

3M™ Contrast Enhancement Film

CEF61 Series High Dk Adhesive

Product Description

CEF61 Series adhesive is designed to improve touch sensitivity in devices with a high and constant Dk over a wide variety of process conditions. CEF61 offers excellent clarity and adhesion to various substrates including glass and polarizers.

- High and Stable Dk to improve touch sensor response
- Excellent ink-step coverage for ultra-slim designs
- UV Curable



Construction

Product	3M CEF6104	3M CEF6106	3M CEF6112
Caliper (um, mils)	100um 4.0 mils	150um 6.0 mils	300um 12.0 mils
Adhesive Type:	Acrylic	Acrylic	Acrylic

Please consult your 3M Representative for available liner options. 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.

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/CEF61/glass.

Condition		
High Temperature	+95°C	1000 hours
Low Temperature	-40°C	1000 hours
High Temp/Humidity-1	+65°C/90%RH	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)	300 cycles
UV	.55W/m ² at 340nm, Daylight filter	500 hours

Dielectric Constant (Dk)

Alpha A High Temperature broadband dielectric spectrometer modular measurement system (ASTM D150-92).

Dielectric Constant			
Frequency	100 kHz	300 kHz	1 MHz
CEF61 Series	9.0	8.1	7.5

Peel Adhesion:

ASTM D3330 modified, 180 degree peel from glass, 1 cm wide peel strips, 12in/min (305mm/min), 2.0 mil polyester backing, 3M CEF61 cured 3J/cm².

Condition		
Dwell Time	20 min dwell at 25°C/50%RH	3 days dwell at 25°C/50%RH
Units	N/cm	N/cm
CEF6104	5.1	6.8
CEF6106	5.7	7.6
CEF6112	6.9	9.8

Color:

Ultra Scan Pro (Hunter Lab), ASTM E308, D65/10° 3M CEF61 on LCD glass, uncured.

3M CEF61 Series			
CEF6104	L* = 96.4	a* = -0.29	b* = 0.15
CEF6106	L* = 96.4	a* = -0.30	b* = 0.17
CEF6112	L* = 96.4	a* = -0.32	b* = 0.19

Refractive Index:

(+0.0005 Meticon Measurements)

3M CEF61 Series			
Wavelength	405nm	532nm	633nm
Uncured	1.4972	1.4856	1.4829
Cured	1.4968	1.4848	1.4803

Haze:

Haze is measured according to ASTM D1003-92, 3M CEF61 on LCD glass, uncured.

3M CEF61 Series	
CEF6104	0.2%
CEF6106	
CEF6112	

Suggested Lamination Process

Step 1: Remove secondary liner, and then laminate 3M CEF61 to first adherent substrate by roller at room temperature

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

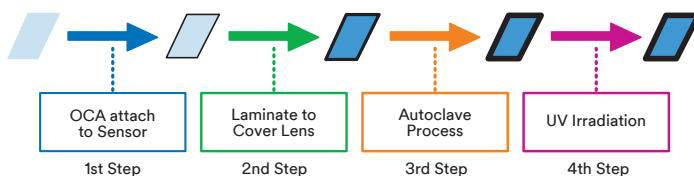
Step 2: Remove primary (tight) liner, and then laminate 3M CEF61/first adherent to second adherent by vacuum lamination (if rigid-to-rigid bonding)

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

Step 3: Autoclave process

(Recommendation: 30-60°C/3-5kgf/cm²/20-30min)

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

**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.

Storage

- 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.

Regulatory

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

Technical Information

The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes reliable, but the accuracy or completeness of such information is not guaranteed.

Product Use

Many factors beyond 3M's control and uniquely within the user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for determining if the product is fit for a particular purpose and suitable for user's method of application.

Warranty, Limited Remedy, and Disclaimer

Unless an additional warranty is specifically stated on the applicable 3M product packaging or product literature, 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OR CONDITION ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. If the 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

Limitation of Liability

Except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted.



3M Display Materials & Systems Division

3M Center, Building 235-1E-54
St. Paul, MN 55144-1000 U.S.A.

Phone 1-800-3M HELPS
Web 3M.com/OCA

3M is a trademark of 3M Company.
All other trademarks herein are the property of
their respective owners.

© 3M 2020. All rights reserved.

dZ 27001