Extreme Sealing Tape

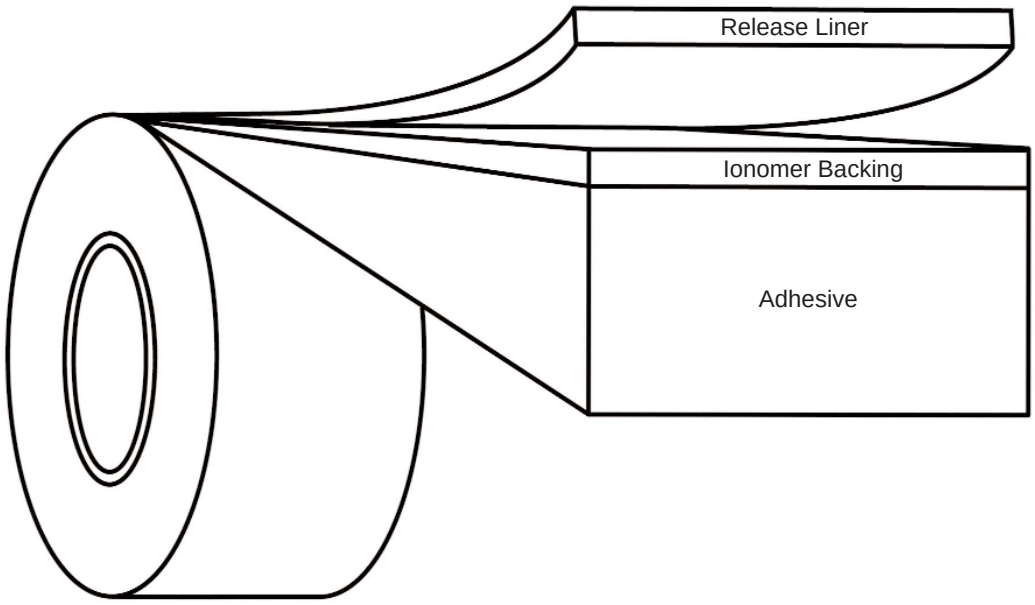
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Technical Data **September, 2014**

Product Description

3M™ Extreme Sealing Tape is a family of single coated, pressure sensitive adhesive tapes designed for difficult sealing applications. The backing on this tape is an ionomer film that is very tough yet flexible and abrasion resistant. The very soft and thick acrylic adhesive has excellent sealing properties and good outdoor durability. This single coated tape is designed to seal over an existing joint, seam, or penetration. The adhesive is designed to adhere well to the ionomer film so that overlapping tape joints can be made while maintaining a strong seal.

Construction



Construction	Thickness, mils (mm)					Description
	4411N	4411G	4411B	4412N	4412G	
Release Liner	2 (0.05)					matte, translucent polyester film
Ionomer Backing	4 (0.1)					acrylic and ethylene copolymer
Adhesive	36 (0.9)			76 (1.9)		very conformable multi-purpose acrylic
Total Tape Thickness	40 (1.0)			80 (2.0)		without disposable release liner

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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.

	3M™ Extreme Sealing Tape				
	4411N	**4411G**	**4411B**	**4412N**	**4412G**
Tape Color	Neutral/ Translucent	Gray	Black	Neutral/ Translucent	Gray
Thickness, mil (mm)	40 (1.0)			80 (2.0)	
Tape Density, lb/ft^3 (g/cm^3)	51 (0.82)				
Tape Tensile Strength, lb/in (N/cm) (ASTM D-3759 with D-412 dog bone die C)	13 (23)				
Tape Elongation to Break (ASTM D-3759 with D-412 dog bone die C)	400%				
90 Degree Peel Adhesion, lb/in (N/cm) Based on ASTM D-3330; stainless steel substrate, 72 hour room temp with 3M™ VHB™ Tape 5925 tape to attach aluminum peel strip backing; 3M™ Adhesion Promoter 111 used on substrates	15 (26)	16 (28)	17 (30)	18 (32)	18 (32)
Moisture Vapor Transmission Rate g/(m^2 day) (Tested for 4412N only) (ASTM E96, Procedure E)	Not Tested	Not Tested	Not Tested	10.6	Not Tested
Max Temperature Tolerance					
Short term (minutes, hours)	300°F (149°C)				
Long term (days, weeks)	200°F (93°C)				
High Pressure Water Resistance	Excellent				
Moisture Resistance	Excellent				
Thermal Shock Resistance	Excellent				
U.V. Resistance:	Samples passed adhesion tests after 2000 hours of accelerated aging. See “3M™ Extreme Sealing Tape - Exterior Durability Report”.				

Available Sizes

Standard Widths:	0.75", 1", 2", 2.5", 3", 4" (19mm 25mm, 50mm, 65mm, 75mm, 100mm)
Standard Lengths:	36 yards (32.9 meters) for 4411N, 4411G and 4411B 18 yards (16.5 meters) for all versions
Core Inside Diameter:	3" (76.2 mm)
Slitting Tolerance:	± 1/32" (0.8 mm)
Thickness Tolerance:	± 10%

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90 Degree Peel Adhesion Strength

(Based on ASTM D-3330; various substrates, 72 hour room temp with 3M™ VHB™ 5925 tape to attach aluminum peel strip backing; adhesion promoter or primer used on substrates)

			3M™ Extreme Sealing Tape									
			4411N		4411G		4411B		4412N		4412G	
		Surface Preparation	lb/in	N/cm	lb/in	N/cm	lb/in	N/cm	lb/in	N/cm	lb/in	N/cm
Substrate	Stainless	AP111	15	26	16	28	17	30	18	32	18	32
	Aluminum	AP111	15	26	15	26	19	33	18	32	18	32
	Truck Paint	AP111	14	25	15	26	17	30	19	33	17	30
	Glass	AP115	15	26	15	26	19	33	19	33	16	28
	PC	P94	16	28	15	26	18	32	18	32	18	32
	Acrylic	P94	15	26	15	26	16	28	19	33	17	30
	ABS	P94	16	28	16	28	18	32	19	33	18	32
	PVC	P94	16	28	15	26	19	33	19	33	18	32
	PP	P94	15	26	15	26	16	28	18	32	17	30

Notes:

1. For metals and paints, 3M™ Adhesion Promoter 111 was used to increase adhesion to maximum levels.
2. For glass, 3M™ Silane Glass Treatment AP115 was used to increase adhesion to maximum levels and to provide long term durability on glass.
3. For plastics, 3M™ Primer 94 was used to increase adhesion to maximum levels. Note that Primer 94 has high levels of VOC's and may not be available for purchase in all areas.

Preparing the Surfae

The first step in making a successful seal is to prepare the surface for bonding. At a minimum, this means making sure the bonding surface is clean of all contaminants. For most surfaces, cleaning with a 50:50 mixture of isopropyl alcohol***** (IPA) and water works well. If the substrate is contaminated with heavy oils or grease, a degreaser or strong solvent may be used to remove the oil, but a final wipe of IPA/water should be used.

For many substrates, a simple cleaning will allow 3M™ Extreme Sealing Tape to bond. However, adhesion promoters can be used to increase both initial and final bond strength. The following three primers are commonly used with 3M™ Extreme Sealing Tapes:

Metals and Paints
3M™ Adhesion Promoter 111 (AP111) increases adhesion on most metals and many hard coatings and paints.

Plastics and Rubbers
3M™ Primer 94 increases adhesion on many plastics and rubbers.

Glass
3M™ Adhesion Promoter 115 (AP115) increases adhesion on glass.

See technical data sheets for adhesion promoter and primer application instructions.

*****Consult manufacturer's directions for use and precautions when using cleaning solvents. This cleaning recommendation may not be compliant with the rules of certain Air Quality Management Districts in California; consult applicable rules before use.

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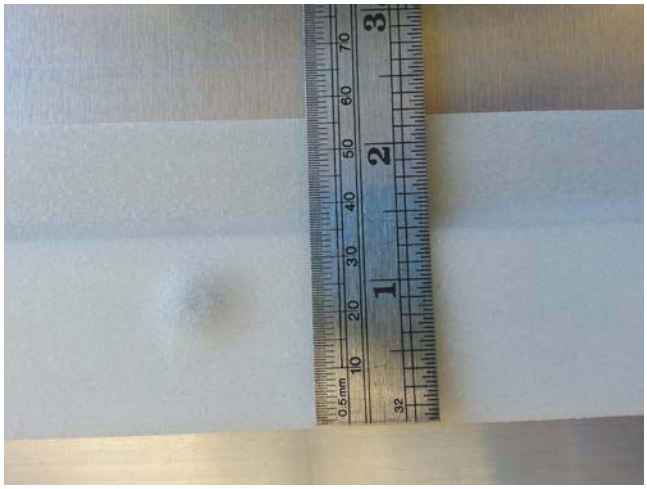
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Application Temperature

Ideal tape application is accomplished when temperature is between 70° and 100°F (21° and 38°C). The tape generally reaches full bond strength after 24 hours but provides a seal immediately. Tape application to surfaces at temperatures below 50°F (10°C) is generally not recommended. Once properly applied, low temperature holding is generally satisfactory.

Select the Proper Tape Width

In order to provide a seal, the tape must cover all points of water intrusion. To do this robustly, the tape should be wide enough to cover the intrusion points and provide for some variation in workmanship. Choosing a tape width that allows the tape to extend at least 2 cm (3/4 in) beyond the sealing points can help to accomplish this.



Applying 3M™ Extreme Sealing Tape

3M™ Extreme Sealing Tape has a release liner on the backing side of the tape. To avoid overstretching, this liner is usually left on while laying down the tape.

Application Steps



- Lay tape down so that it covers all areas meant to be sealed.
- Remove release liner (file cleaning brush can help)
- Roll down tape with a soft roller (such as a medium nap paint roller). If there is a step, roll down top and bottom separately.

Creating an Overlap Joint

It is often required to overlap 3M™ Extreme Sealing Tape onto itself. In this case, the ionomer backing of the first piece is one of the substrates to which the second piece of tape is bonding. The tapes should overlap at least 2 cm (3/4 in).

Surface Preparation

The ionomer does not need to be cleaned prior to bonding unless it has been contaminated with oil, dirt, grease, etc. If the bonding area of the ionomer has been contaminated, IPA/water can be used to clean the surface.

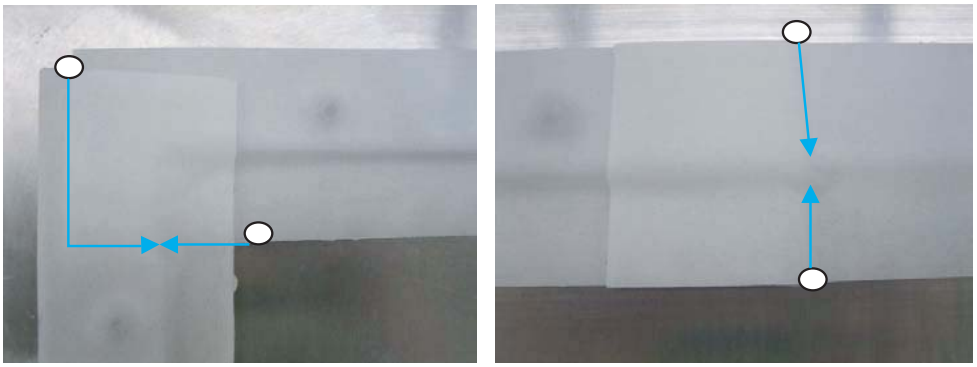
A quick wipe of AP111 on the ionomer is suggested for best performance of the overlapping tape. AP111 will approximately double Extreme Sealing Tape's adhesion to its own ionomer backing.

Pressure

Firm pressure should be applied to all points of overlap between the two tapes to join the adhesives and create a robust seal.

Additional Sealing

To increase sealing robustness, a small dab of liquid sealant 3M™ 4000UV is suggested at the points of overlapping tape. This step maximizes process robustness by decreasing the chance that an improperly pressurized overlap might leave a gap.



In the above images, the white circles indicate where 3M 4000UV should be applied in the corner and step situations. These two general categories can describe most common configurations. For configurations other than these, the general principle is to use 3M™ 4000UV in any place where water (shown as blue arrows) could seep past an improperly joined overlap.

Do not apply 3M™ Extreme Sealing Tape over the top of uncured liquid sealants. If using over a liquid sealant, check with sealant's manufacturer to determine when sealant is 100% cured. Certain chemicals produced by the curing process of some liquid sealants may cause detrimental effects to the long term stability of the bond.

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Storage

Store in original cartons at 40-100°F (4-38°C) and 0-95% relative humidity. Optimum storage conditions are 72°F (22°C) and 50% relative humidity.

Shelf Life

When stored under proper conditions, product retains its performance and properties for 24 months from date of shipment.

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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