

3M™ Bonding Film 615R

Product Description

3M™ Bonding Film 615R is a flexible, light colored, thermoplastic adhesive bonding film which exhibits good adhesion to a variety of substrates. The bonding film is removable from the release coated paper carrier.

Key Features

- Suitable for kiss or through die cutting
- Consistent, uniform adhesive thickness
- Quick fixturing/holding strength
- Excellent adhesion to many substrates

Typical Physical Properties

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

Base Resin	Polyester Thermoplastic
Adhesive Thickness	6 mil (.006 in.)
Liner Thickness	3 mil (nominal)
Color	Translucent/Tan
Specific Gravity	1.00
Solids	100%
Ball and Ring Softening Range	240 to 250°F (116 to 123°C)
Tensile Strength @ Break	450 psi
Elongation @ Break	~300%
Two Lb. Dead Load Heat Resistance	215°F (102°C)

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Application Equipment Suggestions

Note: Appropriate application equipment can enhance bonding film performance. We suggest the following equipment for the user's evaluation in light of the user's particular purpose and method of application.

The type of application equipment used to bond 3M™ Bonding Film 615R will depend on the application involved and on the type of equipment available for the user. Thin films and flexible substrates can be bonded using a heated roll laminator where heat and pressure can be varied to suit the application. Larger, thicker substrates can be bonded using a heated static press or, in some cases, an autoclave. For applications where a shaped adhesive is to be transferred to a flat or three-dimensional part, a hot shoe or thermode method may be appropriate.

It is recommended that whatever method of bonding the user chooses, the user should determine the optimum bonding conditions using the specific substrates involved.

Directions For Use

To make a bond using 3M™ Bonding Film 615R, remove the liner and place the adhesive film between the two substrates. The bond is then made through heat and pressure using a heated press, a hot roll laminator, a hot shoe thermode method or similar equipment.

Alternatively, the adhesive can be first tacked (lightly bonded) to one of the substrates using low heat, then removing the liner and placing the second substrate to the exposed adhesive surface, making the bond using heat and pressure.

Suggested TACKING Conditions

100°F to 120°F (38°C to 49°C) bondline temperature

1-2 seconds dwell time

5-10 psi pressure

For optimum bonding, heat, pressure and dwell time will depend upon the type and thicknesses of the substrates being bonded together.

A suggested starting point is to use a method which will result in an adhesive bondline temperature of 275°F (135°C) for 2-5 seconds using 10-20 psi pressure.

Suggested BEGINNING Bonding Conditions

270°F to 280°F (132°C to 138°C) bondline temperature

2-5 seconds dwell time

10-20 psi pressure

One approach to establishing the correct/optimum bonding conditions for a user's application is to evaluate a series of bonding temperatures, for example 250, 275, 300, 325 and even 350°F (121, 135, 149, 163 and 177°C). Time and pressure will be dictated by the thickness of the substrate and the type of substrate being bonded. Thicker substrates and more difficult to bond surfaces will require longer times, higher pressures and higher temperatures.

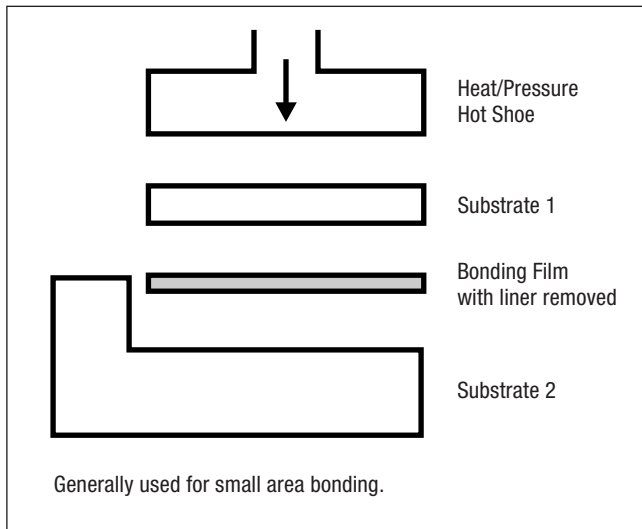
Once the bond is made, the bondline should be allowed to cool somewhat before stress is applied to the bond. Generally, cooling the bondline below 200°F (93°C) is adequate to allow the bonded parts to be unfixtured/ unclamped and handled.

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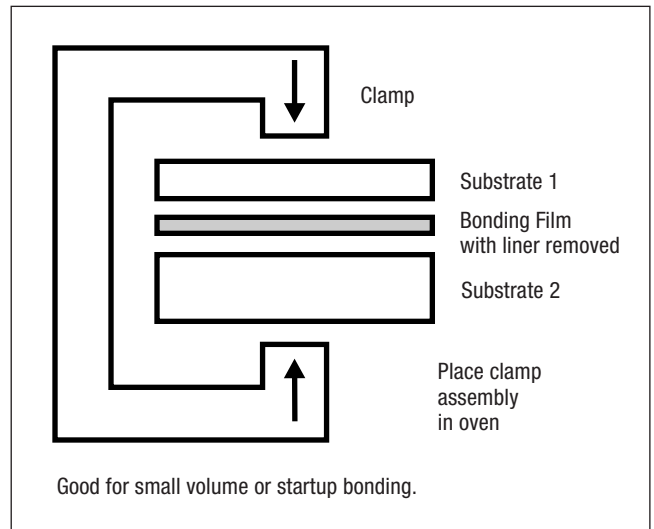
Typical Methods For Bonding 3M™ Bonding Film Adhesives

The following illustrations show several of the many methods that can be used to make bonds using 3M™ Bonding Film Adhesives. Equipment is generally available commercially or can be built or modified by the user to fit a particular application.

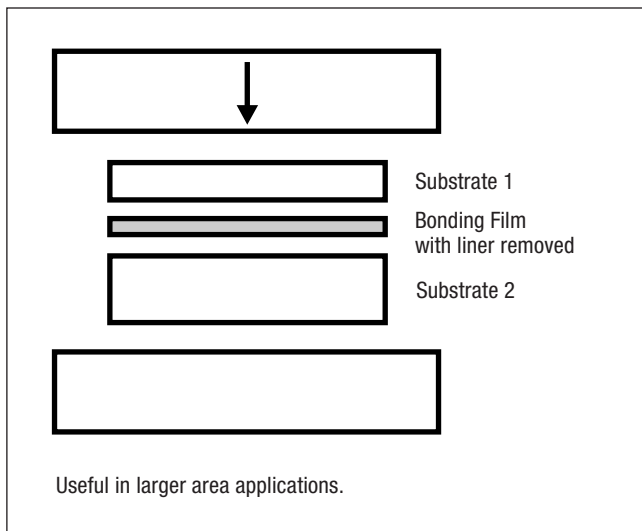
Hot Shoe or Thermode Bonding



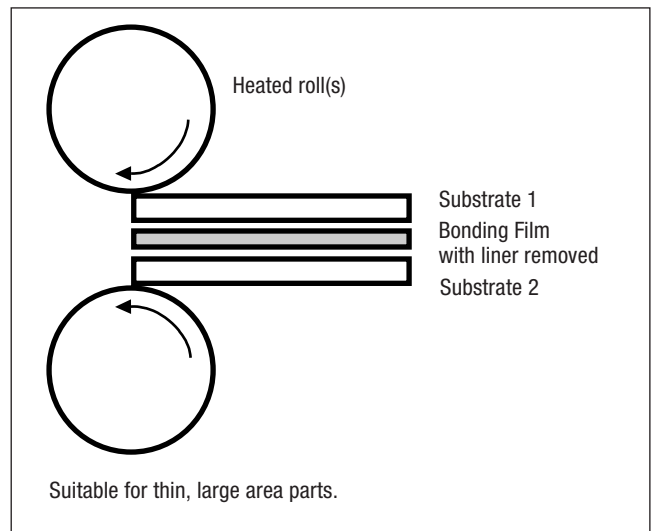
Oven (Static or ConveyORIZED) Bonding



Hydraulic or Mechanical Press Bonding



Lamination Bonding of Thin Substrates



Debonding – Since 3M™ Bonding Film 615R is a thermoplastic material, no curing during heating or aging occurs. To debond or open bonded parts, simply heat the bonded part to an adequate temperature (typically 275-300°F / 135-149°C) to soften the adhesive and then pry or peel the substrates apart.

Solvents, such as acetone, MEK, toluene and 3M™ Citrus Based Cleaner will soften this bonding film adhesive and can be used to remove excess adhesive in unwanted areas.* Soaking bonds in these solvents can also aid in debonding operations where appropriate.

***Note:** When using solvents, extinguish all ignition sources and follow the manufacturer's precautions and directions for use.

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Typical Performance Characteristics

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Adhesion to Various Substrates

Test Substrate	Overlap Shear 3M™ Bonding Film 615R (6.0 mil)	90° Peel 3M™ Bonding Film 615R (6.0 mil)
Stainless Steel	825 psi	16.0 piw
Aluminum	810 psi	15.5 piw
Polycarbonate	890 psi	11.5 piw
Acrylic	905 psi	13.0 piw
ABS	805 psi	10.0 piw

- Overlap shear made bonding 20 mil aluminum to test substrates using 280°F (138°C) bondline temperature, 5 seconds dwell, 5 lbs gauge pressure.
- Peel bonds made bonding 4.5 mil aluminum foil to test substrates using 280°F (138°C) bondline temperature, 5 seconds dwell, 5 lbs gauge pressure.
- Adhesion tests done using Intron @ 2 in/minute for peel, .2 in/minute for OLS.

Storage and Shelf Life

Storage: Store in a dry (preferably <50% RH) location at 35°F (2°C) to 80°F (27°C).

Shelf Life: Shelf life is 2 years from the date of shipment under storage conditions mentioned above.

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Certification/Recognition

MSDS: 3M has not prepared a MSDS for this product which is 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, the product 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 its performance and present potential health and safety hazards.

TSCA: This product is defined as an article under the Toxic Substances Control Act and therefore, it is exempt from inventory listing requirements.

RoHS: This product complies 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 1-877-369-2923. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-787-750-3000. In Mexico, phone: 52-70-04-00.

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