

3M™ Contrast Enhancement Film (CEF94XX/OCA 8F94-X Series)

- 3M film CEF9401/3M OCA 8F94-1
- 3M film CEF94014/3M OCA 8F94-1.4
- 3M film CEF9402
- 3M film CEF9403
- 3M film CEF9404



Product Description

3M™ Contrast Enhancement Film CEF94XX Series is a specialized optically clear adhesive offering clarity and adhesion to various transparent display substrates. 3M film CEF94XX Series is designed for applications of foldable devices that require durable dynamic folding and static folding performance. 3M film CEF94XX can be laminated via the conventional film Optically Clear Adhesive (OCA) lamination process and it contains no carrier film. No ultraviolet (UV) curing required.

Key Features

- Low modulus, especially at low temperatures
- Elasticity for quick recovery after folding
- Durability through repeated folding cycles

Product Construction

Product	3M™ film CEF9401 (OCA 8F94-1)	3M™ film CEF94014 (OCA 8F94-1.4)	3M™ film CEF9402	3M™ film CEF9403	3M™ film CEF9404
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	75 µm (3.0 mils) Clear Polyester
Adhesive:	25 µm (1.0 mils)	35 µm (1.4 mils)	50 µm (2.0 mils)	75 µm (3.0 mils)	100 µm (4.0 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	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 constructions is cover-glass/3M film CEF94XX/LCD glass.

	Condition	Duration
High Temperature	+85°C	>500 hours*
High Temp/Humidity	+65°C/90%RH	>500 hours*

* For specifics on duration and color, contact a 3M expert

Peel Adhesion:

ASTM D3330 modified, 180 degree peel from glass, 1 cm wide peel strips, 12 in/min (305 mm/min), 2.0 mil polyester backing, 3M film CEF94XX.

Float Glass		
Dwell Time	20 min dwell at 25°C/50%RH	2 day dwell at 25°C/50%RH
Units	N/cm	N/cm
3M film CEF94014	0.5	>2
3M film CEF9402	0.6	3

* For specifics on duration and color, contact a 3M expert

Color:

Ultra Scan Pro (Hunter Lab), ASTM E308, D65/10° 3M film CEF94XX on optical glass.

3M™ film CEF9401	3M™ film CEF94014	3M™ film CEF9402
L* > 95.9	L* > 95.9	L* > 95.9
-0.2 < a* < 0.1	-0.2 < a* < 0.1	-0.2 < a* < 0.1
b* < 0.6	b* < 0.6	b* < 0.6

Refractive Index:

(±0.0005 from standard deviation of ellipsometry)

3M™ film CEF94XX
633 nm
1.469

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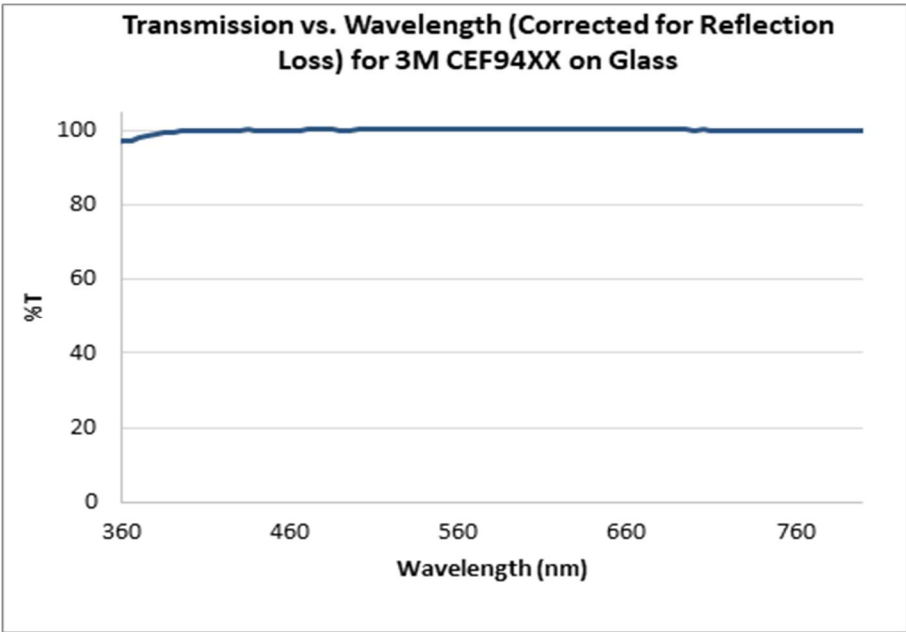
Haze:

Haze is measured according to ASTM D1003-92, 3M film CEF94XX on optical glass, uncured and cured.

3M™ film CEF94XX
< 0.5%

Transmission Curve:

3M film CEF94XX Series laminated to glass



Typical Electrical Properties at Room Temperature:

ASTM-D150-92. 3M film CEF94XX Series

Dielectric Constant:

3M™ film CEF94XX	
Frequency (kHz)	Dielectric Constant
100	4.3
300	4.2
500	4.1

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Suggested Lamination Process

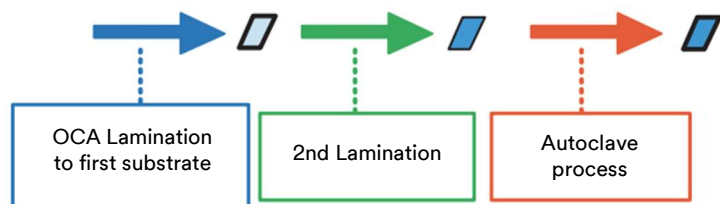
Step 1: Remove secondary liner, and then laminate 3M film CEF94XX to first adherent substrate by roller at room temperature

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 CEF94XX / 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



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.
- For additional storage conditions see products customer quality specifications (CQS) document.

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

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