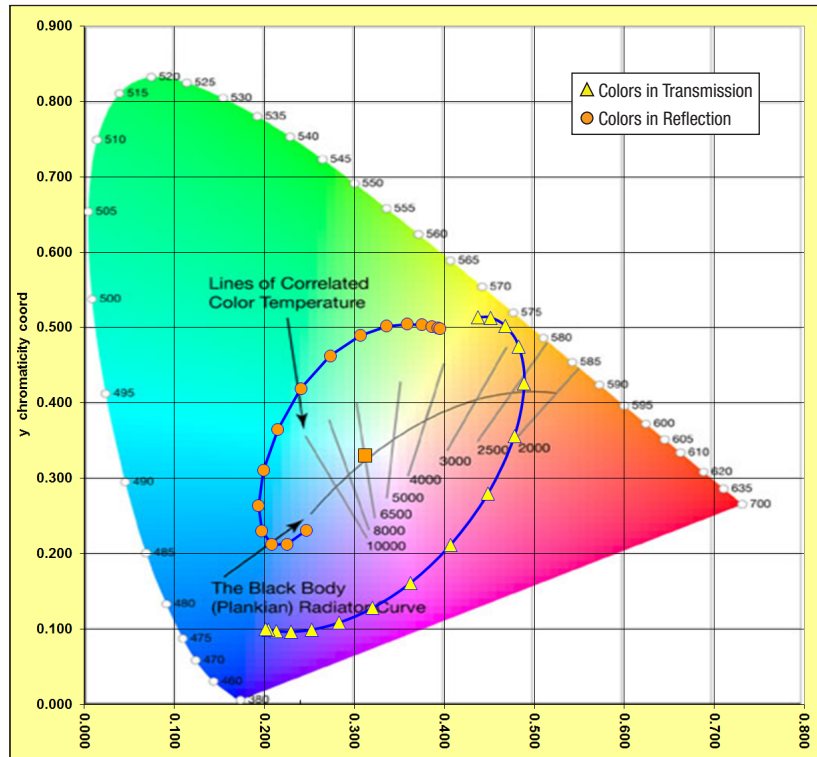
\* As measured on 6 mm clear glass.

## Resistance to Cleaners and Disinfectants

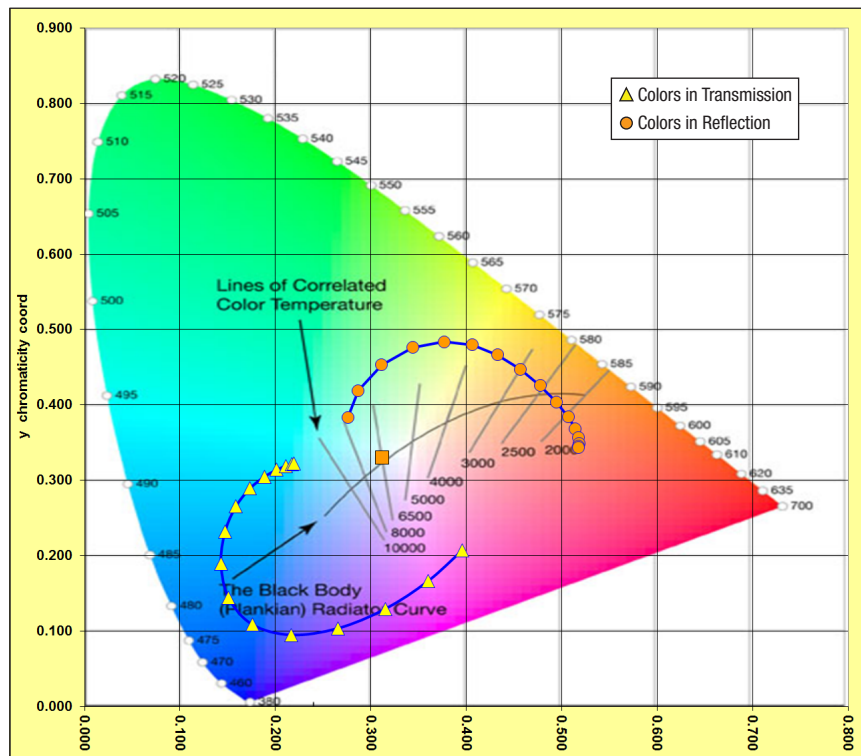
Glass finishes are wet applied to glass and allowed to dry for at least 48 hours. For wipe testing, the cleaner or disinfectant is applied to the sample to simulate routine use in a healthcare setting, and then wiped off with a cloth. For immersion testing, the sample is immersed in the cleaner or disinfectant for 10 minutes or up to 24 hours, then rinsed with water and allowed to dry. Any change in the surface of the glass finish is noted. Other cleaners and disinfectants with the same active ingredient are expected to perform similarly.

Cleaner or Disinfectant	Wipe Testing Result	Immersion Time	Immersion Testing Result
3M™ C. diff Solution Tablets Concentrate	No visible change	24 hours	No visible change
3M™ HB Quat Disinfectant Cleaner Concentrate #25A	No visible change	24 hours	No visible change
3M™ Neutral Quat Disinfectant Cleaner Concentrate # 23	No visible change	24 hours	No visible change
Isopropyl Alcohol – 70% IPA/30% water	No visible change	24 hours	No visible change
3M™ MBS Cleaner Concentrate #41	No visible change	24 hours	No visible change
3M™ Quat Disinfectant Cleaner Concentrate #5A	No visible change	24 hours	No visible change
3M™ RCT Disinfectant Cleaner Concentrate #40A	No visible change	24 hours	No visible change
Clorox® Bleach - 50% bleach/50% water	No visible change	24 hours	No visible change

Typical Spectral Response for DF-PA Chill Product, measured across different angles



Typical Spectral Response for DF-PA Blaze Product, measured at different angles



## Product Use

The user is solely responsible for evaluating and determining whether these 3M Products are suitable and appropriate for any particular use or manufacturing process in which they may be used.

**NOTE:** 3M™ DICHROIC™ Film DF Blaze and Chill Products are intended for general decoration and are different from the DF-PA Products. DF Film Products are not intended for application to glass or between glass, or where UV or abrasion resistance is needed. (See technical data sheet for 3M DICHROIC™ Film DF Blaze and Chill)

## Application and Removal Guidelines

Avoid scratching, denting, or stretching the Product during installation.

The values in these tables are typical, and are based on test data deemed reliable but are not warranted. See the 3M DICHROIC™ DF-PA Glass Finishes Installation Guide for additional information.

Characteristic	DF-PA Blaze & Chill
Application Surface Type	Flat
Application Surface Material	Glass, acrylic, polycarbonate
Application Location	Interior Applications, including interior perimeter glass; exterior applications
Application Temperature	54°F - 100°F (12°C - 38°C) air and application surface
Application Method	Wet application
Applied Product Shrinkage	Nominal
Applied Product Exposure Temperature	-40 °F to +149 °F (-40 °C to +65 °C)
High Humidity Environments	Products are not recommended for Interior Applications where condensation consistently occurs.
Product Removal	Low heat, or 3M Adhesive Remover Citrus Base and scraper

**NOTE:** Removing the Product too quickly can result in excessive adhesive left on the substrate. If necessary, heat a small section of the film with a hair dryer to soften the adhesive, peel back slowly, then heat and remove the next section.

## Processing Options

### Printing

The DF-PA Product is not designed for printing on the surface. If the customer chooses to print on the Product, the customer must test and approve with their equipment to determine suitability.

### Electronic Cutting

The DF-PA Product is believed to be suitable for use with most electronic cutting equipment, but the customer must test and approve with their equipment to determine suitability.

## Shelf Life and Storage

### Shelf Life

Apply the Products within 2 years of the date of purchase. The storage conditions specified in this document must be maintained for full shelf life.

### Storage Conditions

- 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, a maximum of 6 cartons high
- Bring the Product to room temperature before application

## Cleaning and Maintenance

**NOTE:** The DF-PA Product may be cleaned beginning 30 days after installation.

Regular cleaning will help maintain the Product's appearance. Use only clean, nick-free tools and wipe gently only in one direction. Do not use ammonia, chlorine, or organic-based cleaning products, polishing or cleaning compound, sponges, brushes or electric polishing equipment.

- If there is dust and grit, wipe it off with a soft, damp cloth.
- If it is soiled, but not gritty, use water and squeegee.
- If there is heavier soil, use a mild liquid detergent and water solution, then clear water, and wipe gently with a cloth.
- Use spray window cleaning products only if needed for stubborn soil. Spray, then wipe gently with a cloth. Then rinse with clean water and wipe gently with a cloth. Acceptable window cleaners for occasional use are 3MTM Glass Cleaner and Protector Concentrate #17, Windex® Original Glass Cleaner, Sprayway® Glass Cleaner Foaming Aerosol Spray, and 10% Isopropyl Alcohol in 90% water.

## 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 sheets for 3M products go to [3M.com/SDS](https://www.3m.com/SDS), or by mail or in case of an emergency, call 1-800-364-3577 or 1-651-737-6501.

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

### WARNING

#### **To reduce the risks of personal injury and/or property damage associated with glass breakage:**

A glass surface covered by a film with areas of high opacity or dark-colored ink will absorb more heat than other glass surfaces when exposed to sunlight. Heat absorption can create thermal expansion that could result in glass breakage or cracking. Do not use a film with areas of high opacity or dark-colored ink on glass surfaces with significant exposure to sunlight.

## 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.

## LEEDv4 Credits

This section describes some of the options for acquiring LEED credits using 3M™ DICHROIC™ Glass Finishes DF-PA.

**NOTE:** Each application is different. It is the sole responsibility of the end user to evaluate and determine whether LEED credits can be acquired.

### ID+C MR Credit, Interiors Life-Cycle Impact Reduction

- Option 1: Interior Reuse - Product can be used to refinish salvaged, refurbished, or reused building materials

### ID+C, BD+C EQ Credit, Low-Emitting Materials

- Product has been tested to and is in compliance with the General Emissions Evaluation (California Department of Public Health (CDPH) Standard Method V1.1-2010)

### ID+C, BD+C EQ Credit, Daylight

- Product can be used to enable daylight in enclosed spaces

### BD+C MR Credit, Building Life-Cycle Impact Reduction

- Option 3: Building and Material Reuse - Product can be used to refinish salvaged, refurbished, or reused building materials

### O+M MR Credit, Purchasing - Facility Maintenance and Renovation

- Product can be used to refinish salvaged, refurbished, or reused building materials
- Product has been tested to and is in compliance with the General Emissions Evaluation (California Department of Public Health (CDPH) Standard Method V1.1-2010)

## BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION INFORMATION

### Environmental Product Declaration (EPD) or Life Cycle Analysis (LCA)

EPD and/or LCA information not available.

### Raw Material Source and Extraction Reporting

Raw Material source and extraction information for this product is considered to be 3M confidential and is therefore not available.

### Extended Producer Responsibility

Take-back or recycling program for this product is not available.

### Bio-based Materials

Product has not been tested to ASTM D6866.

### Wood Products

Product does not contain wood-based materials.

### Materials Reuse

Product can be used to refinish salvaged, refurbished, or reused building materials.

### Recycled Content

Product does not contain pre- or post-consumer recycled content.

## WARRANTY

### Products

3M™ DICHROIC™ Glass Finishes DF-PA Chill and DF-PA Blaze (the “Products”).

### 3M Basic Product Warranty

The Product(s) specified in this document are warranted to be free of defects in materials and manufacture (“3M Basic Product Warranty”) at the time of shipment (“Warranty Period”) by 3M or its authorized distributor.

### Limited Warranty

- For Products used in Interior Applications or Exterior Applications in the continental United States, 3M makes the following warranty (the “3M Limited Warranty”) for the applicable time period stated below (“Warranty Period”), which will begin on the earlier of: (a) Product installation date; or (b) six months after 3M’s Product shipment date.

The Product(s) will maintain their color changing properties and will have no significant discoloration, cracking or other similar visual defects for the applicable time period below:

DF-PA Application		Warranty Period - Vertical Applications
Interior Applications	Excluding building perimeter glass	7 years
	Building perimeter glass	5 years
Exterior Application - Vertical Glass		5 years
Plastic application surfaces		Not warranted

- For a buyer’s convenience, 3M may provide engineering or technical information, recommendations, installation instructions, and other information or materials relating to Product (“Other Product Information”), but 3M makes only the 3M Basic Product Warranty and the 3M Limited Warranty and does not warrant any Other Product Information.
- 3M has no obligation under the 3M Basic Product Warranty or the 3M Limited Warranty as to Product that has been: (a) modified, altered or processed in any manner; (b) stored, applied, installed, or used in a manner other than that 3M recommends in this document and in all Other Product Information; (c) damaged through contact with a person or thing, misuse, accident, neglect, or other action by anyone other than 3M; (d) improperly installed, including, without limitation, installation after the expiration the Product’s shelf life or installation without proper surface preparation, or (e) exposed to excessive heat, humidity, dirt or UV light.
- EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, THE 3M BASIC PRODUCT WARRANTY AND 3M LIMITED WARRANTY ARE MADE IN LIEU OF ALL OTHER WARRANTIES, RIGHTS OR CONDITIONS, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY, SATISFACTORY QUALITY, FITNESS FOR A PARTICULAR PURPOSE AND THOSE ARISING FROM A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. THE BUYER IS RESPONSIBLE FOR DETERMINING IF A PRODUCT IS SUITABLE FOR ITS PARTICULAR PURPOSE AND ITS APPLICATION METHODS.
- 3M must receive any 3M Basic Product Warranty or 3M Limited Warranty claim in writing no later than 10 business days after (a) the end of the Warranty Period or (b) the discovery of the 3M Warranty claim, whichever is earlier.



## WARRANTY (continued)

### Limited Remedy

IF ANY PRODUCT IS PROVEN NOT TO HAVE MET THE 3M BASIC PRODUCT WARRANTY OR THE 3M LIMITED WARRANTY DURING THE WARRANTY PERIOD, THEN THE BUYER'S EXCLUSIVE REMEDY, AND 3M'S SOLE OBLIGATION, WILL BE, AT 3M'S OPTION, TO REPLACE THE NONCONFORMING PRODUCT OR TO REFUND THE NONCONFORMING PRODUCT'S PURCHASE PRICE.

### No Extension of Warranty

In the case of an approved warranty claim, the replacement Product will carry only the remaining term of the original warranty period.

### Limitation of Liability

3M WILL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO A BUYER FOR DIRECT (other than the Limited Remedy stated above), SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS) IN ANY WAY RELATED TO THE PRODUCT, THE TECH DATA SHEET OR OTHER PRODUCT INFORMATION, REGARDLESS OF THE LEGAL OR EQUITABLE THEORY ON WHICH SUCH DAMAGES ARE SOUGHT.

### Commercial Solutions

3M Center, Building 220-12E-04  
St. Paul, MN 55144

1-800-328-3908  
3M.com/Graphics



800-295-8468

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