

## 3M™ Contrast Enhancement Film (CEF35XX/OCA 8F35-X Series)

- 3M film CEF35006/3M OCA 8F35-0.6
- 3M film CEF3501/3M OCA 8F35-1
- 3M film CEF35014/3M OCA 8F35-1.4
- 3M film CEF3502/3M OCA 8F35-2
- 3M film CEF3504/3M OCA 8F35-4



### Product Description

3M™ Contrast Enhancement Film (CEF35XX/OCA 8F35-X Series) offers higher adhesion, especially at elevated temperatures, with a low modulus over a broad temperature range to enable shear decoupling. It is elastic to aid quick recovery after folding. 3M film CEF35XX/3M OCA 8F35-X can be laminated via the conventional film Optically Clear Adhesive (OCA) lamination process. No Ultraviolet (UV) curing required.

### Key Features

- Low modulus over a broad temperature range
- Elasticity for quick recovery after folding
- 3M film CEF35XX Series products are die cuts of film
- 3M OCA 8F35-X Series products are available in roll good form

### Product Construction

Product	3M™ film CEF35006 (OCA 8F35-0.6)	3M™ film CEF3501 (OCA 8F35-1)	3M™ film CEF35014 (OCA 8F35-1.4)	3M™ film CEF3502 (OCA 8F35-2)	3M™ film CEF3504 (OCA 8F35-4)
<b>Adhesive Type:</b>	Acrylic	Acrylic	Acrylic	Acrylic	Acrylic
<b>Adhesive Carrier:</b>	None	None	None	None	None
<b>Approximate Thickness:</b>					
<b>Release Liner:</b>	50 µm (2.0 mils) Clear Polyester	75 µm (3.0 mils) Clear Polyester	75 µm (3.0 mils) Clear Polyester	75 µm (3.0 mils) Clear Polyester	75 µm (3.0 mils) Clear Polyester
<b>Adhesive:</b>	15 µm (0.6 mils)	25 µm (1.0 mils)	35 µm (1.4 mils)	50 µm (3.0 mils)	100 µm (4.0 mils)
<b>Release Liner:</b>	50 µm (2.0 mils) Clear Polyester	75 µm (3.0 mils) Clear Polyester	75 µm (3.0 mils) Clear Polyester	125 µm (5.0 mils) Clear Polyester	75 µm (3.0 mils) Clear Polyester

The 3M family of optically clear adhesives for electronic displays are usually available in two forms. 3M OCA come in roll good form. 3M Contrast Enhancement Films (CEF) are available in die-cut form.

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### 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.

#### Environmental Testing:

The following environmental tests were conducted in the 3M laboratory under the conditions specified without any appreciable deterioration in visible appearance (no bubbles, delamination, etc.). Sample construction is optical-glass/3M film CEF35XX/ optical glass.

	Condition	Duration
High Temperature	+95°C	1000 hours
Low Temperature	-40°C	1000 hours
High Temp/Humidity	+65°C/95%RH	1000 hours
Thermal Shock	-40°C and +95°C (1 hour dwell, <1 min ramp time)	100 cycles

#### Peel Adhesion:

ASTM D3330 modified, 180 degree peel from glass, 1 cm wide peel strips, 12in/min (305 mm/min), 2.0 mil polyester backing, 3M film CEF35XX Series.

Peel Adhesion to Glass		
Dwell Time	20 min dwell at 25°C/50%RH	1 day dwell at 25°C/50%RH
Units	N/cm	N/cm
3M film CEF3501	1.4	2.4
3M film CEF3502	1.5	2.4

#### Color:

Ultra Scan Pro (Hunter Lab), ASTM E308, D65/10° 3M film CEF35XX Series on optical glass.

3M™ film CEF3501	3M™ film CEF3502	3M™ film CEF3504
L* = 97.0	L* = 97.0	L* = 97.0
a* = -0.02	a* = -0.02	a* = -0.02
b* = 0.17	b* = 0.18	b* = 0.19

#### Refractive Index:

(+ 0.0005 from standard deviation of ellipsometry) 3M film CEF35XX Series

3M™ film CEF35XX Series		
405 nm	532 nm	633 nm
1.4840	1.4728	1.4681

## 3M™ Contrast Enhancement Film (CEF35XX/OCA 8F35-X Series)

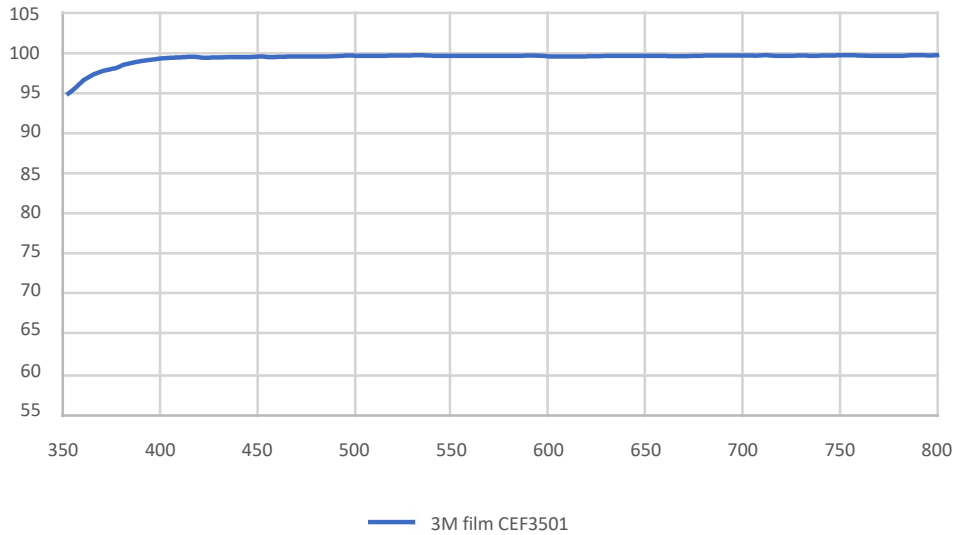
### Haze:

Haze is measured according to ASTM D1003-92, 3M film CEF35XX Series on optical glass

3M™ film CEF3501	3M™ film CEF3502	3M™ film CEF3504
0.1%	0.1%	0.1%

### Transmission Curve:

Transmission vs. Wavelength (Corrected for Reflection Loss) for 3M film CEF35XX Series on Glass



### Typical Electrical Properties at Room Temperature:

ASTM-D150-92. 3M film CEF35XX Series

### Dielectric Constant:

3M™ film CEF35XX Series	
Frequency (kHz)	Dielectric Constant
100	5.44
500	5.22

## 3M™ Contrast Enhancement Film (CEF35XX/OCA 8F35-X Series)

### Suggested Lamination Process

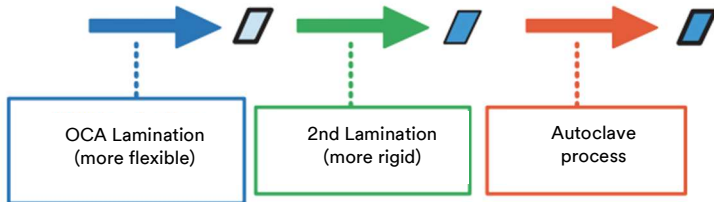
**Step 1:** Remove secondary liner, and then laminate 3M film CEF35XX to first adherent substrate by roller at room temperature

Recommendation: roller pressure 0.1 – 0.2 MPa, roller speed 0.5 – 1 m/min

**Step 2:** Remove primary liner, and then laminate 3M film CEF35XX/first adherent to second adherent by vacuum lamination (if rigid-to-rigid bonding)

Recommendation: Vacuum condition < 50 Pa, pressure around 0.1 – 0.2 MPa

**Step 3:** Autoclave process recommendation: 30-60°C/3-5kgf/cm<sup>2</sup>/20-30min



### Storage

- Avoid applying pressure or resting objects on the product to prevent marking, denting, or deforming the surface.
- Wear gloves to prevent fingerprints or nail marks when handling.
- Product needs to be unpacked and handled in a clean-room facility.
- Store in sealed bag at 25°C or below.

**Regulatory:** For regulatory information about this product, contact your 3M representative.

## **3M™ Contrast Enhancement Film (CEF35XX/OCA 8F35-X Series)**

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