



Bumpon[™] Protective Products

Molded Shapes

SJ-5000 • SJ-5200 • SJ-5300 • SJ-5400
SJ-5500 • SJ-5700 • SJ-6100 Series

FOD# 1537

page 1 of 7

Technical Data

December 1, 1999

Supersedes December 1, 1998

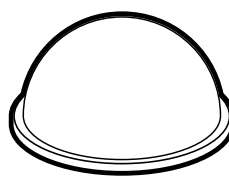
Product Description

3M Bumpon protective products are pressure sensitive adhesive-backed polyurethane products that can be used as feet, stops, spacers, and protectors in many applications.

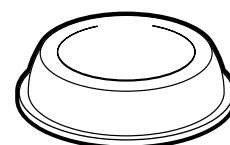
The urethane is a durable, resilient elastomer. The aggressive, high tack pressure sensitive adhesive is protected with a release liner making application fast and easy.



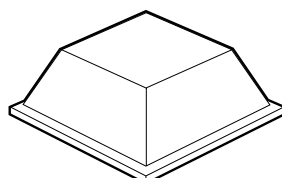
Top Hat



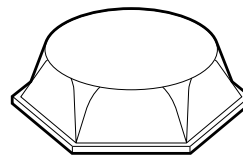
Hemisphere



Cylindrical



Tapered Square



Hexagon



Top Hat

Features

Bumpon protective products feature a plasticizer-free urethane composition which exhibits:

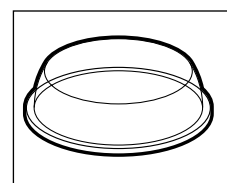
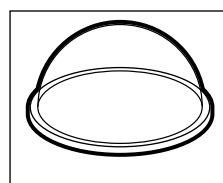
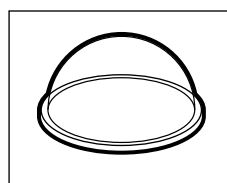
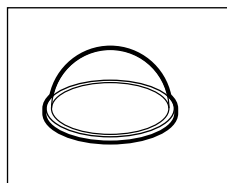
- Excellent skid resistance
- Long aging resiliency—will not crack or harden
- Abrasion resistance
- Resistance to marring and staining

Application Ideas

Use almost anywhere slamming, scratching, nicking, scuffing, marring, sliding, vibration, or noise could be a problem for your product.

- **Feet** on the bottom of blenders, desk top calculators, electronic cabinetry, telephones, keyboards, foot pedals, scales, clocks, speakers, dispensers, and computers.
- **Stops** for cabinet doors, lids, and drawers.
- **Spacers** for picture frames to provide alignment; for auto glass as an aid in assembly.
- **Protectors** for stacked glass and metal sheets.

Transparent and True White



Product Number

SJ-5302, SJ-5402*

SJ-5306, SJ-5406*

SJ-5303

SJ-5312, SJ-5412*

Colors

Transparent,
True White*

Transparent
True White*

Transparent,

Transparent,
True White*

Width inches (mm)

0.312 (7.9)

0.375 (9.5)

0.44 (11.1)

0.50 (12.7)

High inches (mm)

0.085 (2.2)

0.150 (3.8)

0.20 (5.0)

0.14 (3.5)

Form

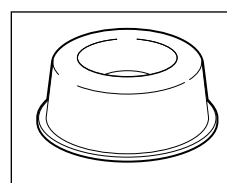
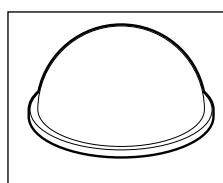
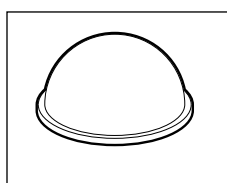
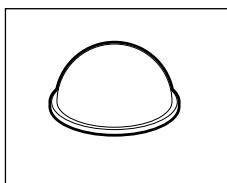
17x24 Matrix (SJ-5302)
8x18 Matrix (SJ-5402)

6x9 Matrix

8x7 Matrix

8x7 Matrix

Hemisphere



Product Number

SJ-5003

SJ-5027, SJ-5327**

SJ-5017, SJ-5317**

SJ-5009, SJ-5309**

Colors

White, Gray,
Brown, Black

White, Gray,
Brown, Black,
Transparent

White, Gray,
Brown, Black,
Transparent

White, Gray,
Brown, Black,
Transparent

Width inches (mm)

0.44 (11.1)

0.63 (16.0)

0.75 (19.0)

0.88 (22.3)

High inches (mm)

0.20 (5.0)

0.31 (7.9)

0.38 (9.6)

0.40 (10.1)

Form

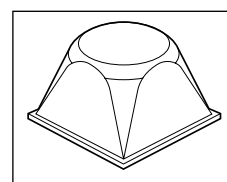
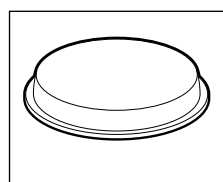
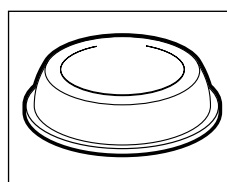
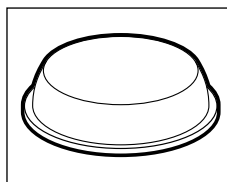
8x7 Matrix

5x8 Matrix

4x10 Matrix

3x8 Matrix

Cylindrical



Product Number

SJ-5012

SJ-5001, SJ-5301**

SJ-5744, SJ-5344**

SJ-5514

Colors

White, Gray,
Brown, Black

Black, Gray,
Transparent

Black,
Transparent

White, Gray,
Brown, Black

Width inches (mm)

0.50 (12.7)

0.50 (12.7)

0.75 (19)

0.81 (20.6)

High inches (mm)

0.14 (3.5)

0.14 (3.5)

0.16 (4.0)

0.52 (13.1)

Form

8x7 Matrix

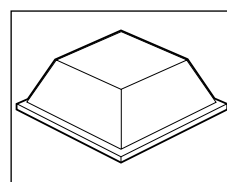
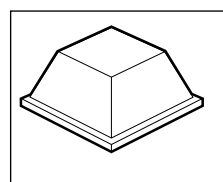
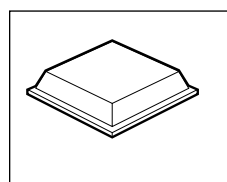
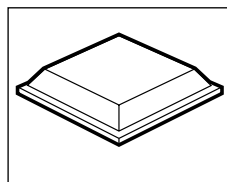
5x8 Matrix

4x10 Matrix

4x1 Matrix

Note: All dimensions ± 0.02 inches or ± 0.5 mm measured without the adhesive liner.

Tapered Square



Product Number

SJ-5007, SJ-5307**

SJ-5008, SJ-5308**

SJ-5018, SJ-5318**

SJ-5023, SJ-5323**

Colors

Black
Transparent

White, Gray
Brown, Black
Transparent

White, Gray
Brown, Black
Transparent

White, Gray,
Brown, Black
Transparent

Width inches (mm)

0.40 (10.2)

0.50 (12.7)

0.50 (12.7)

0.81 (20.5)

High inches (mm)

0.10 (2.5)

0.12 (3.1)

0.23 (5.8)

0.30 (7.6)

Form

6x9 Matrix

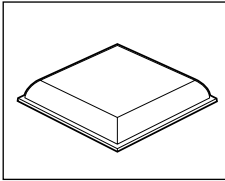
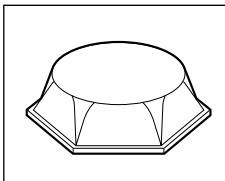
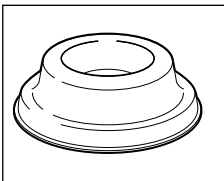
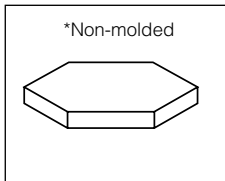
8x10 Matrix

8x10 Matrix

4x9 Matrix

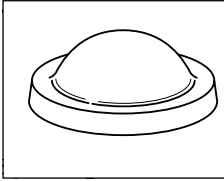
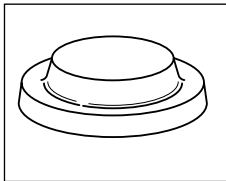
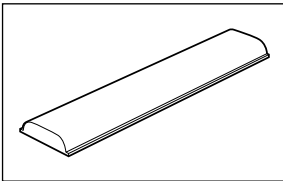
** Use 5300 Series to Identify Transparent Products.

Others

				
Product Number	SJ-5705	SJ-5077, SJ-5377	SJ-5532	SJ-5201, SJ-5202
Colors	Black	Black Transparent	White, Gray Brown, Black	Light Brown
Width inches (mm)	1.25 (31.75)	0.65 (16.5)	1.88 (47.7)	0.433 (11.0)
High inches (mm)	0.24 (6.1)	0.16 (4.0)	0.66 (16.7)	0.125 (3.2) (SJ-5201) 0.063 (1.6) (SJ-5202)
Form	Separate Parts	Pads of 39	Separate Parts	11x12 Matrix

* SJ-5201 and SJ-5202 are die cut parts from SJ-5200 series Rollstock.
Note: Above dimensions ± 0.02 inches or ± 0.5 mm measured without the adhesive liner.

Top Hat

			
Product Number	SJ-6115	SJ-6125	SJ-5510 Continuous Strip
Colors	Black	Black	Brown, White, Gray, Black
Diameter of Brim, inches (mm)	0.625 (15.9)	0.625 (15.9)	Width, inches (mm): 0.50 (12.7)
Height of Brim, inches (mm)	0.093 (2.36)	0.093 (2.36)	Height, inches (mm): 0.15 (3.88)
Total Height, inches (mm)	0.187 (4.75)	0.250 (6.35)	
Form	5x8 Matrix	5x8 Matrix	50' rolls, 5 rolls per case*

Note: Dimensions for SJ-6115 and SJ-6125 ± 0.005 inches (± 0.13 mm) for diameter ± 0.015 inches (± 0.38 mm) for height measured without adhesive liner.

* Continuous strip can be cut by the customer to a specific length. The surface has lines that appear every 9" on the strip.

Special Products

Custom Shape and Color

3M can match most colors and customize shapes to your specifications. Call your local 3M ITSD sales rep to discuss custom Bumpon products to meet your needs.

Adhesives for Special Applications

Foam tape and other special adhesives are available for many custom applications.

Special Easy Strip Packaging

Packaged into strips or die cut and perforated pads can help simplify some assembly operations.

Products currently available:

- SJ-5518 Die cut and perforated on pads of 64
- SJ-5508 Die cut and perforated on pads of 64
- SJ-5523 4x1 matrix separated by perforations
- SJ-5514 4x1 matrix separated by perforations

Note: Custom Bumpon products may require a qualifying minimum and/or a one time set-up charge.

Call your local 3M ITSD Sales Representative for more information.

Typical Physical Properties and Performance Characteristics

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

		Bumpon Product Series			
	Test Method	SJ-5000 SJ-5500 SJ-5700	SJ-5300 SJ-5400	SJ-5200	SJ-6100
Hardness, Shore A	ASTM-D2240	70	75	25	70
Resilience, %	ASTM-D2632, 0.125" sample	30	5	20	30
Kinetic Coefficient of Friction (M_k) (Dependent on Test Surface) ¹	ASTM-D1894				
	Stainless Steel	>1	>1	—	>1
	Glass	>1	>1	—	>1
	Formica® laminate	0.9-1.4	0.9-1.4	—	0.9-1.4
	Wood	0.9-1.4	0.9-1.4	—	0.9-1.4
Abrasion Resistance (Taber H18, 1kg) g/1000 cycles ²	ASTM-C501	1.7-1.9	0.13	—	0.13
Tensile, lbs/in ² (MPa) ²	ASTM-D412, Die A	600 (4.1)	740 (5.1)	120 (0.8)	600 (4.1)
Elongation, % ²	ASTM-D412, Die A	100	65	100	100
Dielectric Strength, volts/mil ²	ASTM-D1000	200	370	—	200
Stain Resistance	3M-24 hours @ 158° F against white paint 7 days exposed to UV.	No Staining	No Staining	No Staining	No Staining
Flammability Listing	UL-94HB	Pass; UL Recognized	Pass; Not UL Recognized ³	Not UL Recognized	Pass UL Recognized (color black only)

Notes:

¹ Two important laws of friction applicable to Bumpon products are: (1) Friction is independent of the area of contact between solids and (2) friction is proportional to the load between solid surfaces.

Thus, if the load (weight) is doubled the force required to cause sliding is also double. This is expressed mathematically as follows: Sliding Force = M_k x weight.

² These properties were run on sheet material from the same materials as the individual Bumpon products.

³ Testing performed by 3M; SJ-5300 series Bumpon products are not UL listed.

Solvent and Fuel Resistance

24 hour immersion

• 5% Detergent in water	No Apparent Effect
• 25% Ammonia in water	No Apparent Effect
• Bleach	No Apparent Effect
• Hydrochloric Acid (1 Normal Solution)	No Apparent Effect
• Diesel Fuel	No Apparent Effect
• Auto Oil	No Apparent Effect
• Isopropyl Alcohol	Slight Swelling
• Heptane	Slight Swelling
• Toluol	Considerable Swelling
• Lacquer Thinner	Considerable Swelling

Adhesive Description

Natural Rubber (R-30) - Used in the construction of SJ-5000, SJ-5500, and SJ-5700 series products. This high tack adhesive provides excellent initial adhesion and has the capability of providing excellent adhesion to a wide variety of surfaces, including many low surface energy surfaces such as polypropylene, polyethylene, and powder coated paints. This adhesive system shows reduced shear properties at elevated temperatures.

Acrylic (A-20) - Used in the construction of SJ-5200, SJ-5300, and SJ-5400 series products. This high strength adhesive system provides excellent shear strength properties. The adhesive has the capability of providing excellent adhesion to many high surface energy substrates such as metals, ABS, polycarbonate, and acrylic. When adhesion is required on low surface energy substrates (e.g., polypropylene, polyethylene, etc.), acrylic-based adhesives do not perform as well as rubber-based adhesives.

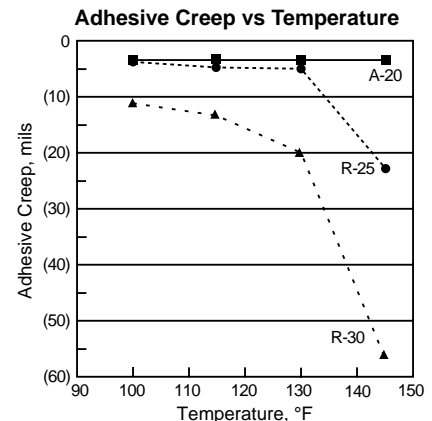
Synthetic Rubber (R-25) - Used in the construction of SJ-6100 series products. This very high tack adhesive system provides excellent initial adhesion and has the capability of providing excellent adhesion to a wide variety of surfaces, including many low surface energy surfaces such as polypropylene, polyethylene, and powder coated paints. This adhesive system shows reduced shear properties at elevated temperatures.

Adhesive Performance

Static Shear Strength

This figure on static shear illustrates typical performance characteristics of the adhesive systems used on molded Bumpon products.

3M Test Method-Inclined Plane Static Shear Test Method; 30° incline, tested on ABS using SJ-5312 (A-20), SJ-6112 (R-25) and SJ-5012 (R-30) products. 2 lb. load per Bumpon products. Measured time of creep: 15 minutes.



Relative Adhesive Performance Characteristics

Bumpon Protective Product Series	SJ-5000, SJ-5500 SJ-5700	SJ-5200, SJ-5300 SJ-5400	SJ-6100
Adhesive	Natural Rubber (R-30)	Acrylic (A-20)	Synthetic Rubber (R-25)
Initial Adhesion			
Low Surface Energy	Good	Poor	Excellent
High Surface Energy	Good	Fair	Excellent
Adhesion (Peel)			
Low Surface Energy	Good	Poor	Excellent
High Surface Energy	Good	Good	Excellent
Static Shear			
75°F (25°C)	Excellent	Excellent	Excellent
120°F (49°C)	Good	Excellent	Good
158°F (70°C)	Poor	Excellent	Fair
Impact Resistance			
Low Surface Energy	Excellent	Poor	Good
High Surface Energy	Excellent	Good	Good
Dynamic Shear	Good	Excellent	Good
Solvent Resistance	Good	Excellent	Good
Age Life	Good	Excellent	Good

*Some SJ-5700 series custom products may use other adhesives in their construction.

Application Information

Application Temperature: 40°F (5°C) to 125°F (52°C)

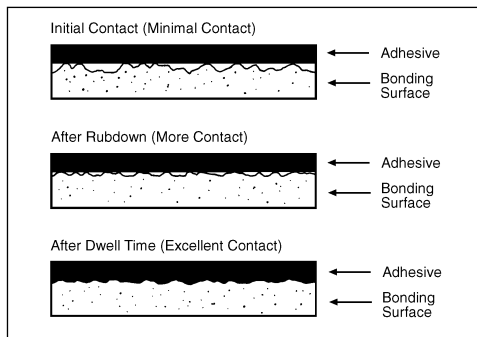
Service Temperature: Constant: -30°F (-34°C) to 150°F (66°C)
Intermittent: Up to 225°F (107°C)

To obtain maximum adhesion, surfaces must be unified, dry, and free of contaminants. Surface contact is essential to adhesive performance. To maximize contact on a substrate:

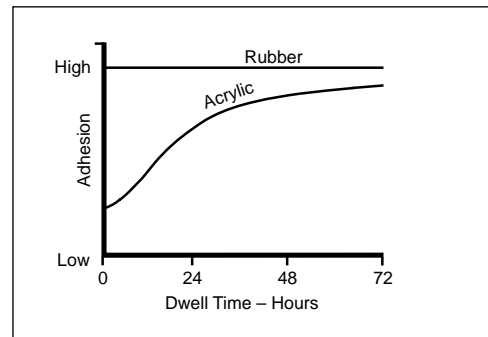
- Clean surfaces with low strength solvent such as isopropyl alcohol (rubbing alcohol) or heptane.*
- Apply firm pressure to help increase the cold flow and contact of the adhesive with the substrate.
- Allow time (dwell) to increase the surface contact and adhesion (see illustration below).

***Note:** Be sure to follow the manufacturer's precautions and directions for use when using solvents.

Adhesive Surface Contact



Rubber Adhesive (R-30) vs. Acrylic Adhesive (A-20) Bond Build Up



Environmental Exposure

Colored and transparent Bumpon™ products are intended for interior applications where resilience and other physical properties will remain unchanged. When exposed to UV light for extended periods some slight discoloration or yellowing may occur.

Bumpon products may be used outdoors in a protected area with some discoloration possible; colored Bumpon products may chalk.

Simultaneous exposure to high humidity and temperature may degrade (soften) the Bumpon product urethane.

Shelf Life

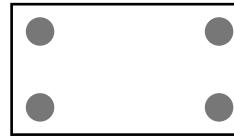
Shelf life is 18 months from date of manufacture when stored in original cartons at 60-80°F (15°-27°C) and 40-50% relative humidity.

Product Selections Considerations

Alignment

Alignment is more difficult with a rectangular shaped Bumpon product when no recess is provided.

Circular shaped product



(top view)

Rectangular shaped product



(top view)

Point of Contact

The point of contact provides either a large contact area or a very small (point) contact area depending on the shape of the Bumpon product.

Flat



(side view)

- Increased load capacity
- Better wear resistance

Hemisphere



(side view)

- Increased sound dampening
- Increased energy absorption

Profile

The profile is defined by the height and the diameter (or width) of the Bumpon product.

Low Profile



- Increased load capacity
- Less susceptible to being sheared off substrate

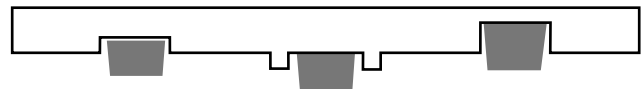
High Profile



- Better hear dissipation
- Not recommended if sideways shearing is possible

Recess

A recess is not necessary; however, there are several benefits to providing a recess.



- Provides target area for the Bumpon product during attachment process
- Improves adhesive performance: impact absorption and shear strength
- Provides neater appearance
- Provides uniform location

Technical Information and Data

The technical information and data, recommendations, and other statements provided are based on tests or experience which 3M believes to be reliable, but the accuracy or completeness of such information is not guaranteed.

Product Use

Please remember that many factors can affect the use and performance of a 3M product in a particular application. The materials to be bonded with the product, the surface preparation of those materials, the product selected for use, the conditions in which the product is used, and the time and environmental conditions in which the product is expected to perform are among the many factors that can affect the use and performance of a 3M product. Given the variety of factors that can affect the use and performance of a 3M product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application.

Warranty and Limited Remedy

The 3M product will be free from defects in material and manufacture for a period of one (1) year from the date of manufacture. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of application. If the 3M product is defective within the warranty period stated above, your exclusive remedy and 3M's sole obligation shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product.

Limitation of Remedies and Liability

Except where prohibited by law, 3M will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including contract, warranty, negligence, or strict liability.



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