

# 3M™ Optically Clear Adhesives

## 8141 • 8142 • 8161 • 9483

### Product Description

**3M™ Optically Clear Adhesives:**

- 8141** 1.0 mil (25 microns) optically clear laminating adhesive for bonding smooth transparent substrates.
- 8142** 2.0 mils (50 microns) optically clear laminating adhesive for bonding smooth or textured transparent substrates.
- 8161** 1.0 mil (25 microns) optically clear laminating adhesive for bonding smooth transparent substrates. Easy to convert with improved bubble resistance in lamination exposed to high temperature and humidity.
- 9483** 5.0 mils (125 microns) optically clear laminating adhesive for bonding wide web (up to 48") applications and high stress laminates.

### Product Construction

Product Number	3M™ Optically Clear Adhesives			
	8141	8142	8161	9483
<b>Adhesive Type:</b>	Acrylic	Acrylic	Acrylic	Acrylic
<b>Adhesive Carrier</b>	None	None	None	None
<b>Approximate Thickness:</b>				
<b>Release Liner</b>	2.0 mils (50 microns) Polyester	2.0 mils (50 microns) Polyester	2.0 mils (50 microns) Polyester	3.0 mils (75 microns) Polypropylene
<b>Adhesive</b>	1.0 mil (25 microns)	2.0 mils (50 microns)	1.0 mil (25 microns)	5.0 mils (125 microns)
<b>Release Liner</b>	2.0 mils (50 microns) Polyester	2.0 mils (50 microns) Polyester	2.0 mils (50 microns) Polyester	3.0 mils (75 microns) Polyester

Products 8141, 8142, 8161 discontinued. Contact your local 3M representative for suggested replacement products.



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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.

### Refractive Index:

(± .0005 measured at 633 nm)

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1.4742	1.4749	1.4740	1.4740

### Haze:

Haze was measured according to ASTM D1003.

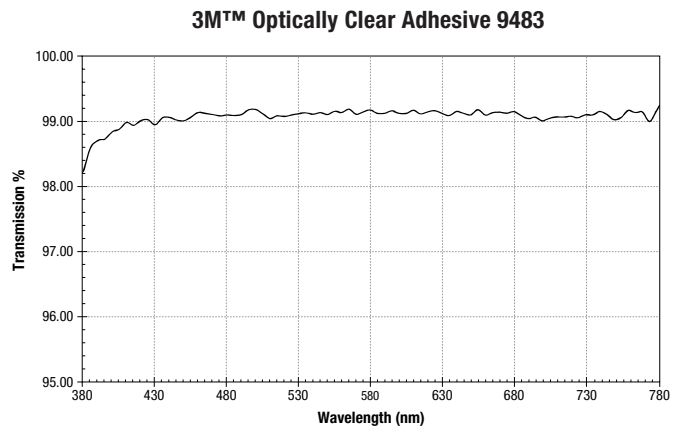
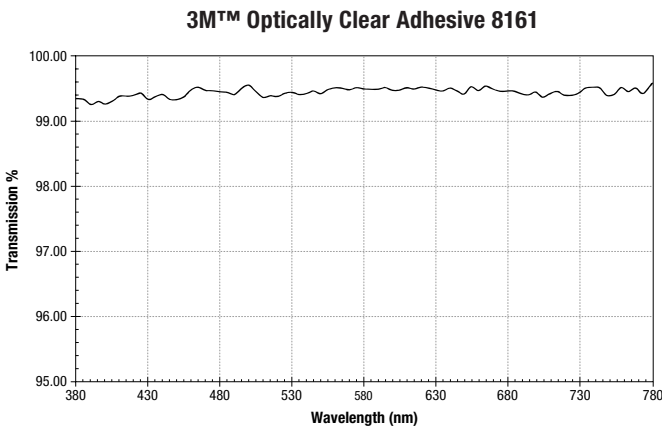
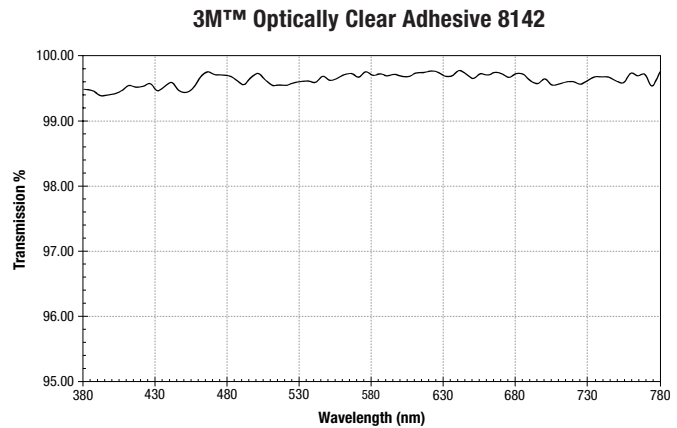
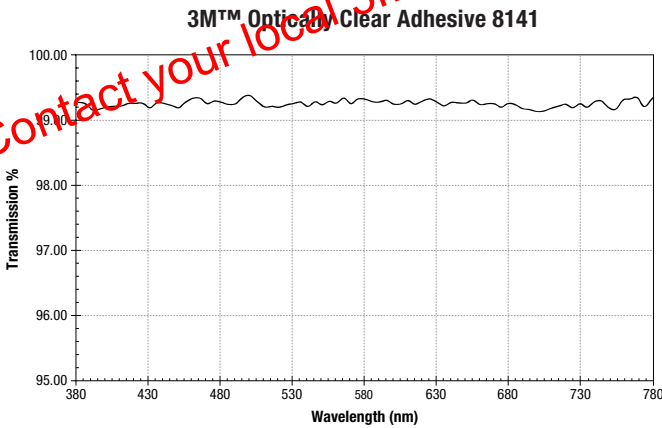
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0.1%	0.3%	0.8%	0.7%

### Transmission:

ASTM E903, D1003, and E284

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### Reflective Corrected Total Luminous Transmittance vs Wavelength



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## Typical Physical Properties and Performance Characteristics (continued)

**Note:** The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

### Optical Performance to Environmental Conditions:

3M™ Optically Clear Adhesives have withstood the following environmental tests conducted in the 3M laboratory under the conditions specified without any appreciable deterioration in visible appearance, physical integrity or optical performance. Over the entire test duration there was no significant change in transmission over the visible spectrum.

Substrate	Condition	Duration
High Temperature	+85°C	500 hours
Low Temperature	-40°C	500 hours
High Temp/Humidity	+70°C at 90% R.H.	500 hours
Thermal Shock	One hour at -40°C followed by one hour at +85°C	200 cycles
UV	ASTM G-26 Type B, BN	500 hours

### Peel Adhesion:

ASTM D3330 modified, 90° peel

Substrate	3M™ Optically Clear Adhesives			
	8141 <sup>1</sup>	8142 <sup>1</sup>	8161 <sup>2</sup>	9483 <sup>2</sup>
Initial (20 minute dwell)	Glass 22 oz/in (24 N/100 mm)	38 oz/in (42 N/100 mm)	61 oz/in (68 N/100 mm)	98 oz/in (107 N/100 mm)
	Acrylic 42 oz/in (46 N/100 mm)	56 oz/in (61 N/100 mm)	53 oz/in (58 N/100 mm)	62 oz/in (68 N/100 mm)
	Polycarbonate 38 oz/in (42 N/100 mm)	51 oz/in (56 N/100 mm)	40 oz/in (44 N/100 mm)	49 oz/in (54 N/100 mm)
72 Hour Room Temperature	Glass 26 oz/in (28 N/100 mm)	32 oz/in (35 N/100 mm)	61 oz/in (68 N/100 mm)	98 oz/in (107 N/100 mm)
	Acrylic 46 oz/in (50 N/100 mm)	63 oz/in (69 N/100 mm)	54 oz/in (59 N/100 mm)	62 oz/in (68 N/100 mm)
	Polycarbonate 42 oz/in (46 N/100 mm)	59 oz/in (65 N/100 mm)	60 oz/in (66 N/100 mm)	41 oz/in (45 N/100 mm)

<sup>1</sup>90 degree peel, 12 in./min. 305 mm/min. 2.0 mil polyester to various surfaces.

<sup>2</sup>90 degree peel, 12 in./min. 305 mm/min. 2.0 mil aluminum to various surfaces.

### Shear Adhesion:

ASTM D-3654 Procedure H

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

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Heat Aged (70°C) 500g, stainless steel	>10,000	>10,000	>10,000	>10,000

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## Typical Physical Properties and Performance Characteristics (continued)

**Note:** The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

### Chemical Resistance:

When properly applied, 3M™ Optically Clear Adhesives can withstand splashes of numerous chemicals including acetone, isopropyl alcohol, and cleaners.

### Water Resistance:

Immersion in water has no appreciable effect on the bond strength at room temperature.

### Relative Temperature Resistance:

Short Term High Temperature	350°F (177°C)
Long Term High Temperature	185°F (85°C)
Long Term Low Temperature	-40°F (-40°C)

### Shelf Life:

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 plastic bag is recommended.

## Available Sizes

Available Lengths (subject to minimum order requirements): Maximum length - 3M™ Optically Clear Adhesives 8141/8142/8161/9483	180 yards or 540 feet
Available Widths (subject to minimum order requirements): Maximum width - 3M™ Optically Clear Adhesives 8141/8142/8161 Maximum width - 3M™ Optically Clear Adhesive 9483	24 inches 48 inches
Normal Slitting Tolerance	± 1/32 in. (0.8 mm)
Core Size	3.0 in. (76.2 mm)

## 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.

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## General Information

- Light transmission >99% when corrected for reflection losses.
- Haze level < 1%.
- Free of birefringence with no film carrier.
- High temperature, humidity, and UV resistance.
- Long term durability without yellowing, delaminating, or degrading.
- High cohesive and peel strength for reliably bonding most transparent substrates.
- 3M™ Optically Clear Adhesives 8141, 8142 and 8161 are coated and converted in a clean room.  
3M™ Optically Clear Adhesive 9483 is coated using clean practices.
- 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.
- Two film liners for optimum adhesive smoothness and differential release for ease of processing and protection from contamination.
- 3M™ Optically Clear Adhesives are available in other thicknesses. Please contact 3M to discuss your application if you require a thickness that is not included in this data page.

## Application Ideas

- Touchscreens for bonding film and glass laminates.
- 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.

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## Certification/Recognition

**MSDS:** 3M has not prepared a MSDS for these products which are not subject to the MSDS requirements of the Occupational Safety and Health Administration's Hazard Communication Standard, 29 C.F.R. 1910.1200(b)(6)(v). When used under reasonable conditions or in accordance with the 3M directions for use, these products should not present a health and safety hazard. However, use or processing of the product in a manner not in accordance with the directions for use may affect their performance and present potential health and safety hazards.

**TSCA:** These products are defined as articles under the Toxic Substances Control Act and therefore, are exempt from inventory listing requirements.

**RoHS:** These products comply with the requirements of EU Directive 2002/95/EC and 2005/618/EC.

## For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-800-251-8634. Address correspondence to: 3M Electronics Markets Materials Division, Building 21-1W-10, 900 Bush Avenue, St. Paul, MN 55144-1000. Our fax number is 651-778-4244 or 1-877-369-2933. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-787-750-3000. In Mexico, phone: 52-70-04-0000.

## Important Notice

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