

# Santoprene™ 111-45

## Thermoplastic Vulcanizate

### Product Description

A soft, black, versatile thermoplastic vulcanizate (TPV) in the thermoplastic elastomer (TPE) family. This material combines good physical properties and chemical resistance for use in a wide range of injection molding applications. This grade of Santoprene TPV is shear-dependent and can be processed on conventional thermoplastics equipment for injection molding. It is polyolefin based and recyclable within the manufacturing stream.

### Key Features

- Recommended for applications requiring excellent flex fatigue resistance.
- Excellent ozone resistance.
- UL listed: file #QMFZ2.E80017, Plastics - Component; file #QMFZ8.E80017, Plastics Certified For Canada - Component.
- Used in sealing applications.

### General

|                              |                                                                                                                                                                                                                                    |                                                                                                                                                                             |                                                                                                                                 |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Applications                 | <ul style="list-style-type: none"><li>▪ Automotive - Air Filter Gaskets</li><li>▪ Automotive - HVAC Flapper Door Seals</li><li>▪ Automotive - Motor Brush Holders</li><li>▪ Automotive - Plugs, Bumpers, Grommets, Clips</li></ul> | <ul style="list-style-type: none"><li>▪ Automotive - Seals and Gaskets</li><li>▪ Consumer - Electronics</li><li>▪ Consumer - Floor Care</li><li>▪ General Purpose</li></ul> | <ul style="list-style-type: none"><li>▪ Home &amp; Garden</li><li>▪ Industrial - Seals and Gaskets</li><li>▪ Printers</li></ul> |
| Uses                         | <ul style="list-style-type: none"><li>▪ Automotive Applications</li><li>▪ Cell Phones</li><li>▪ Consumer Applications</li></ul>                                                                                                    | <ul style="list-style-type: none"><li>▪ Gaskets</li><li>▪ Industrial Applications</li><li>▪ Printer Parts</li></ul>                                                         | <ul style="list-style-type: none"><li>▪ Seals</li></ul>                                                                         |
| Agency Ratings               | <ul style="list-style-type: none"><li>▪ UL QMFZ2</li></ul>                                                                                                                                                                         | <ul style="list-style-type: none"><li>▪ UL QMFZ8</li></ul>                                                                                                                  |                                                                                                                                 |
| RoHS Compliance              | <ul style="list-style-type: none"><li>▪ RoHS Compliant</li></ul>                                                                                                                                                                   |                                                                                                                                                                             |                                                                                                                                 |
| Automotive Specifications    | <ul style="list-style-type: none"><li>▪ CHRYSLER MS-AR-100 BMN</li></ul>                                                                                                                                                           | <ul style="list-style-type: none"><li>▪ FORD WSD-M2D378-A4</li></ul>                                                                                                        |                                                                                                                                 |
| UL File Number               | <ul style="list-style-type: none"><li>▪ E80017</li></ul>                                                                                                                                                                           |                                                                                                                                                                             |                                                                                                                                 |
| Color                        | <ul style="list-style-type: none"><li>▪ Black</li></ul>                                                                                                                                                                            |                                                                                                                                                                             |                                                                                                                                 |
| Form(s)                      | <ul style="list-style-type: none"><li>▪ Pellets</li></ul>                                                                                                                                                                          |                                                                                                                                                                             |                                                                                                                                 |
| Processing Method            | <ul style="list-style-type: none"><li>▪ Injection Molding</li></ul>                                                                                                                                                                | <ul style="list-style-type: none"><li>▪ Multi Injection Molding</li></ul>                                                                                                   |                                                                                                                                 |
| Physical                     | Typical Value (English)                                                                                                                                                                                                            | Typical Value (SI)                                                                                                                                                          | Test Based On                                                                                                                   |
| Density / Specific Gravity   | 0.960                                                                                                                                                                                                                              | 0.960                                                                                                                                                                       | ASTM D792                                                                                                                       |
| Density                      | 0.960 g/cm³                                                                                                                                                                                                                        | 0.960 g/cm³                                                                                                                                                                 | ISO 1183                                                                                                                        |
| Hardness                     | Typical Value (English)                                                                                                                                                                                                            | Typical Value (SI)                                                                                                                                                          | Test Based On                                                                                                                   |
| Shore Hardness               |                                                                                                                                                                                                                                    |                                                                                                                                                                             | ISO 868                                                                                                                         |
| Shore A, 15 sec, 73°F (23°C) | 49                                                                                                                                                                                                                                 | 49                                                                                                                                                                          |                                                                                                                                 |



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| Elastomers                                                                    | Typical Value (English)         | Typical Value (SI)   | Test Based On |
|-------------------------------------------------------------------------------|---------------------------------|----------------------|---------------|
| Tensile Stress at 100% - Across Flow (73°F (23°C))                            | 203 psi                         | 1.40 MPa             | ASTM D412     |
| Tensile Stress at 100% - Across Flow (73°F (23°C))                            | 203 psi                         | 1.40 MPa             | ISO 37        |
| Tensile Strength at Break - Across Flow (73°F (23°C))                         | 508 psi                         | 3.50 MPa             | ASTM D412     |
| Tensile Stress at Break - Across Flow (73°F (23°C))                           | 508 psi                         | 3.50 MPa             | ISO 37        |
| Elongation at Break - Across Flow (73°F (23°C))                               | 340 %                           | 340 %                | ASTM D412     |
| Tensile Strain at Break - Across Flow (73°F (23°C))                           | 340 %                           | 340 %                | ISO 37        |
| Compression Set<br>73°F (23°C), 22 hr, Type 1<br>257°F (125°C), 70 hr, Type 1 | 11 %<br>35 %                    | 11 %<br>35 %         | ASTM D395B    |
| Compression Set<br>73°F (23°C), 22 hr, Type A<br>257°F (125°C), 70 hr, Type A | 11 %<br>35 %                    | 11 %<br>35 %         | ISO 815       |
| Thermal                                                                       | Typical Value (English)         | Typical Value (SI)   | Test Based On |
| Brittleness Temperature                                                       | -80 °F                          | -62 °C               | ASTM D746     |
| Brittleness Temperature                                                       | -80 °F                          | -62 °C               | ISO 812       |
| Electrical                                                                    | Typical Value (English)         | Typical Value (SI)   | Test Based On |
| Dielectric Strength<br>73°F (23°C), 0.0787 in (2.00 mm)                       | 690 V/mil                       | 27 kV/mm             | ASTM D149     |
| Dielectric Constant<br>73°F (23°C), 0.0780 in (1.98 mm)                       | 2.40                            | 2.40                 | ASTM D150     |
| Dielectric Constant<br>73°F (23°C), 0.0780 in (1.98 mm)                       | 2.40                            | 2.40                 | IEC 60250     |
| Injection                                                                     | Typical Value (English)         | Typical Value (SI)   |               |
| Drying Temperature                                                            | 180 °F                          | 82 °C                |               |
| Drying Time                                                                   | 3.0 hr                          | 3.0 hr               |               |
| Suggested Max Moisture                                                        | 0.080 %                         | 0.080 %              |               |
| Suggested Max Regrind                                                         | 20 %                            | 20 %                 |               |
| Rear Temperature                                                              | 350 to 380 °F                   | 177 to 193 °C        |               |
| Middle Temperature                                                            | 355 to 390 °F                   | 179 to 199 °C        |               |
| Front Temperature                                                             | 355 to 400 °F                   | 179 to 204 °C        |               |
| Nozzle Temperature                                                            | 375 to 445 °F                   | 191 to 229 °C        |               |
| Processing (Melt) Temp                                                        | 380 to 465 °F                   | 193 to 241 °C        |               |
| Mold Temperature                                                              | 50 to 125 °F                    | 10 to 52 °C          |               |
| Injection Rate                                                                | Fast                            | Fast                 |               |
| Back Pressure                                                                 | 50.0 to 100 psi                 | 0.345 to 0.689 MPa   |               |
| Screw Speed                                                                   | 100 to 200 rpm                  | 100 to 200 rpm       |               |
| Clamp Tonnage                                                                 | 3.0 to 5.0 tons/in <sup>2</sup> | 41 to 69 MPa         |               |
| Cushion                                                                       | 0.125 to 0.250 in               | 3.18 to 6.35 mm      |               |
| Screw L/D Ratio                                                               | 16.0:1.0 to 20.0:1.0            | 16.0:1.0 to 20.0:1.0 |               |
| Screw Compression Ratio                                                       | 2.0:1.0 to 2.5:1.0              | 2.0:1.0 to 2.5:1.0   |               |
| Vent Depth                                                                    | 1.0E-3 in                       | 0.025 mm             |               |



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| Aging                                                                 | Typical Value (English) | Typical Value (SI) | Test Based On |
|-----------------------------------------------------------------------|-------------------------|--------------------|---------------|
| Change in Tensile Strength in Air<br>302°F (150°C), 168 hr            | -23 %                   | -23 %              | ASTM D573     |
| Change in Tensile Strength in Air<br>302°F (150°C), 168 hr            | -23 %                   | -23 %              | ISO 188       |
| Change in Ultimate Elongation in Air<br>302°F (150°C), 168 hr         | 26 %                    | 26 %               | ASTM D573     |
| Change in Tensile Strain at Break in Air<br>302°F (150°C), 168 hr     | 26 %                    | 26 %               | ISO 188       |
| Change in Durometer Hardness in Air<br>Shore A, 302°F (150°C), 168 hr | 1.0                     | 1.0                | ASTM D573     |
| Change in Shore Hardness in Air<br>Shore A, 302°F (150°C), 168 hr     | 1.0                     | 1.0                | ISO 188       |
| Flammability                                                          | Typical Value (English) | Typical Value (SI) | Test Based On |
| Flame Rating (0.04 in (1.0 mm))                                       | HB                      | HB                 | UL 94         |

