

3M™ Contrast Enhancement Film (OCA 8F50-X/CEF50XX Series)

- 3M OCA 8F50-3/3M film CEF5003
- 3M OCA 8F50-4/3M film CEF5004
- 3M OCA 8F50-5/3M film CEF5005
- 3M OCA 8F50-6/3M film CEF5006



Product Description

3M™ Contrast Enhancement Film (OCA 8F50-X/CEF50XX Series) are specialized optically clear adhesives offering excellent clarity and adhesion to various transparent display substrates. 3M OCA 8F50-X is a UV curable type OCA designed for 2D OLED applications, suitable for both rigid and flexible OLED panels. 3M OCA 8F50-X Series is UV curable which makes it suitable for film touch panel and OLED bonding applications.

Key Features

- High peel adhesion to glass
- Outstanding optical performance
- Outstanding drop performance
- Moderate liner release force for OLED lamination

Product Construction

Product	3M™ OCA 8F50-3 (3M film CEF5003)	3M™ OCA 8F50-4 (3M film CEF5004)	3M™ OCA 8F50-5 (3M film CEF5005)	3M™ OCA 8F50-6 (3M film CEF5006)
Adhesive Type:	Acrylic	Acrylic	Acrylic	Acrylic
Adhesive Carrier:	None	None	None	None
Approximate Thickness:				
Release Liner:	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
Adhesive:	75 µm (3.0 mils)	100 µm (4.0 mils)	125 µm (5.0 mils)	150 µm (6.0 mils)
Release Liner:	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

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.

Performance to Environmental Conditions:

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 cover glass/3M OCA 8F50-X/hard-coated polarizer.

	Condition	Duration
High Temperature	+70°C	1000 hours
Low Temperature	-40°C	1000 hours
High Temp/Humidity-2	+85°C/85%RH	1000 hours
Thermal Shock	-40°C and +85°C (1 hour dwell, <1 min ramp time)	500 cycles
QUV	.78 W/m ² at 340nm	500 hours

Peel Adhesion:

ASTM D3330 modified, 180 degree peel from glass, 1 in wide peel strips, 12 in/min (305 mm/min), 2.0 mil polyester backing, 3M OCA 8F50-X Series

Peel Adhesion to Glass				
Dwell Time	20 min dwell at 25°C/50%RH		12 hr dwell at 25°C/50%RH	
Cure Condition	Uncured	UV (3J @365nm LED)	Uncured	UV (3J @365nm LED)
Units	kgf/in	kgf/in	kgf/in	kgf/in
3M OCA 8F50-4 (3M film CEF5004)	2.86	2.28	3.45	2.92
3M OCA 8F50-5 (3M film CEF5005)	3.49	2.98	4.11	3.47

Color:

Ultra Scan Pro (Hunter Lab), ASTM E308, D65/10° 3M OCA 8F50-X Series on LCD glass, cured 3J @365 nm LED

3M™ OCA 8F50-4
L* = 96.5
a* = 0.39
b* = 0.36

Haze:

Haze is measured according to ASTM D1003-92, 3M OCA 8F50-X Series on LCD glass, cured 3J @ 365nm LED

3M™ OCA 8F50-4
0.06%

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Refractive Index:

(+ 0.0005 Metricon measurements)

3M™ OCA 8F50-X	
	589 nm
Uncured	1.4850
Cured	1.4852

Typical Electrical Properties at Room Temperature:

ASTM-D150-92. 3M 8F50-X cured 3J/cm²

Dielectric Constant:

3M™ OCA 8F50-X		
Frequency (kHz)	Uncured	Cured
1	5.14	5.13
10	4.49	4.48
100	3.93	3.93
1000	3.52	3.53

Suggested Lamination Process

Step 1: Remove secondary liner, and then laminate 3M OCA 8F50-X to first adherent substrate by roller at room temperature

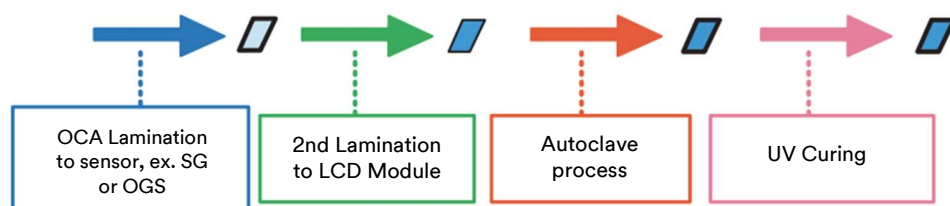
Recommendation: roller pressure 0.1 – 0.2 MPa, roller speed 0.5 – 1 m/min

Step 2: Remove primary liner, and then laminate 3M OCA 8F50-X/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/cm²/20-30min

Step 4: UV curing with minimum 3J/cm² dosage



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.
- Product must be protected from light exposure.
- Store in sealed, foil bag under -20°C to 30°C and less than 70% relative humidity. If removed from cold storage, ensure no condensation on packaging.

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UV Cure Guidance

- UV range: 340-375nm (max absorption = 342nm)
- Minimum UV dosage and intensity: 3 J/cm², 10 mW/cm²
- Suggest using lower wavelengths of the UV-A spectra. Suitable UV sources would be Fusion D bulb and medium pressure Hg.
- LED sources, which output at longer UV-A wavelengths would be less ideal.

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