

# 3M™ Contrast Enhancement Film

## CEF0605 • CEF0606 • CEF0607 • CEF0608 • CEF0609 • CEF0610

### 3M™ Contrast Enhancement Film CEF06XX:

3M CEF06XX is bare ITO compatible and outgassing resistant. It is commonly used in gap filling and other applications requiring an optically clear bond.

### Construction

Products	3M™ Contrast Enhancement Film					
	CEF0605	CEF0606	CEF0607	CEF0608	CEF0609	CEF0610
<b>Adhesive Type:</b>	Acrylic	Acrylic	Acrylic	Acrylic	Acrylic	Acrylic
<b>Adhesive Carrier:</b>	None	None	None	None	None	None
<b>Approximate Thickness:</b>						
<b>Release Liner</b>	3.0 mil (75 micron) Clear Polyester	3.0 mil (75 micron) Clear Polyester	3.0 mil (75 micron) Clear Polyester	3.0 mil (75 micron) Clear Polyester	3.0 mil (75 micron) Clear Polyester	3.0 mil (75 micron) Clear Polyester
<b>Adhesive</b>	5.0 mil (125 micron)	6.0 mil (150 micron)	7.0 mil (175 micron)	8.0 mil (200 micron)	9.0 mil (225 micron)	10.0 mil (250 micron)
<b>Release Liner</b>	3.0 mil (75 micron) Clear Polyester	3.0 mil (75 micron) Clear Polyester	3.0 mil (75 micron) Clear Polyester	3.0 mil (75 micron) Clear Polyester	3.0 mil (75 micron) Clear Polyester	3.0 mil (75 micron) Clear Polyester

### Typical Physical Properties and Performance Characteristics

**Note:** The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

#### Refractive Index:

Abe Refractometer

3M™ Contrast Enhancement Film  
CEF06XX

1.48

#### Haze:

Haze was measured according to ASTM D1003-92.

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0.8%



## Typical Physical Properties and Performance Characteristics (continued)

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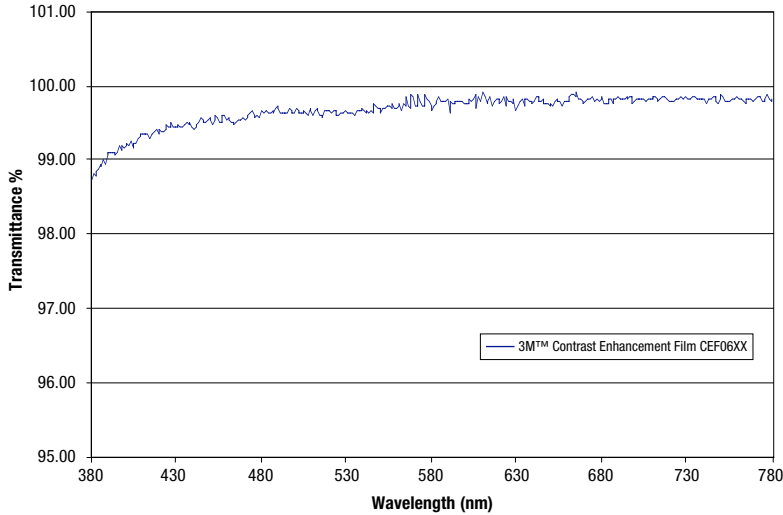
### Transmission:

ASTM E903, D1003, and E284

Reflective-Corrected Total Luminous

Transmission vs. Wavelength

### 3M™ Contrast Enhancement Film CEF06XX



### Color:

ASTM-E1164-07 / CIELAB

(BYK Gardner TCS Plus spectrophotometer, model 8870)

### 3M™ Contrast Enhancement Film CEF06XX

$L^* = 96.96$

$a^* = -0.06$

$b^* = 0.35$

### Peel Adhesion:

ASTM D3330 modified, 180° peel, 12 in/min, 2 mil polyester backing. Units: Oz/in

	Float Glass				PC				PMMA				PET			
	20 minute dwell		3 days dwell		20 minute dwell		3 days dwell		20 minute dwell		3 days dwell		20 minute dwell		3 days dwell	
Units	Oz/in	N/100mm	Oz/in	N/100mm	Oz/in	N/100mm	Oz/in	N/100mm	Oz/in	N/100mm	Oz/in	N/100mm	Oz/in	N/100mm	Oz/in	N/100mm
CEF0605	81	88	92	101	70	76	98	108	72	79	76	83	65	71	68	75
CEF0606	82	90	92	101	64	70	101	111	72	79	75	82	65	72	71	77
CEF0607	88	97	96	105	86	94	107	117	75	82	79	86	71	78	74	81
CEF0608	94	103	101	111	90	98	111	121	78	85	81	89	76	83	76	83
CEF0609	95	104	107	117	90	99	117	128	78	85	84	92	81	89	77	85
CEF0610	91	99	109	119	87	95	122	133	82	90	86	95	79	86	82	90

## Typical Physical Properties and Performance Characteristics (continued)

**Note:** The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

### Durability:

3M™ Contrast Enhancement Films CEF06XX are laminated between two different substrates and subjected to high temperature/ humidity condition for 3 days.

Substrate Configuration	60°C / 90% RH
PMMA (1mm) - Glass (1mm)	Pass
PC (1mm) - Glass (1mm)	Pass
PMMA (1mm) - Polarizer on glass	Pass
PC (1mm) - Polarizer on glass	Pass

\*Pass – No visual defect due to aging including bubbles, delamination or blisters.

### Typical Electrical Properties of 3M™ Contrast Enhancement Film CEF06XX at 25°C and 1 KHz.

ASTM-D150-92

Product	Dielectric Constant	Tan (Delta)
CEF06XX	5.2	0.0377

### Shelf Life:

Product retains its performance and properties for two years from date of manufacture if properly stored at room temperature conditions of 72°F (22°C) and 50 relative humidity. Storage in plastic bag is recommended.

## Available Sizes

Available in die cut pieces only.

## Application Techniques

For maximum bond strength the surface should be thoroughly cleaned and dried. To obtain greatest benefit, laminations should be done in a class 10,000 cleanroom or better and using equipment with static charge elimination.

Bond strength can be improved with firm application pressure and moderate heat causing the adhesive to develop intimate contact with the bonding surface.

## General Information

- Light transmission >99% when corrected for reflection losses.
- Haze level < 2% for 3M™ Contrast Enhancement Film CEF06XX.
- Can be used with bare ITO.
- Non-whitening at high temperature/humidity.
- Enhanced durability on outgassing substrates (PC, PMMA).
- High temperature, humidity, and UV resistance.
- Long term durability without yellowing, delaminating, or degrading.
- High cohesive and peel strength for reliably bonding most transparent substrates.
- 3M™ Contrast Enhancement Film CEF06XX is coated and converted in a clean room.
- 3M™ Contrast Enhancement Films are inspected to reduce the occurrence of bubbles, dirt, gels and other optical distortions.
- Wound on plastic cores and wrapped in plastic to eliminate paper fiber contamination.
- Two film liners for optimum adhesive smoothness and differential release for ease of processing and protection from contamination.

## Application Ideas

- Touchscreens- for bonding film and glass laminates.
- Transparent graphic overlays.
- Projection screens.
- Avionics/military displays.
- Optical management films for LCD.

### **Processing:**

#### **Laminating**

Hand lamination not advised. Use best process control standards possible to control variables. (See **3M Laminating Technical Bulletin** for additional information.)

#### **Die-cutting**

Use high precision, tight tolerance tooling designed to cleanly cut film and pressure-sensitive adhesive.

## Certification/Recognition

**MSDS:** 3M has not prepared a MSDS for these products which are not subject to the MSDS requirements of the Occupational Safety and Health Administration's Hazard Communication Standard, 29 C.F.R. 1910.1200(b)(6)(v). When used under reasonable conditions or in accordance with the 3M directions for use, these products should not present a health and safety hazard. However, use or processing of the products in a manner not in accordance with the directions for use may affect their performance and present potential health and safety hazards.

**TSCA:** These products are defined as an article under the Toxic Substances Control Act and therefore, are exempt from inventory listing requirements.

**RoHs Complaint/REACH Compliant:** These products comply with the European Union's "Restriction of Hazardous Substances" (RoHs) initiative and with European REACH regulations 2002/95/EC and 2005/618/EC.

## For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-866-599-4227. Address correspondence to: 3M, Electronics Markets Materials Division, 3M Center, Building 225-3S-06, St. Paul, MN 55144-1000. Our fax number is 651-778-4244 or 1-877-369-2923. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-787-750-3000. In Mexico, phone: 52-70-04-00.

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