

### Product Description

3M DICHROIC DF (the “Product”) is a non-adhesive transparent film that provides a dichroic color effect, meaning it appears 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/blue color regions of the spectrum in reflection. The brilliant color shift is visible from both sides of the Products and is influenced by the environment in which the Products are used, including the lighting, the viewing angle, and the mounting surface color. The Products are a premium grade, multi-layer polymeric film that is non-metallic, non-conductive, and non-corrosive.

### Product Characteristics

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

Characteristic	DF Blaze	DF Chill
<b>Material</b>	Polyester surface layers with alternating layers of polyester and acrylic	
<b>Thickness</b>	1.3 mils (33 microns)	1.15 mils (29 microns)
<b>Roll Sizes - DF Products</b>	28 in. x 30 yds. (710mm x 27.4m) 56 in. x 30 yds. (1420mm x 27.4m)	
<b>Film Color</b>	Cyan/Blue/Magenta in transmission Red/Gold in reflection	Blue/Magenta/Yellow in transmission Gold/Blue in reflection

### Optical Performance Characteristics

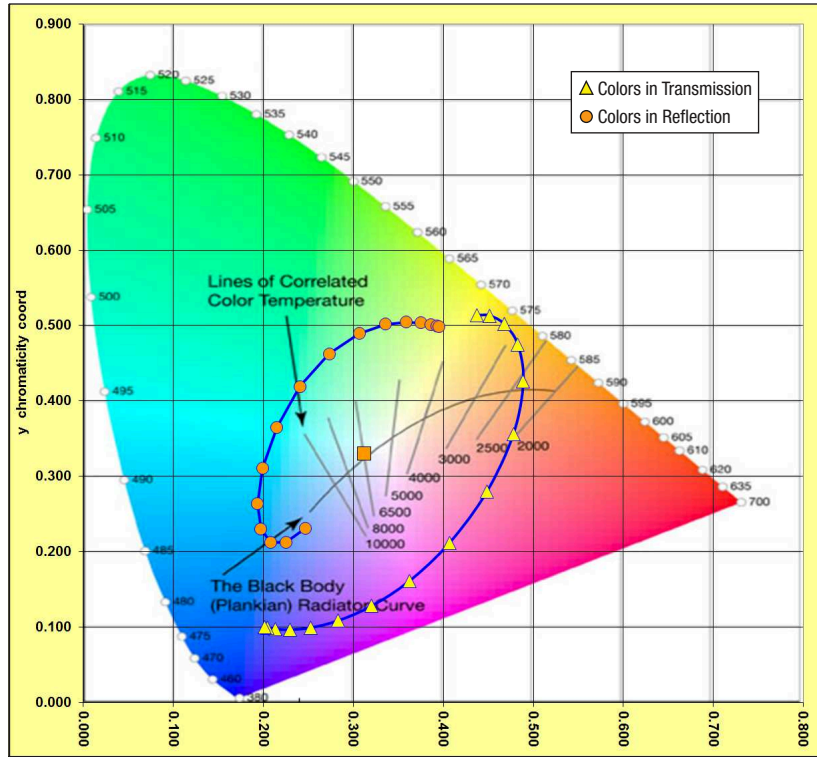
The optical data are calculated as theoretical values and compiled with existing data. The values in these tables are typical, and are based on test data deemed reliable but are not warranted.

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

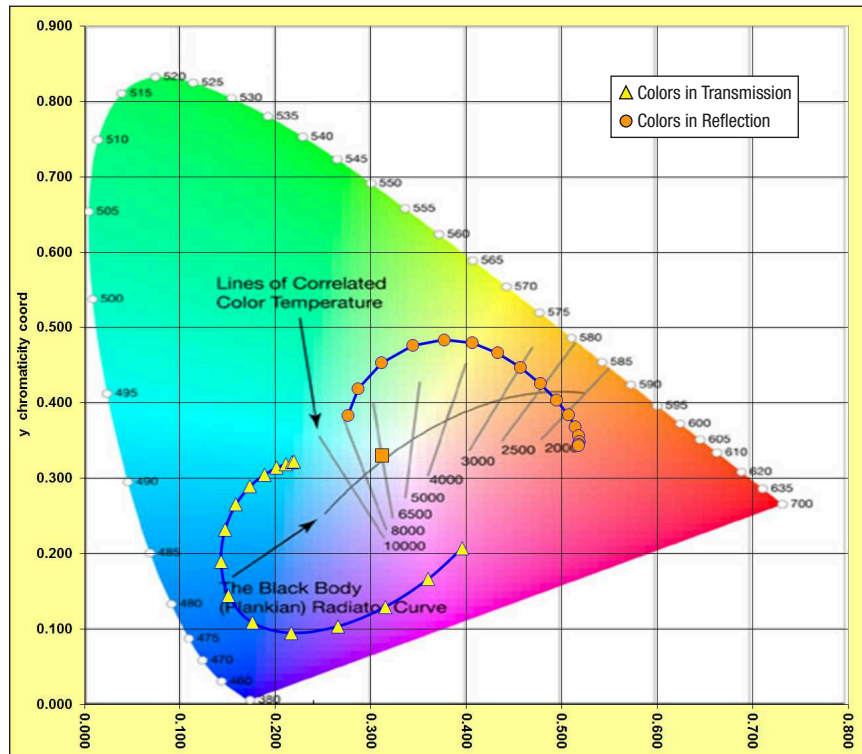
1. Varies by viewing angle. Color shift is visible from both sides of the Product.

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

Typical Spectral Response for DF Chill Product



Typical Spectral Response for DF Blaze Product



## Product Use

3M DICHROIC DF Products are intended for general decoration. They are not intended for use where UV or abrasion resistance is needed, such as on perimeter glass or conference room glass. 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.

## Environmental Performance

These Products are not recommended for exterior use. Protection from UV radiation wavelengths is required.

Abrasion and scratch resistance is similar to other products made of polyester. To maximize product effectiveness:

- use it in a location where it can be protected from abrasion.
- apply a hard coat lamination to help protect from abrasion.

Avoid contact with aromatic hydrocarbons and chlorinated hydrocarbons, which can damage the Product.

## Application Guidelines

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

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

Characteristic	Value
Application Location	Interior Applications
Applied Product Exposure Temperature	-40 °F - +149 °F (-40 °C - +65 °C)
High Humidity Environments	Products are not recommended for Interior Applications where condensation consistently occurs.

## Processing Options

The customer must test and approve the Products for use in each application, including the following:

- Laminate
- Emboss
- Die cut
- Surface treat
- Coat to be heat-sealed
- Coat with adhesive
- Mold into plastic
- Thermoform

## Shelf Life and Storage

### Shelf Life

Apply the Product 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:** Use caution to avoid scratching the Product during cleaning.

Cleaning depends on the customer application. 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 a cloth.
- If there is heavier soil, use a mild liquid detergent and water solution, then clear water, and wipe gently with a cloth wipe.

## 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](http://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: Risk of Glass Breakage Due to Thermal Expansion**

Glass surfaces exposed to sunlight will absorb heat. A glass surface covered by a film with high opacity or dark-colored ink, including films with small areas of high opacity or dark-colored ink, will absorb more heat. Heat absorption can create thermal stress that results in glass breakage, or thermal cracking. This can cause personal injury and property damage. 3M specifically does not recommend using a film with 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.

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

## Change History

### **Rev E (15-SEPT-2015):**

- Updated Shelf Life and Storage section
- Updated warranty with 3M Basic Product Warranty section language
- Added revision and doc type to footers

### **Rev D (23-JUN-2015):**

- Updated warranty with 3M Basic Product Warranty section language.
- Added revision and doc type to footers.

## WARRANTY

### Product

3M DICHROIC Films DF Chill & DF Blaze (the “Product(s)”).

### 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

1. For the Product(s) specified in this document, 3M makes the 3M Basic Product Warranty only.
2. For a buyer’s convenience, 3M may provide engineering or technical information, recommendations, installation instructions or guides, and other information or materials relating to a Product (“Other Product Information”), but 3M makes only the 3M Basic Product Warranty and does not warrant any Other Product Information.
3. 3M has no obligation under the 3M Basic Product 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.
4. EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, THE 3M BASIC PRODUCT WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, RIGHTS OR CONDITIONS, EXPRESS OR IMPLIED, 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 APPLICATION METHODS.

5. 3M must receive any 3M Basic Product 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.

### Limited Remedy

If any Product is proven not to have met the 3M Warranty on the buyer’s receipt, then the buyer’s exclusive remedy, and 3M’s sole obligation, will be, at 3M’s option, to replace that Product quantity or refund the applicable purchase price.

### 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 A PRODUCT, THIS PRODUCT BULLETIN/TECHNICAL DATA SHEET, OR OTHER PRODUCT INFORMATION, REGARDLESS OF THE LEGAL OR EQUITABLE THEORY ON WHICH SUCH DAMAGES ARE SOUGHT.

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