



Bumpon[™] Protective Products

Resilient Rollstock

5600•5900•6000•6200 Series

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Technical Data

May, 1997

Product Description Bumpon Resilient Rollstock Products are polyurethane sheet materials produced with aggressive pressure sensitive adhesives.

5800 series – 65 durometer polyurethane with a natural rubber (R-30) adhesive.

| | | |
|---------|----------|--------|
| SJ-5832 | 1/32 in. | 0.8 mm |
| SJ-5816 | 1/16 in. | 1.6 mm |
| SJ-5808 | 1/8 in. | 3.2 mm |

5900 series – 32 durometer polyurethane foam with an acrylic (R-20) adhesive.

| | | |
|---------|----------|--------|
| SJ-5916 | 1/32 in. | 1.6 mm |
| SJ-5908 | 1/16 in. | 3.2 mm |
| SJ-5904 | 1/8 in. | 6.4 mm |

6000 series – 65 durometer polyurethane with an acrylic (R-20) adhesive.

| | | |
|---------|----------|--------|
| SJ-6032 | 1/32 in. | 0.8 mm |
| SJ-6016 | 1/16 in. | 1.6 mm |
| SJ-6008 | 1/8 in. | 3.2 mm |

6200 series – 65 durometer polyurethane with a synthetic rubber (R-25) adhesive.

| | | |
|---------|----------|--------|
| SJ-6232 | 1/32 in. | 0.8 mm |
| SJ-6216 | 1/16 in. | 1.6 mm |
| SJ-6208 | 1/8 in. | 3.2 mm |

Features

- Can be die cut to a variety of shapes and sizes.
- Excellent skid-resistance, high coefficient of friction.
- Excellent resistance to marring or staining.*
- Long aging resiliency – will not crack or harden.*
- Excellent cushioning properties.
- Excellent abrasion resistance.
- Vibration and shock damping.
- Easy application – pressure sensitive backing.

* Resulting from a urethane composition which contains no plasticizers.

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Application Ideas

- Die cut to circles or squares for use as skid-resistant feet on computers, calculators, electric housewares, electronic equipment, desk top equipment, etc.
- Die cut for gasket application.
- Skip-resistant surface on floor.
- Cushions or spacers within electronic devices.
- Selective masking for sandblast operation.
- Anti-chafe protection.
- Door kick pads.
- Corner protection strips.
- Roll covering for textile industry and other web feed machinery.

Product Constructions

| | 5800 Series | | | 5900 Series | | | 6000 Series | | | 6200 Series | | |
|---|---|------------------------|-----------------------|--|-----------------------|-----------------------|--|------------------------|-----------------------|--|------------------------|-----------------------|
| | SJ-5808 | SJ-5816 | SJ-5808 | SJ-5916 | SJ-5906 | SJ-5904 | SJ-6032 | SJ-6016 | SJ-6008 | SJ-6232 | SJ-6216 | SJ-6208 |
| Material | Polyurethane | | | Polyurethane Foam | | | Polyurethane | | | Polyurethane | | |
| Release Liner | White 60 lb./ream Silicone coated paper, printed 3M Logo | | | White 80 lb./ream Silicone coated paper, printed 3M Logo | | | White 80 lb./ream Silicone coated paper, printed 3M Logo | | | White 60 lb./ream Silicone coated paper, printed 3M Logo | | |
| Adhesive | R-30 (natural rubber) | | | A-20 (acrylic) | | | A-20 (acrylic) | | | R-30 (natural rubber) | | |
| Color | Black | Black | Black | Black | Black | Black | Black | Black | Black | Black | Black | Black |
| | Brown | Brown | Brown | | | | Brown | Brown | Brown | | | |
| Thickness* | In. 1/32 In. 0.031 (mm) (0.8) | 1/16 0.062 (1.6) | 1/8 0.125 (3.2) | 1/16 0.062 (1.6) | 1/8 0.125 (3.2) | 1/4 0.250 (6.4) | 1/32 0.031 (0.8) | 1/16 0.062 (1.6) | 1/8 0.125 (3.2) | 1/32 0.031 (0.8) | 1/16 0.062 (1.6) | 1/8 0.125 (3.2) |
| * ASTM D-3767 procedure A (3.2 psi) measured without liner. | | | | | | | | | | | | |
| Thickness | ± in. 0.005 | 0.007 | 0.010 | 0.010 | 0.015 | 0.020 | 0.005 | 0.007 | 0.010 | 0.005 | 0.007 | 0.010 |
| Tolerance | ± (mm) (0.13) | (0.18) | (0.25) | (0.25) | (0.38) | (0.50) | (0.13) | (0.18) | (0.25) | (0.13) | (0.18) | (0.25) |
| Roll Length | | | | | | | | | | | | |
| Roll Width | Non-standard sizes may be subject to minimum order requirements | | | | | | | | | | | |
| Standard | In. 4.5 (mm) (114.3) | 4.5 (114.3) | 4.5 (114.3) | 4.5 (114.3) | 4.5 (114.3) | 4.5 (114.3) | 4.5 (114.3) | 4.5 (114.3) | 4.5 (114.3) | 4.5 (114.3) | 4.5 (114.3) | 4.5 (114.3) |
| Minimum | In. 0.5 (mm) (12.7) | 0.5 (12.7) | 1 (25.4) | 0.5 (12.7) | 0.5 (12.7) | 1 (25.4) | 0.5 (12.7) | 0.5 (12.7) | 1 (25.4) | 0.5 (12.7) | 0.5 (12.7) | 1 (25.4) |
| Maximum | In. 13.5 (mm) (342.9) | 13.5 (342.9) | 13.5 (342.9) | 13.5 (342.9) | 13.5 (342.9) | 13.5 (342.9) | 13.5 (342.9) | 13.5 (342.9) | 13.5 (342.9) | 13.5 (342.9) | 9 (228.6) | 9 (228.6) |
| Slitting Tolerance | ± in. 1/32 ± in. 0.031 ± (mm) 0.8 | 1/32 0.031 0.8 | | 1/32 0.031 0.8 | | | 1/32 0.031 0.8 | 1/32 0.031 0.8 | | 1/32 0.031 0.8 | | |

Special Products of the Design-A-Bump Program

Custom Thickness

3M can customize thickness to your specifications.

Note: The capability range for 5800, 6000, and 6200 series Rollstock is 1/32 in. minimum and 1/4 in. maximum.

The capability range for 5900 series Rollstock is 1/16 in. minimum and 5/16 in. maximum.

Custom Color

3M can match most colors to your specifications.

Note: Special products require a qualifying minimum and one-time color matching charge. Call your local 3M industrial Tape and Specialties Division Sales Representative for more information about special products of the Design-A-Bump Program.

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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.

| Property | Test Method | Rollstock Series | | | |
|--|-----------------------------------|------------------|--------------|-------------|-------------|
| | | 5800 | 5900 | 6000 | 6200 |
| Hardness, Shore A | ASTM-D-2240 | 60-70 | 32-40 | 60-70 | 60-70 |
| Approximate Density, lb.ft. ³ (g/cm ³) | | 80 (1.3) | 40 (0.64) | 80 (1.3) | 80 (1.3) |
| Resilience, % | ASTM-D-2632 (0.125 in. sample) | 28-34 | 18-20 | 28-34 | 28-34 |
| *Kinetic Coefficient of Friction | ASTM-D-1894 | | | | |
| | Stainless Steel | >1 | >1 | >1 | >1 |
| | Glass | >1 | >1 | >1 | >1 |
| | Formica® laminate | 0.9-1.4 | 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 | 0.9-1.4 |

* Two important laws of friction applicable to Bumpon brand 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 to cause surface sliding is also doubled. This is expressed mathematically as follows:

$$\text{Sliding force} = (\text{kinetic coefficient of friction}) \times (\text{weight})$$

| | | | | | |
|---|---|--------------------------------|--------------|---------------|---------------|
| Abrasion Resistance Taber H 18, 1kg, g/1000 cycles | ASTM-C-501 | 1.7-1.9 | 1.8-2.0 | 1.7-1.9 | 1.7-1.9 |
| Tensile lb./IN. ² (kPa) | ASTM-D-412, Die A | 600 (4140) | 120 (830) | 600 (4140) | 600 (4140) |
| Elongation, % | ASTM-D-412, Die A | 100 | 100 | 100 | 100 |
| Compression Set, % | ASTM-D-1056 22 hrs, @ 70°F | - | 12 | - | - |
| | (50% deflection) 22 hrs, @ 158°F | - | 14 | - | - |
| | ASTM-D-395 22 hrs, @ 70°F | 3 | - | 3 | 3 |
| | (25% deflection) 22 hrs, @ 158°F | 4 | - | 4 | 4 |
| Dielectric Strength, volts/mil | ASTM-D-1000 | 200 | 140 | 200 | 200 |
| Stain Resistance | 3M-24 hrs. @ 158°F against white paint, 7days exposed to UV | no staining observed | | | |
| Flammability Listing | UL94HB | UL staining observed | | | |
| Ozone and Oxygen Resistance | 3M-30 days @ 50 ppm ozone | no visual deterioration | | | |
| Solvent and Fuel Resistance | 3M-24hr. immersion | | | | |
| | 5% Detergent in water | no apparent effect | | | |
| | 25% Ammonia in water | no apparent effect | | | |
| | Bleach | no apparent effect | | | |
| | Hydrochloric Acid(1Normal Solution) | no apparent effect | | | |
| | Diesel Fuel | no apparent effect | | | |
| | Auto Oil | sight effect(swelling) | | | |
| | Isopropyl Alcohol | sight effect(swelling) | | | |
| | Heptane | considerable effect (swelling) | | | |
| | Toluol | considerable effect (swelling) | | | |
| Lacquer Thinner | | | | | |

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Load Tolerance The “recommended” maximum load which 5800,6000, and 6200 series Rollstock will support is 100 psi(600 kPa) at 70°F (21 °C) to 120°F(49 °C).

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.

Environmental Performance Resilient Rollstock is intended for interior applications where resilience and all other physical properties will remain unchanged. When exposed to UV light for extended periods, some discoloration may occur. Resilient Rollstock may be used outdoors in a protected area with some discoloration and chalking possible.

Relative Adhesive Performance Characteristics

The following table provides relative adhesive performance characteristics of the adhesive systems used in the construction of 5800, 5900, 6000, and 6200 series Rollstock products.

| | 5800 series | 5900 series 6000 series | 6200 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 |
| Initial Adhesion | | | |
| Low Surface Energy | Good | Poor | Excellent |
| High Surface Energy | Good | Fair | Excellent |
| Solvent Resistance | Good | Excellent | Good |
| Age Life | Good | Excellent | Good |

Application Information Application Temperature 40°F(5 °C) to 125°F(52 °C)
 Service Temperature -30°F(-34 °C) to 150°F(66 °C)
 225°F(107 °C) intermittent exposure

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. **Note:** Be sure to follow the solvent manufacturer’s precautions and directions for use when using solvents.
- 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 : Product selection is ultimately the user’s responsibility. Users should conduct their own tests under actual use and storage conditions to determine whether product is fit for a particular purpose and user’s method of application.

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Adhesive Description

Natural Rubber (R-30) – Used in the construction of 5800 series products. This 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 (see Figure below on Static Shear Strength)

Acrylic (A-20) – Used in construction of 5900 and 6000 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 6200 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 surface including many low surface energy surfaces such as polypropylene, polyethylene, and powder coated paints. This adhesive system shows reduced shear properties at elevated temperatures (see Figure below on Stear Strength)

Adhesive Performance

The following figure on static shear and table on peel adhesion provide representative performance characteristics of the adhesive systems used in the construction of 5800, 5900, 6000, and 6200 series Rollstock products.

Static Shear Strength

3M Test Method – Inclined Plane Static Shear Test Method ; 30 ° incline, tested on ABS using 1/2 inch diameter die cuts from SJ-5816, SJ-6016, and SJ-6216 Rollstock products. 2 lb. Load per 1/2 inch diameter die cut. Measured time of creep: 15 monutes.

90 ° Peel Adhesion

Peel Force, oz. Per 1/2 inch

| Substate | 5900 series | | |
|-----------------|------------------------|-----------------|--------------------------|
| | 5800 series | 6000 series | 6200 series |
| | Natural Rubber R-30 | Acrylic A-20 | Synthetic Rubber R-25 |
| Polypropylene | 25 | 3 | 52 |
| Polystyrene | 25 | 11 | 55 |
| ABS | 25 | 25 | 55 |
| Stainless Steel | 22 | 25 | 55 |
| Aluminum | 22 | 25 | 55 |

Note : This technical information and data should be considered representative or typical only and should not be used for specification purposes

Die Cut Examples

Bumpon Rollstock products can be die cut to a variety of shapes and sizes. The following examples illustrate just a few of the possibilities.

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For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-800-227-5085. Address correspondence to : 3M, Industrial Tape and Specialties Division, 3M Center, Building 220-8E-04, St. Paul, MN 55411-1000. Our fax number is 612-733-9175. in Canada, phone: 1-519-451-2500. in Puerto Rico, phone:1-809-750-3000. in Mexico. Phone: 5-728-0400.

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If the 3M product is proved to be defective, THE EXCLUSIVE REMEDY, AT 3M'S OPTION, SHALL BE TO REFUND THE PURCHASE PRICE OF OR TO REPAIR OR REPLACE THE DEFECTIVE 3M PRODUCT. 3M shall not otherwise be liable for loss or damages, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including negligence, warranty, or strict liability.



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