



Bumpon™ Protective Products

Top Hat Design

SJ-6115 • SJ-6125

FOD #1542

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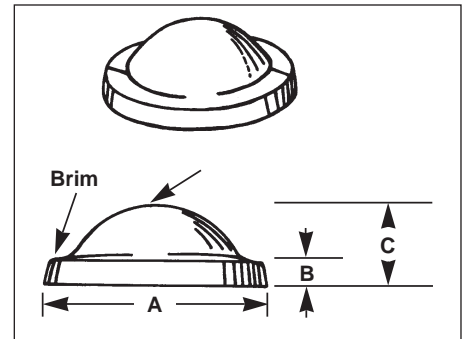
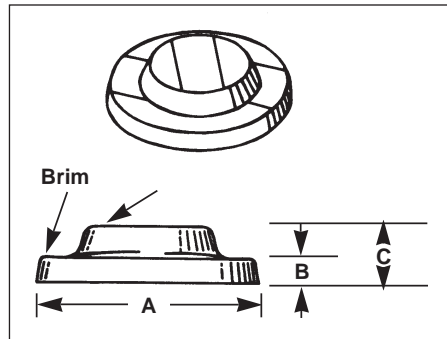
Technical Data

November 12, 1998

Supersedes October 1, 1998

Product Description

SJ-6115 and SJ-6125 Bumpon products are pressure-sensitive adhesive-backed polyurethane products that can be used as feet, stops, spacers, and protectors in many applications.



Product

SJ-6115

SJ-6125

Crown Shape

cylindrical

hemisphere

Color

black

black

Pad Form, matrix

5 x 8

5 x 8

Dimensions

A - Diameter of Brim, inches (mm)	0.625 (15.9)	0.625 (15.9)
B - Height of Brim, inches (mm)	0.093 (2.36)	0.093 (2.36)
C - Total Height, inches (mm)	0.187 (4.75)	0.250 (6.35)

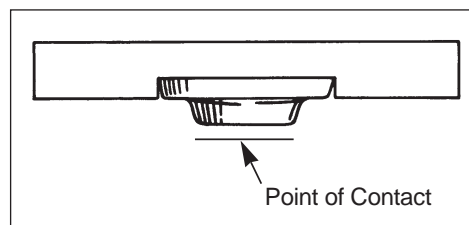
Dimension Tolerances - Diameter ± 0.005 inches (± 0.13 mm), Height ± 0.015 inches (± 0.38 mm) measured without the adhesive liner.

Advantages of Top Hat Design

- Ideal for many permanent applications
- Virtually impossible to remove when attached in recess cavity
- Extremely difficult to remove when not attached in recess cavity

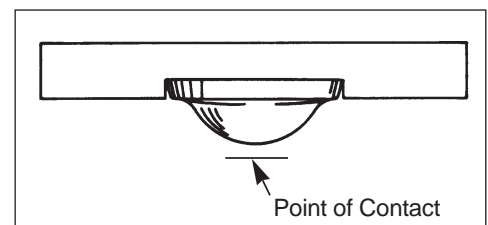
Top Hat Design Product Selection Considerations

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



Cylindrical Crown

- Increased load capacity.
- Better wear resistance.



Hemisphere Crown

- Increased sound dampening.
- Increased energy absorption.

Product Construction	Elastomer	polyurethane
	Adhesive*	synthetic rubber (R-25)

*Synthetic Rubber (R-25) – 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 and polyethylene.

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.

Property	Test Method	6100 Series Product
Hardness, Shore A	ASTM-D-2240	70
Approximate Density, lb./ft. ³ (gm/cm ³)		80 (1.3)
Resilience, %	ASTM-D-2632 (0.125 in. sample)	28-34
Kinetic Coefficient of Friction*	ASTM-D-1894	
	Stainless Steel	> 1
	Glass	> 1
	Formica® laminate	0.9 - 1.4
	Wood	0.9 - 1.4
*Two important laws of friction applicable to Bumpon rollstock 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 is to cause surface sliding is also doubled. This is expressed mathematically as follows:		
Sliding force = (kinetic coefficient of friction) x (weight)		
Abrasion Resistance Taber H 18, 1 kg, g/1000 cycles	ASTM-C-501	1.7 - 1.9
Tensile lb./in. ² (kPa)	ASTM-D-412, Die A	600 (4140)
Elongation, %	ASTM-D-412, Die A	100
Dielectric Strength, volts/mil	ASTM-D-1000	200
Stain Resistance	3M - 24 hrs. @ 158°F against white paint, 7 days exposed UV	no staining observed
Solvent and Fuel Resistance	3M - 24 hr. 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 effect (swelling)
	Heptane	slight effect (swelling)
	Toluol	considerable effect (swelling)
	Lacquer Thinner	considerable effect (swelling)
Flammability Listing	UL-94HB	Pass; UL recognized (color black only)

Relative Adhesive Performance Characteristics

The following table provides relative adhesive performance characteristics of the synthetic rubber (R-25) adhesive system used in the construction of SJ-6115 and SJ-6125 Bumpon products in comparison to the standard R-30 and A-20 Bumpon adhesive systems used in the construction of the 5000, 5500, 5300, and 5400 Series Bumpon

Bumpon product	5000 Series 5500 Series	5300 Series 5400 Series	SJ-6115 SJ-6125 6100 Series
Adhesive	Natural Rubber R-30	Acrylic A-20	Synthetic Rubber R-25
Adhesion (Peel)			
Low Surface Energy	Good	Poor	Excellent
High Surface Energy	Good	Good	Excellent
Static Shear			
75°F	Excellent	Excellent	Excellent
120°F	Fair	Excellent	Good
158°F	Poor	Excellent	Fair
Impact Resistance			
Low Surface Energy	Excellent	Poor	Good
High Surface Energy	Excellent	Good	Good
Dynamic Shear	Good	Excellent	Good
Initial Adhesion			
Low Surface Energy	Good	Poor	Excellent
High Surface Energy	Good	Fair	Excellent
Adhesion Buildup	Some	Gradual	Some
Solvent Resistance	Good	Excellent	Good
Age Life	Good	Excellent	Good

Application

To obtain maximum adhesion, surfaces must be unified, dry, and free of contaminants. Clean surfaces with low strength solvents such as isopropyl alcohol (rubbing alcohol) or heptane.* Apply firm pressure to help increase the contact of the adhesive with the substrate. Allow time (dwell) to increase adhesion. Application Temperature: +40°F (5°C) to 125°F (52°C).

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

Service Temperature

-30°F (-34°C) to 150°F (66°C); 225°F (107°C) intermittent exposure.

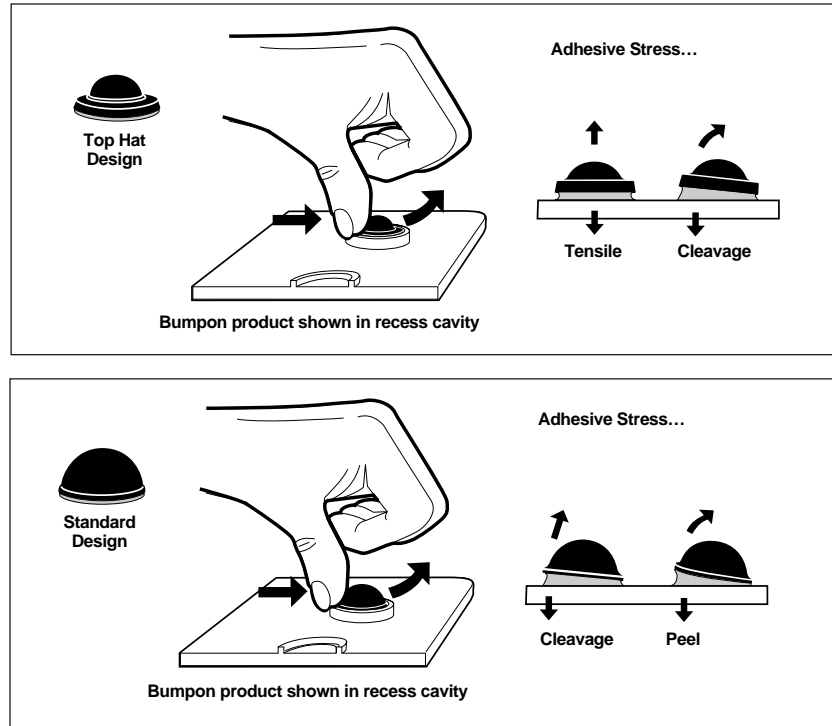
Environmental Performance

Bumpon products are intended for interior applications where resilience and other physical properties will remain unchanged. Exposure to UV light for extended periods may cause slight discoloration or yellowing. Bumpon products may be used outdoors in a protected area with possible discoloration and chalking. Simultaneous exposure to high humidity and temperature may degrade (soften) the product composition.

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.

**Adhesive Stress –
 Top Hat Design versus
 Standard Design**



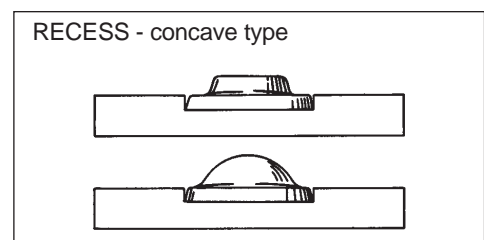
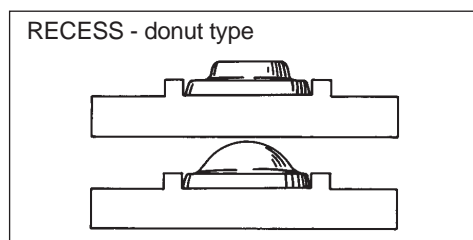
Top Hat Design versus Standard Design – Note from the diagram that the adhesive stress on the Top Hat design is a combination of tensile and cleavage versus the adhesive stress on the standard design which is a combination of cleavage and peel. As a result of the Top Hat design which decreases leverage, more of the adhesive is contributing to the overall strength at one time.

Adhesive Stress - Types and Definitions

- Tensile:** Forces are perpendicular to the bond plane. Stress is distributed over the entire bond area. All the adhesive contributes to the bond strength.
- Cleavage:** Forces are concentrated at the edge of the bond. Not all the bond area is contributing to the overall strength at one time.
- Peel:** Forces are confined to the edge of the bond. At least one surface is flexible. Even less adhesive contributes to the bond strength than in cleavage.
- Shear:** Forces are parallel to the bond plane. As with tensile, stress is distributed over the entire bond area. Shear is typically not a factor when Bumpon products are attached in a recess cavity.

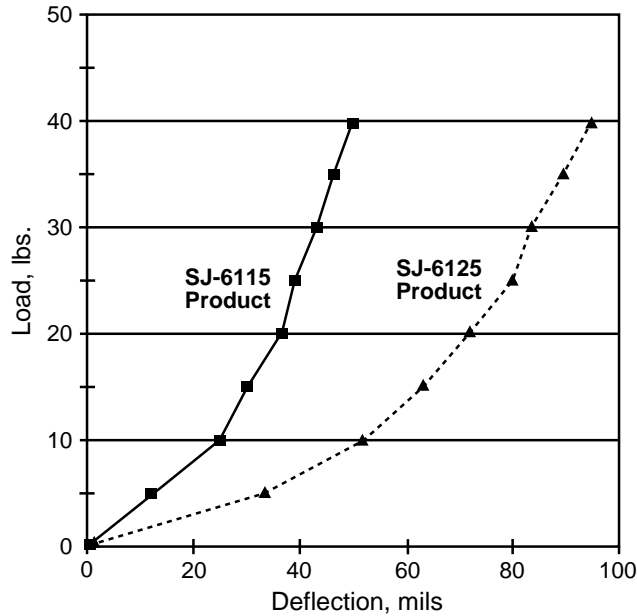
**Benefits of Providing
 Recess**

- Improves adhesive performance – shear strength and impact absorption.
- Provides neat appearance.
- Provides target area for Bumpon product during production.
- Provides uniform location.



To obtain best results with the Top Hat Design Products, the depth of the recess cavity should be equal to or slightly deeper than the height of the brim of the Bumpon product.

**Compression Force
 Deflection Curves**



Load Tolerance The recommended maximum loads which SJ-6115 and SJ-6125 Bumpon products will support under a continuous load are 15 lbs. and 10 lbs., respectively, per Bumpon product.

**Custom Top Hat
 Design Products
 through the
 Design-A-Bump
 Program**

Custom Shapes

3M can customize Top Hat Design Products for your specific requirements.

*Top Hat Design
 Custom Shape
 slightly Suggestions*

If the product is placed in a recessed cavity:

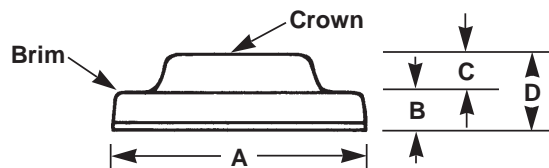
- The depth of the recess cavity should be equal to or deeper than the height of the brim of the Bumpon product.
- The base diameter of the crown should be approximately 60-80% of the diameter of the brim of the Bumpon product.

Custom Colors

3M can match most colors to your specifications.

*Top Hat Design
 Dimension Tolerances*

Dimension tolerances for Top Hat Design Products are as follows:



A	Diameter of Brim, inches (mm)	± 0.005 (0.13)
B	Height of Brim, inches (mm)	± 0.015 (0.38)
C	Height of Crown, inches (mm)	± 0.005 (0.13)
D	Total Height, inches (mm)	± 0.015 (0.38)

Note: Custom Design-A-Bump products may require a qualifying minimum order quantity and a one-time set-up charge. Call your local 3M Industrial Tape and Specialties Division Sales Representative for more information about capabilities and special requirements of the Design-A-Bump Program.

**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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