PORON® Foam Tape (0.15, 0.20, and 0.25mm)

WINDOW ADHESIVE DATA SHEET

PORON® Foam Tape is more than the sum of its parts. The high performance microcellular urethane construction with a specially engineered adhesive combine to produce a versatile window adhesive with superior bond strength, impact protection and reliability.

WHY CHOOSE PORON® FOAM TAPE WINDOW ADHESIVE?

With superior bonding, PORON Foam Tape prevents catastrophic window delamination and performs well in extreme environments. The foam core and specially formulated adhesive provide best-in-class impact protection and bonding. Additionally, an integrated supporting layer provides dimensional stability, allowing for easy processing, repositioning and reworkability.

1. BONDING

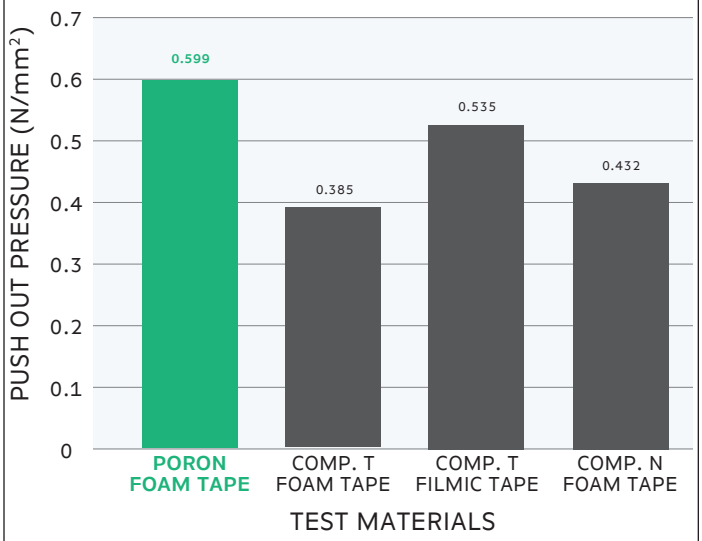
The most crucial function of a window adhesive is to create a strong, reliable bond between a device's cover window and frame. Rogers' bond strength test best simulates failure in this application. Catastrophic test conditions are replicated using an Instron® test machine, the results of which can be found in Graph 1.

As you can see, PORON Foam Tape outperforms competitive material by greater than 50%!

Visit the Assembly Force Tool for custom calculations.

rogerscorp.com/foamtape

GRAPH 1:
BOND STRENGTH COMPARISON*



*Data based on the averaged performance of thicknesses ranging from 0.15 to 0.25mm. For test specifics, see "Bond Strength" on page 5.

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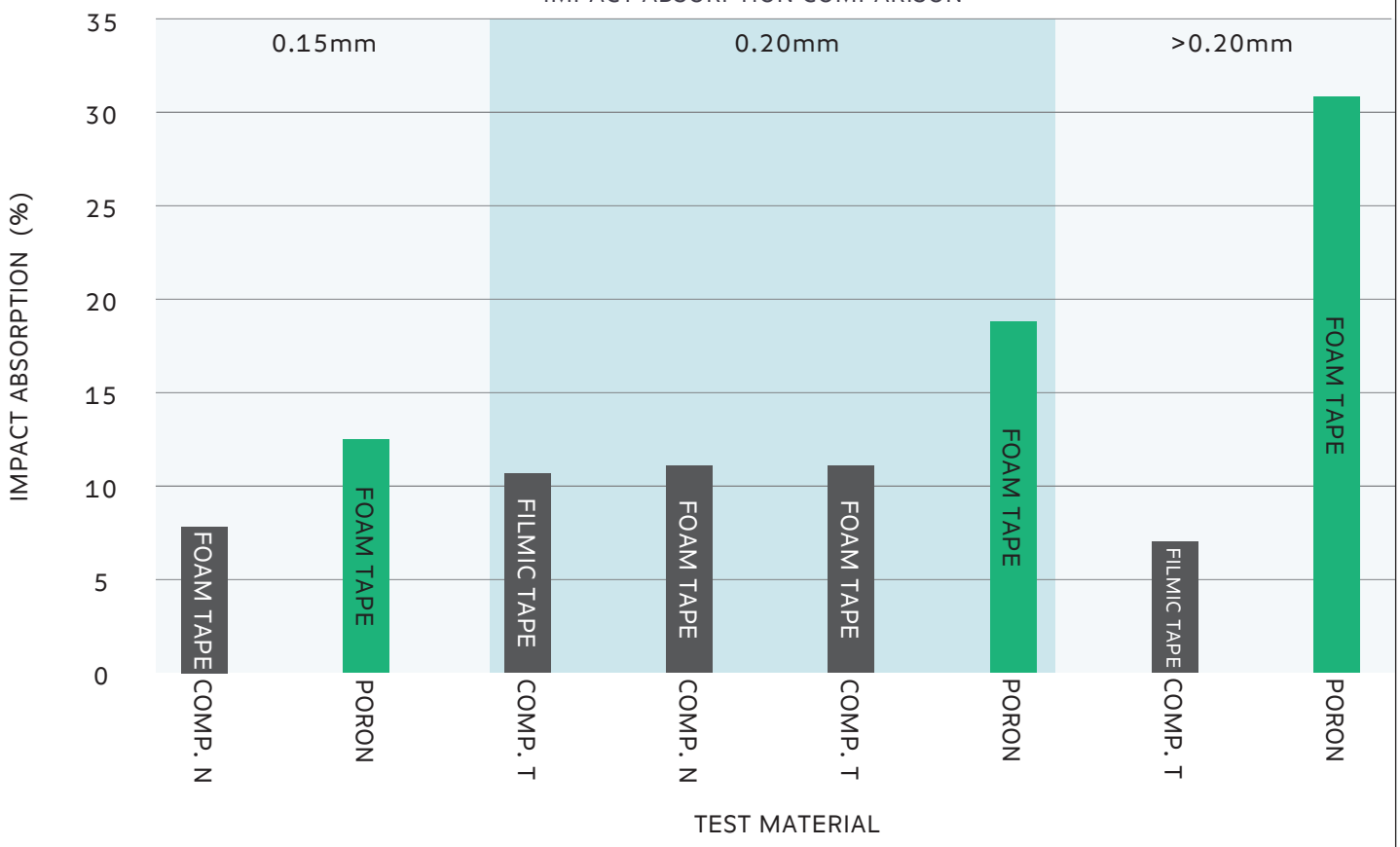
GRAPH 2:
IMPACT ABSORPTION COMPARISON*



*For test specifics, see "Impact Absorption" on page 5.

2. IMPACT PROTECTION

Protecting window glass from drops is vital in minimizing warranty claims and rework costs.

Impact tests illustrate how PORON Foam Tape can protect window glass from accidental falls and everyday hazards. The comparisons in Graph 2 (above) clearly show the value of using the right tape for the job.

3. RELIABILITY

PORON Foam Tape blocks out dust and water, passing a simulated IP67 test, while also performing very well in environmental exposure testing.

As with all PORON foams, Foam Tape does exceedingly well in maintaining its original thickness when under compression, ensuring integrity of design.

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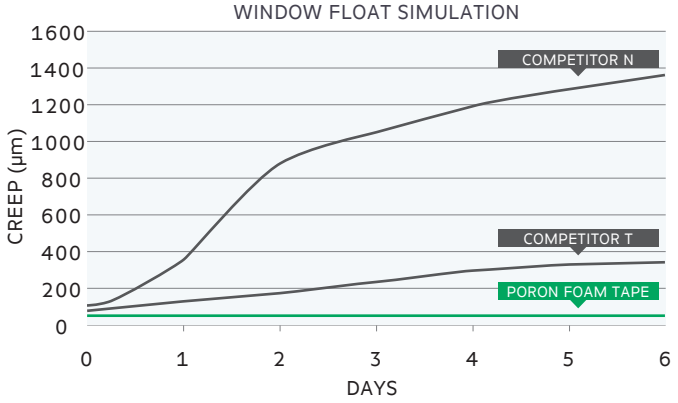
A common failure known as Window Float occurs when a window adhesive stretches. This type of failure, also known as creep, can lead to costly warranty claims.

In Rogers' Window Float Simulation test, or creep test, competitive materials exhibited high failure rates, stretching to many times the size of their original thickness (see Graph 3 at right). PORON Foam Tape proved superior, showing nearly zero creep.

GRAPH 3:
WINDOW FLOAT SIMULATION

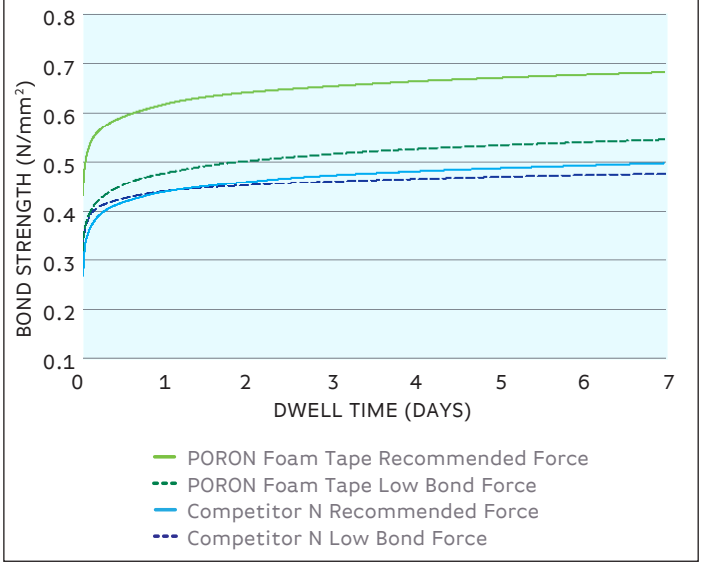


4. PROCESSABILITY

PORON Foam Tape is dimensionally stable, allowing for easy handling during device rework. Additionally, the adhesive cleanly separates from the housing, saving time during both repositioning and rework.

PORON Foam Tape is formulated for easy repositionability. This can lead to potentially higher yields as mistakes in processing can be quickly corrected. This also means that PORON Foam Tape requires specific dwell times for best performance (see Graph 4 at right).

GRAPH 4:
APPROXIMATE BOND STRENGTH BASED ON DWELL TIME AND BOND FORCE



WATCH PORON FOAM TAPE IN ACTION!

Visit: rogerscorp.com/foamtape

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APPENDIX

Assembly Force

The initial force used to bond the cover lens to the device frame using Foam Tape.

Assembly Time

The length of time that the Assembly Force is applied.

Creep

The displacement of the display lens over time.

Dwell Time

The time after the initial assembly force is applied, during which the bond strength increases. There is no force applied to the device during this time, and the device can be safely transported.

Repositionability

The ability to remove and reapply a Foam Tape part before the Assembly Force is applied.

Reworkability

The ability to disassemble a device bonded with Foam Tape after the Assembly Force is applied.

PROPER USE

Assembly Force

An assembly force of **0.5 N/mm²** for a duration of **5 seconds** or more is recommended to fix material in place and achieve maximum bond strength.

A dwell time of 24 hours will yield 93% of maximum bond strength, and full strength is achieved after three days.

Repositionability

Prior to applying assembly force, PORON Foam Tape can be easily repositioned within a device. This allows for quick, timely corrections, ultimately improving efficiency and yields.

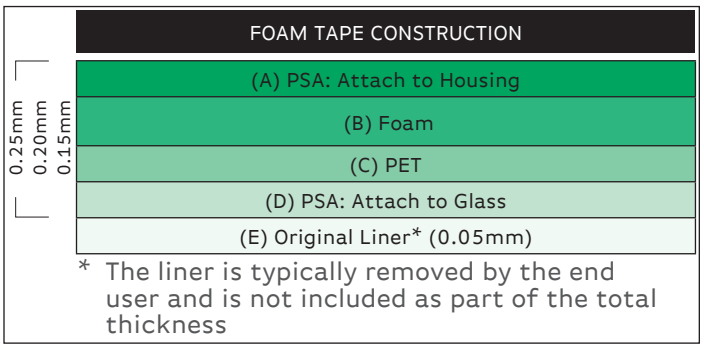
Reworkability

For detailed instructions on reworking devices after initial assembly force is applied, please refer to the PORON Foam Tape Rework & Repair guide available here:

www.rogerscorp.com/foamtape

Orientation

For optimal performance, orient the liner side (E) to the glass.



* The liner is typically removed by the end user and is not included as part of the total thickness

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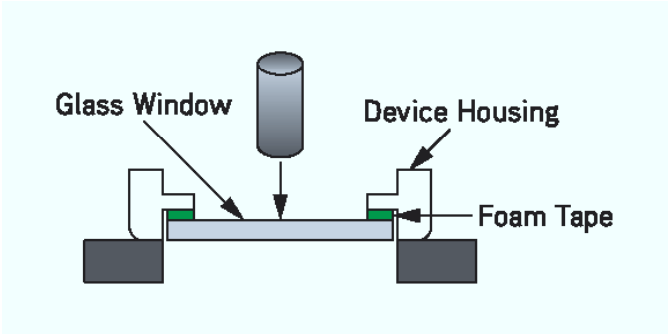
TEST METHODS

Bond Strength

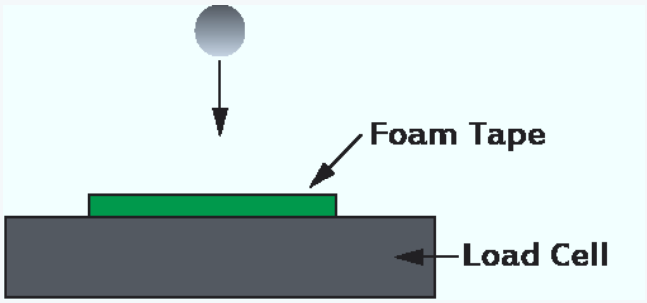
An Instron machine pushes from the inside of the glass window until the bond between the window and the housing made by the tape is broken. The force at bond breakage is recorded.



Impact Absorption

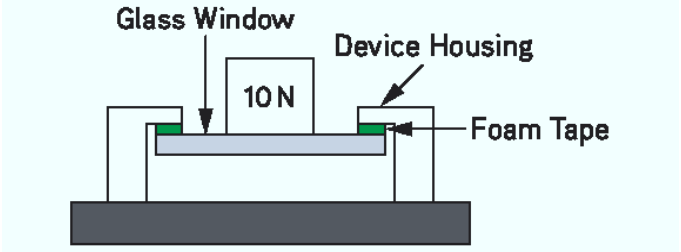
An acrylic ball is dropped onto a load cell from 30.5cm and the transmitted force is measured. Next, a sample of Foam Tape in placed on the load cell and the ball is dropped again and the transmitted force is measured. The impact absorption is calculated by:

$$100 \times \left(1 - \frac{\text{Force with Foam Tape sample}}{\text{Force with no sample}}\right)$$



Window Float Simulation

A 10N weight is placed on a glass window attached to the housing as shown in the picture at right. The creep is tracked. After 6 days of testing, the test is terminated and the total elongation of the tape is measured.



ASSEMBLY FORCE TOOL

Visit the Assembly Force Tool to determine proper force:
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Property				
Physical	**Method**	**Typical Properties**		
Total Thickness, mm (in)	PTP 0023	0.25(0.010)	0.20 (0.008)	0.15 (0.006)
Tolerance, %		±20	±20	±25
Tensile, N/mm^2		7.92		
Elongation, %		55		
Tear, N/cm		52.53		
Foam Density kg/m^3 ($lb./ft^3$)	ASTM D 3574-95 Test A	513 (32)	561 (35)	609 (38)
Compression Set*, % Typical	ASTM D 3574-95 Test D @ 70°C	2.7		
Standard Color (code)		Black (04)	Black (04)	Black (04)
Adhesion	**Method**	**Frame/lens**		**Typical Properties**
Bonding, N/mm^2	SSPO	metal/metal		1.517
Bonding, N/mm^2	SSPO	metal/asf glass		0.599
Bonding, N/mm^2	SSPO	PC 0.125"/Glass		0.676
Bonding, N/mm^2	SSPO	PC 0.250/Glass		0.545
Bonding, N/mm^2	SSPO	ABS/ABS		0.614
Bonding, N/mm^2	SSPO	ABS/Steel		0.807
Bonding, N/mm^2	SSPO	PMMA/PMMA		0.710
Bonding, N/mm^2	SSPO	PMMA/Steel		0.910
SAFT, °C	ASTM D4498-95	Stainless Steel		+200 C
		Substrate		
Peel, N/cm	ASTM D1000 00385 90° Adhesion Peel (20min dwell)	Stainless Steel (Foam Side)		3.831
		Polycarbonate (Foam Side)		3.831
		Polypropylene (FAL Side)		1.642
Release Liner, N/cm	ASTM D1000 02107			0.077

*Compression set is measured with Foam (B), PET (C), and one layer of PSA (D)

- All metric conversions are approximate.
- Typical values are a representation of an average value for the population of the property. For specification values contact Rogers Corporation.

Storage Information: PORON Foam Tape materials have a shelf life of 12 months from the date of manufacture when stored at room temperature. Storage in the original packaging located in a dry cool environment is recommended.