

# 3M™ Optically Clear Adhesive 8146-x

## Product Description

3M™ Optically Clear Adhesive 8146-x is a new pressure sensitive adhesive technology that provides crystal clear, high reliability optical coupling and mechanical joining for various transparent materials.

3M Adhesive 8146-x is used for capacitive touch sensor film and lens bonding application. It is bare ITO compatible and outgassing resistant for PMMA substrates.

## Key Attributes

- High adhesion
- Easy to convert and cut
- ITO compatible
- Out-gassing resistant
- Whitening resistant
- Great option for bonding, PMMA, glass, PET, and other high surface energy & some lower surface energy substrates

## Product Construction

Product	3M™ Optically Clear Adhesive				
	8146-1	8146-2	8146-3	8146-4	8146-5
<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>	3.0 mil (75 micron) Polyester	3.0 mil (75 micron) Polyester	3.0 mil (75 micron) Polyester	3.0 mil (75 micron) Polyester	3.0 mil (75 micron) Polyester
<b>Adhesive</b>	1.0 mil (25 micron)	2.0 mil (50 micron)	3.0 mil (75 micron)	4.0 mil (100 micron)	5.0 mil (125 micron)
<b>Release Liner</b>	3.0 mil (75 micron) Polyester	3.0 mil (75 micron) Polyester	3.0 mil (75 micron) Polyester	3.0 mil (75 micron) Polyester	3.0 mil (75 micron) Polyester



**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.

**Refractive Index**

Abe Refractometer ( $\pm 0.0005$  measured for Sodium D line @ 25°C)

3M™ Optically Clear Adhesive 8146-x	
	1.474

**Haze**

Haze measured according to ASTM D1003-92.

3M™ Optically Clear Adhesive 8146-x	
	<1.0%

**Color**

ASTM-E1164-07 / CIELAB

(BYK Gardner TCS Plus spectrophotometer, model 8870)

3M™ Optically Clear Adhesive 8146-x	
	L* = 97.0
	a* = -0.07
	b* = 0.10

**Peel Adhesion:**

ASTM D3330 modified,

180 degree peel, 12 in./min. (305 mm/min.) To glass and lens bonding adhesives.

Condition	Unit	3M™ Optically Clear Adhesive									
		8146-1		8146-2		8146-3		8146-4		8146-5	
		oz/in	(N/100mm)	oz/in	(N/100mm)	oz/in	(N/100mm)	oz/in	(N/100mm)	oz/in	(N/100mm)
20 min dwell at RT	PMMA	30	33	40	43	44	48	50	54	51	55
20 min dwell at RT	PC	31	34	42	45	47	51	53	57	55	59
20 min dwell at RT	Glass	41	44	50	54	54	58	60	65	61	66

**Shear Adhesion**

ASTM D-3657

1/2" x 1" Overlap, minutes to failure.

3M™ Optically Clear Adhesive 8146-x	
Heat Aged 1000 gram, stainless steel	>10,000

## Shelf Life

A Product retains its performance and properties for two years from date of manufacture if properly stored at room temperature conditions of 72°F (22°C) and 50% relative humidity.

Storage in a plastic bag is recommended.

## Application Techniques

For maximum bond strength the surface should be thoroughly cleaned and dried. To obtain greatest benefit, laminations should be done in the cleanest environment possible with static charge elimination.

Bond strength can be improved with firm application pressure and moderate heat causing the adhesive to develop intimate contact with the bonding surface.

## General Information

- Light transmission >99% when corrected for reflection losses.
- Free of birefringence with no film carrier.
- High temperature, humidity, and UV resistance.
- Long term durability without yellowing, delaminating or degradation.
- High cohesive and peel strength for reliably bonding most transparent substrates.
- 3M™ Optically Clear Adhesive 8146-x is coated and converted in a clean room.
- 3M™ Optically Clear Adhesives are inspected to reduce the occurrence of bubbles, dirt, gels and other optical distortions.
- Wound on plastic cores and wrapped in plastic to eliminate paper fiber contamination.
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- Two film liners for optimum adhesive smoothness and differential release for ease of processing and protection from contamination.

## Application Ideas

- Touchscreens for bonding film and glass laminate.
- Transparent graphic overlays.
- Projection screens.
- Avionics/military displays.
- Optical management films for LCD.

## Processing

### Laminating

Recommended nip roll or roller platen press type laminator to maintain optical aesthetics when laminated.

Hand Lamination not advised. Use best process control standards Possible to control variables.

(See **3M Laminating Technical Bulletin** for additional information)

### Die Cutting

Use high precision, tight tolerance tooling designed to cleanly cut film and pressure-sensitive adhesive.

## Technical Information

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

## Product Use

Many factors beyond 3M's control and uniquely within 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 evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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