



# 3M™ Acrylic Foam and Acrylic *Plus* Tapes for Weatherstrip and Sealing Attachment

## Frequently Asked Questions

### General Product Information

- Q.** Why should I attach my seal with tape?
- A.** There are several reasons to use tape instead of mechanical methods of attachment. Weight and system cost savings can be realized over channel or pin systems. Additionally, tape allows for more than just attachment. It also seals the backside of the weatherstrip to help block out wind, noise, moisture and dust - when used as part of an overall vehicle noise reduction program.
- Q.** What is acrylic foam tape?
- A.** 3M™ Acrylic Foam Tape is a high performance attachment system for all types of body side moldings, stainless steel rocker panel trim, claddings, ground effects, wind and bug deflectors, interior dash trim kits, and most other automotive accessories and trim parts. This foam tape combines high performance acrylic adhesives with viscoelastic acrylic foam cores to create products with superior initial adhesion, adhesion build and the ability to dissipate the stresses associated with most automotive applications. 3M Acrylic Foam Tape is used globally for both OEM and aftermarket weatherstrip applications and conforms to all QS9000 requirements.
- Q.** Why do I need the thickness of foam tape?
- A.** 3M Acrylic Foam Tapes are designed with an acrylic foam core that has unique stress relaxation properties. The acrylic foam core also adds properties such as enhanced conformability along with its superior adhesion and stress relaxation. Seals with high application stress should use a thicker tape (e.g., 1.2mm caliper) as opposed to an application with little stress (for which a thinner tape, e.g., 0.2-0.8mm caliper, may be sufficient).
- Q.** Why doesn't the adhesive feel sticky?
- A.** 3M's high performance acrylic adhesives tend to be firm and dry to the touch. They are designed to bond materials other than skin. The adhesives used are designed to give optimum performance and adhesion to automotive substrates and components. The natural oils and moisture of skin can vary from person to person and affect the "thumb appeal" of the 3M Acrylic Foam Tape. To one person the tape can feel very sticky, but to another it can feel much less sticky to the touch. The difference in "thumb appeal" is in the variation of the two individuals' skin surfaces, not the adhesive. For this reason, "thumb appeal" should not be used to measure the tackiness of the tape.
- Q.** What is the difference between tapes used to attach body side moldings and weatherstrip?
- A.** The tapes used to attach body side moldings have a pressure-sensitive adhesive on both sides of the product. Because of the surface characteristics of the rubber weatherstrip, tapes used for weatherstrip attachment use a heat-activated adhesive to achieve the maximum bond strength to the rubber without using an adhesion promoter.
- Q.** Why should I use heat-bond tape?
- A.** There is an immediate, durable and consistent bond to the rubber when a heat-activated adhesive tape is used. With a PSA (pressure sensitive adhesive) tape, the rubber extrusion must be prepared with adhesive promoter and dried prior to laminating the PSA tape. Bond strength of tape to a rubber extrusion may not occur for several hours. Using heat-bond tapes is a one-step process (often done in-line with extrusion), does not involve the solvents found in adhesion promoters, and provides an immediate, durable, strong bond to the rubber.

**Q.** How do I know I have a good bond to my seal?

**A.** There is a simple procedure that will demonstrate the bond strength. Remove the liner from the taped part and laminate a strip of anodized aluminum. When peeling the aluminum off at a 90° angle, you should witness a cohesive failure of the tape, not failure of the heat-bond adhesive to the rubber.

**Q.** What is the difference between the N1 and E2 heat-activated adhesives?

**A.** N1 adhesive is designed to work with neoprene and PVC substrates, while E2 adhesive is designed to work with EPDM and TPEs.

### **Applying Taped Weatherstrip Seals to a Vehicle**

**Q.** Why do you use an adhesion promoter to attach the tape?

**A.** Adhesion promoters are most often used on low surface energy materials, such as TPO, polypropylene and many other plastics and plastic composites. Adhesion promoters or glass sealants are used to promote a durable bond between PSA tape and glass.

Adhesion promoters are generally not necessary for painted and clearcoated metal or plastic parts. Contact a 3M application engineer for more information on recommended adhesion promoters for specific substrates.

**Q.** How can I get the liner off the tape more easily?

**A.** The use of a tab is the most common method for easy liner removal. The options are:

1. Create a tab using the liner: The use of kiss cut die cutting or manual trimming of the tape to leave the liner extended past the taped area is the most effective way of providing a removal tab.
2. Add a heat bonded tab: Adding a secondary tape tab that is heat bonded to the liner in a secondary process using 3M™ Tapping Tape 5081 or 5400 is an option.
3. Add a pressure sensitive adhesive tab: Adding a tab using a pressure sensitive adhesive tape tab such as 3M™ Splicing Tape 5699 or 3M™ Tapping and Splicing Tape 5300 is also an alternative.
4. You should work with your designated 3M Technical Service person to determine the best solution for your application and process.

**Q.** How far in advance can I remove the liner?

**A.** It's recommended the liner only be removed immediately before use. Exposing the functional adhesive to the open air has little effect in itself. However, airborne contaminants may reduce the adhesive performance. Therefore, the exposure time should be minimized. As a rule, the less chance for contamination or the less time the adhesive is exposed, the better the bond will be.

**Q.** How much pressure is necessary for a tape-attached seal to ensure a good bond? How much pressure time is required?

**A.** The goal of pressurization is to achieve 100% wet-out of the adhesive, which can be affected by size, shape, rubber durometer and tape placement of the components to be bonded. As a rule, a minimum of 15 pounds pressure per ½" of tape width should be used. Pressure dwell time is not as important as application of firm, even pressure over the entire seal.

**Q.** What do you mean by "wet-out"?

**A.** Wet-out is simply the physical contact between the adhesive surface and the substrate. One hundred percent wet-out can only be achieved from a properly designed part that is properly pressurized to the substrate.

**Q.** The part is not adhering to the vehicle. What might be wrong?

**A.** There are a few things that could affect adhesion. Start by checking the following key areas that could affect adhesion or performance:

1. Check for surface contamination: The substrates must be clean and free of any contaminant. This is the most common cause of poor adhesion.
2. Check for surface match: Are the two surfaces to be bonded a good match resulting in full contact?
3. Check for proper application pressure and wet-out: Are the parts getting firm pressure along the entire bondline?
4. Check for excessive seal stretch: Has the seal been significantly stretched during the installation?

For further assistance with these matters, contact a 3M sales representative or application engineer.

**Q.** Can I reposition a tape-attached seal once it is applied?

**A.** If a part is positioned with slight spot pressure, it can usually be repositioned. If full pressurization takes place, it will be more difficult to remove, and may result in part damage or enough contamination of the adhesive to require part replacement. If the part has been applied and a good deal of time has elapsed, it will be very difficult to remove and will require part replacement.

**Q.** Is it better to pressurize or set-out the adhesive with rollers or with a platen?

**A.** Depending on the flexibility of the components, it is generally better to pressurize parts by rolling. A pressure fixture or roller with a diameter of at least 2 inches is optimal. To avoid air entrapment behind the adhesive, pressure application should simulate a rolling action. Firm, even pressure across the full tape area is necessary regardless of the application method.

**Q.** How can I get the part off after it has been applied?

**A.** In general, this is difficult to do unless it is removed immediately after application. The part can be gently heated to soften the adhesive and peeled, or the foam tape can be split at one end and the part carefully peeled off. Tape and adhesive residue can be removed with a 3M™ Stripe-Off Wheel (07499) without the use of solvents. 3M™ Prep Solvent 70 and 3M™ General Purpose Adhesive Cleaner\* can also be used to soften the adhesive residue, which can then be scraped off with a plastic squeegee.

\*Volatile Organic Compound (VOC) regulations in some states may restrict or prohibit use of certain solvent solutions. Please check with your state's environmental authorities to determine whether use of this solution is restricted or prohibited.

### Performance Questions

**Q.** What percent of the final bond strength can I expect immediately after application? After 24 hours? After 72 hours?

**A.** For information about the final bond strength performance, please contact your 3M technical service representative.

**Q.** How does the tape performance change at high temperature vs. low temperature?

**A.** For information about tape performance at high vs. low temperatures, please contact your 3M technical service representative.

**Q.** What is the highest temperature your tape can take and still perform?

**A.** Our 3M™ Acrylic Foam Tapes have had success in maintaining adhesion during short term paint repair bake conditions up to 250° for 30 minutes. Maximum long term temperature exposure should not exceed 200°F.

**Q.** Is the tape solvent resistant?

**A.** Yes, 3M Acrylic Foam Tapes are resistant to most common automotive solvents like gasoline, diesel fuel, washer solvent, etc. Solvent resistance is a function of type of solvent, time of exposure and temperature. For information about specific tape, please contact your 3M technical service representative.

**General Questions – 3M™ Acrylic *Plus* Weatherstrip tape**

- Q.** What is the difference between 3M™ Acrylic *Plus* Weatherstrip Attachment Tape and 3M™ Acrylic Foam Weatherstrip Tape?
- A.** The 3M Acrylic *Plus* Weatherstrip Tape product is an advancement in both the adhesive and core technology from conventional 3M AFT Weatherstrip Tape. The adhesive system of 3M Acrylic *Plus* Weatherstrip Tape provides better adhesion over a wide variety of conditions and substrates, while the core provides improved stress distribution properties. The stress distribution characteristic allows for a tighter bond line between the mating substrates (i.e., part and sheet metal) when mismatch exists, as well as improved wet-out and conformability for best sealing. Finally, the Acrylic *Plus* products are black, offering styling and cosmetic advantages for seal components.
- Q.** Why should I change if I do not have a problem?
- A.** 3M Acrylic *Plus* Weatherstrip Tapes offer a wide range of performance enhancements over conventional 3M AFT Weatherstrip Tapes for a variety of applications. The product is more robust, allowing for greater flexibility in design on future programs and improved reliability on existing programs. This benefit from a comparably priced product should allow for meaningful system cost reduction. 3M Acrylic *Plus* Weatherstrip Tape is the latest development in tape technology from the tape leader, 3M.
- Q.** What is the price of the tape?
- A.** 3M Acrylic *Plus* Weatherstrip Tapes are priced similarly to conventional 3M AFT Weatherstrip Tape products. The product was developed in this manner to maintain total system value while offering improved performance. This adds up to overall system cost reduction throughout the supply chain.
- Q.** What is the thickness of the tape?
- A.** 3M Acrylic *Plus* Weatherstrip Tape is currently offered in 1.2 mm thickness.
- Q.** Do you have weathering results?
- A.** Yes, we have two-year Florida/Arizona aging testing and vehicle probing ground testing on 3M Acrylic *Plus* Weatherstrip Tapes.
- Q.** What is the temperature range that 3M Acrylic *Plus* Weatherstrip Tape products can withstand?
- A.** The product is designed to sustain a temperature range of -40° F to 300° F over the life of the vehicle.
- Q.** Do you have to heat the body or the part during application?
- A.** No, as with conventional 3M AFT tapes, 3M does not recommend that the body or part be heated. Recommended application temperature range is between 60-100° F (16-38° C).
- Q.** Does the vehicle sheet Metal need to be cleaned?
- A.** Cleaning is recommended if contaminants are present that may impede tape adhesion, such as dirt, oils, or dust. It is a good safeguard in assembly plants and has been made much easier with the development of Scotch-Brite™ High Performance Wipes. An alcohol/water mixture is no longer needed for cleaning the body with the introduction of Scotch-Brite high performance wipes.
- Q.** How does the liner release of 3M Acrylic *Plus* Weatherstrip attachment tapes compare to conventional orange liners?
- A.** All 3M Acrylic *Plus* Weatherstrip Tapes utilize a uniquely designed liner to ensure smoother release and more consistent retention.
- Q.** How is this product tabbed?
- A.** Using an extended liner is generally considered the most reliable tabbing method. This liner can be heat-bond tabbed and pressure sensitive adhesive tabs are also available.
- Q.** Is this product recyclable?
- A.** It is similar to 3M AFT weatherstrip attachment tape and depends on specific recycling requirements.
- Q.** Where is the product made?
- A.** In a QS 9000-certified 3M production facility.

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- Q.** Is the new tape over-engineered? Can we reduce the usage and take out the cost?
- A.** No, the 3M Acrylic *Plus* Weatherstrip Tapes have been designed in response to an increase in demanding applications in automotive sealing systems. The tapes respond to the changing materials and paint systems, and also enable the use of tape-attached systems in previously risky areas such as underhood, primary sealing and seals to glass to help protect against water and noise intrusion.
- Q.** Does the tape have a stickier, higher-performing adhesive?
- A.** Yes, 3M Acrylic *Plus* Weatherstrip Tapes utilize a more aggressive adhesive system, translating into a higher initial tack and quicker adhesion-build.
- Q.** What adhesive is on 3M Acrylic *Plus* Weatherstrip Tapes?
- A.** 3M Acrylic *Plus* Weatherstrip Tapes utilize high-performance, acrylic-based adhesives on the vehicle or part side, and E2 adhesive, a heat-activated adhesive on the seal side. These vehicle side pressure-sensitive acrylic adhesives are designated as VR-2 (ST1200 tape) or JL-2 (WT4112 tape).
- Q.** Do VR-2 & JL2 adhesives perform like the AR-7 adhesive found on conventional 3M Acrylic Foam Weatherstrip Tapes?
- A.** Yes, these adhesives are similar to AR-7 adhesive (also an acrylic-based adhesive) but offer faster adhesion build to a wider variety of paint systems, and more stable adhesion levels over a broad range of environmental conditions.
- Q.** Will the foam split during application?
- A.** Foam split adhesion can be associated with many factors including removal speed and angle. Failure modes in destructive testing will be similar to those experienced with conventional 3M Acrylic Foam Tapes.
- Q.** Do I still need to use a promoter to bond to plastic substrates?
- A.** Yes, you still need to use a promoter to adhere to many plastic trim components. As with conventional 3M Acrylic Foam Tapes, no adhesion promoter is necessary for adhesion to paint.

#### **Wet-Out Questions – 3M™ Acrylic *Plus* Weatherstrip Tape**

- Q.** How can I get a better wet-out?
- A.** The 3M Acrylic *Plus* Weatherstrip Tapes offer a more conformable core than conventional 3M Acrylic Foam Tapes (AFT). The new technology allows you to achieve a unique balance of properties, including improved wet-out without sacrificing foam strength. This gives you a more conformable product than conventional 3M Acrylic Foam Tapes with better bond line integrity.
- Q.** Does it take the same amount of force or less force to wet-out?
- A.** Part wet-out has many variables. As with current systems, 3M provides technical support and recommendations for specific applications. Please check with your Technical Service person to determine the correct process for ensuring wet out for your application.
- Q.** Why don't I see a wet-out improvement on my application?
- A.** If your part is applied to a smooth surface and you achieve good wet-out with 3M AFT, you should expect to see similar results using 3M Acrylic *Plus* Tapes. The benefit of 3M Acrylic *Plus* Tapes is most apparent when applied to uneven surfaces (e.g., over weld dimples). Less than optimal wet-out conditions may still result from highly uneven surfaces or insufficient pressurization. Please contact your 3M sales and technical service personnel for assistance on these applications.

#### **3M™ Acrylic *Plus* Weatherstrip Tape WT4112**

- Q.** What is 3M™ Acrylic *Plus* Weatherstrip Tape WT4112?
- A.** 3M Acrylic *Plus* Weatherstrip Tape WT4112 complements 3M's already extensive line of weatherstrip attachment solutions. Utilizing proprietary technology, this weatherstrip attachment tape is designed to adhere to a wide variety of paints, including low surface energy and improved scratch- and mar-resistant paints. Automotive manufacturers can benefit from the high initial adhesion to many automotive clear coats, design flexibility, and ability to apply a continuous seal of the weatherstrip profile to the vehicle sheet-metal - all while lasting the life of the vehicle.

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**Q.** Why would I use 3M Acrylic *Plus* Weatherstrip Tape WT4112?

**A.** 3M Acrylic *Plus* Weatherstrip Tape WT4112 offers customers a more robust solution for weatherstrip applications, specifically tape attached primary door seals and seals found on recreational vehicles (RVs). This product offers customers the potential for:

- Inventory Simplification - customers can avoid stocking a myriad of tapes for application to multiple paint surfaces.
- Higher initial adhesion, especially on newer paint systems.
- A wider process window in robotic application.

**Q.** What sizes and thicknesses are available for 3M WT4112 tape?

**A.** 3M WT4112 tape is 1.2 mm thick and available in standard roll lengths and widths with a red polyester liner.

**Q.** Is there a difference in processing 3M WT4112 tape?

**A.** The processing of 3M WT4112 tape will be very similar to 3M ST1200 tape as the heat-activated adhesive is identical. Tabbing and splicing will be the same as the liner backing for both 3M tapes ST1200 and WT4112 are identical as well. The adhesive, the foam core and the liner have been improved.

**Q.** Are products samples available?

**A.** Yes, product samples are available and can be ordered by calling 3M customer service at 1-800-328-3081, or by contacting your 3M sales representative.

**Q.** How can I purchase 3M WT4112 tape?

**A.** It can be purchased by contacting your 3M sales representative or by calling 3M customer service at 1-800-328-3081.

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