3M Science. Applied to Life.™

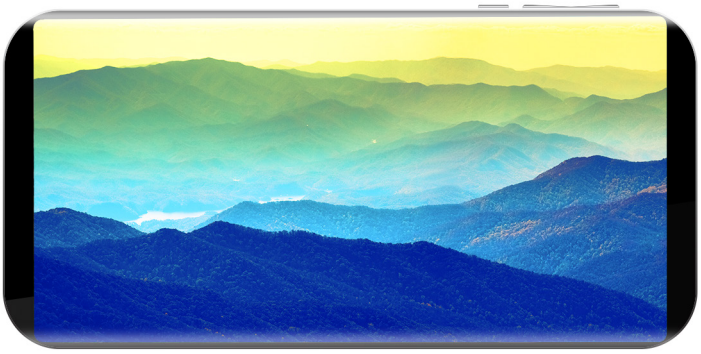
3M Display Materials & Systems Division

Technical Data 2018

3M™ Contrast Enhancement Film

CEF31XXAS Series

- High adhesion to curved applications
- Low initial tack for workability



Product Description

3M™ Contrast Enhancement Films (CEF) are specialized optically clear adhesives offering superior clarity and excellent adhesion to various transparent display substrates. 3M CEF31XXAS is suitable for bent display applications, and no UV curing is required.

Construction

Product	3M CEF3102AS	3M CEF3104AS	3M CEF3105AS	3M CEF3106AS
Adhesive Type:	Acrylic	Acrylic	Acrylic	Acrylic
Adhesive Carrier:	None	None	None	None
Approximate Thickness:				
Release Liner:	50 um (2.0 mils) Anti-Static Treated Clear Polyester	50 um (2.0 mils) Anti-Static Treated Clear Polyester	50 um (2.0 mils) Anti-Static Treated Clear Polyester	50 um (2.0 mils) Anti-Static Treated Clear Polyester
Adhesive:	50 um (2.0 mil)	100 um (4.0 mil)	125 um (5.0 mils)	150 um (6.0 mils)
Release Liner:	75 um (3.0 mils) Anti-Static Treated Clear Polyester	75 um (3.0 mils) Anti-Static Treated Clear Polyester	75 um (3.0 mils) Anti-Static Treated Clear Polyester	75 um (3.0 mils) Anti-Static Treated Clear Polyester

Note: 3M CEF31XX is also available without anti-static treated release liner.

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.

Environmental Performance 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 LCD glass/3M CEF31XXAS/LCD glass.

	Condition	Duration
High Temperature	+95°C	800 hours
High Temp/Humidity-1	+65°C/90%RH	800 hours
High Temp/Humidity-2	+85°C/85%RH	250 hours

Peel Adhesion:

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

Peel Adhesion to Glass		
Dwell Time	20 min dwell at 23°C/50%RH	3 days dwell at 23°C/50%RH
Units	N/cm	N/cm
3M CEF3102AS	6.4	8.5
3M CEF3104AS	11.0	14.1
3M CEF3105AS	11.6	14.6
3M CEF3106AS	12.0	15.2

Color:

Ultra Scan Pro (Hunter Lab), ASTM E308, D65/10°.
3M CEF31XXAS on LCD glass

3M CEF3102AS	3M CEF3104AS	3M CEF3105AS	3M CEF3106AS
L*=96.9	L* = 96.9	L* = 96.9	L* = 96.9
a*=0.00	a* = 0.00	a* = -0.02	a* = -0.03
b*=0.15	b* = 0.18	b* = 0.20	b* = 0.21

Refractive Index:

+ 0.0005 Metricon measurements

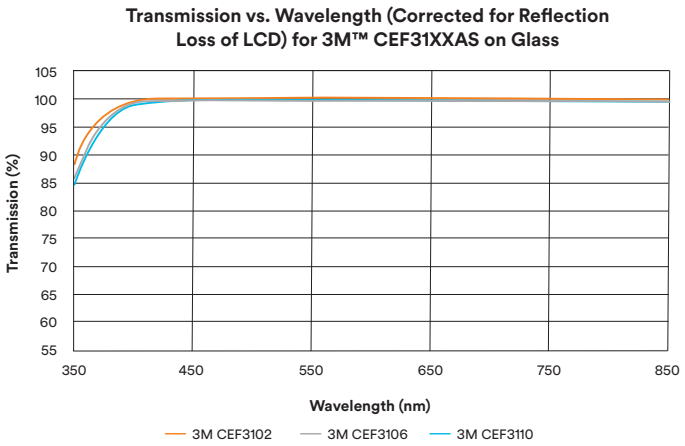
3M CEF31XXAS		
405nm	532nm	633nm
1.504	1.492	1.487

Haze:

Haze is measured according to ASTM D1003-92. 3M CEF31XXAS on LCD glass

3M CEF3102AS	3M CEF3104AS	3M CEF3105AS	3M CEF3106AS
0.2%	0.2%	0.2%	0.2%

Transmission Curve:



Typical Electrical Properties at Room Temperature:

ASTM-D150-92, 3M CEF31XXAS

Dielectric Constant:

3M CEF31XXAS	
Frequency (kHz)	Dielectric Constant
100	3.72
500	3.58

Suggested Lamination Process

Step 1: Remove secondary liner, then laminate 3M CEF31XXAS to first adherent substrate by roller at room temperature

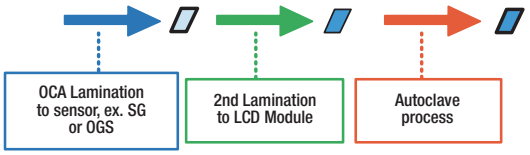
Recommendation: roller pressure 0.1 – 0.2 MPa, roller speed 0.5 – 1 m/min

Step 2: Remove primary liner, then laminate 3M CEF31XXAS/first adherent to second adherent by vacuum lamination

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

Step 3: Autoclave process

Recommendation: 30-60°C/3-5kgf/cm^2/ 20-30min



Storage

- Store in original packaging or plastic bag
- 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 should be unpacked and handled in a clean-room facility
- Store at room temperature conditions of 22 ± 2°C and 50 ± 20% relative humidity

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 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/displayfilms

 dz23681