

# Santoprene™ 111-35

## 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.
- UL listed: file #QMFZ2.E80017, Plastics - Component; file #QMFZ8.E80017, Plastics Certified For Canada - Component.
- Excellent ozone resistance.
- Designed for applications requiring high-flow materials.

### General

|                           |  |  |  |
|---------------------------|--|--|--|
| Availability <sup>1</sup> | <ul style="list-style-type: none"> <li>▪ Africa &amp; Middle East</li> <li>▪ Asia Pacific</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Europe</li> <li>▪ Latin America</li> </ul>                                  | <ul style="list-style-type: none"> <li>▪ North America</li> </ul>                              |
| Applications              | <ul style="list-style-type: none"> <li>▪ Automotive - Plugs, Bumpers, Grommets, Clips</li> <li>▪ Automotive - Seals and Gaskets</li> <li>▪ Consumer - Electronics</li> </ul> | <ul style="list-style-type: none"> <li>▪ General Purpose</li> <li>▪ Printers</li> <li>▪ Seals and Gaskets</li> </ul> | <ul style="list-style-type: none"> <li>▪ Soft Touch Grips</li> <li>▪ Sporting Goods</li> </ul> |
| Uses                      | <ul style="list-style-type: none"> <li>▪ Automotive Applications</li> <li>▪ Cell Phones</li> <li>▪ Construction Applications</li> </ul>                                      | <ul style="list-style-type: none"> <li>▪ Gaskets</li> <li>▪ Printer Parts</li> <li>▪ Seals</li> </ul>                | <ul style="list-style-type: none"> <li>▪ Sporting Goods</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 AMN</li> </ul>   | <ul style="list-style-type: none"> <li>▪ FORD WSD-M2D378-A4</li> </ul>   | <ul style="list-style-type: none"> <li>▪ GM GMW15813 Type 2</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>  |  |
| Revision Date             | <ul style="list-style-type: none"> <li>▪ 06/20/2014</li> </ul>   |  |  |

| Physical                   | Typical Value (English) | Typical Value (SI)      | Test Based On |
|----------------------------|-------------------------|-------------------------|---------------|
| Density / Specific Gravity | 0.930                   | 0.930                   | ASTM D792     |
| Density                    | 0.930 g/cm <sup>3</sup> | 0.930 g/cm <sup>3</sup> | ISO 1183      |

| Hardness                     | Typical Value (English) | Typical Value (SI) | Test Based On |
|------------------------------|-------------------------|--------------------|---------------|
| Shore Hardness               |                         |                    | ISO 868       |
| Shore A, 15 sec, 73°F (23°C) | 38                      | 38                 |               |

| Elastomers  | Typical Value (English) | Typical Value (SI) | Test Based On |
|---|-------------------------|--------------------|---------------|
| Tensile Stress at 100% - Across Flow (73°F (23°C))    | 145 psi                 | 1.00 MPa           | ASTM D412     |
| Tensile Stress at 100% - Across Flow (73°F (23°C))    | 145 psi                 | 1.00 MPa           | ISO 37        |
| Tensile Strength at Break - Across Flow (73°F (23°C)) | 421 psi                 | 2.90 MPa           | ASTM D412     |
| Tensile Stress at Break - Across Flow (73°F (23°C))   | 421 psi                 | 2.90 MPa           | ISO 37        |
| Elongation at Break - Across Flow (73°F (23°C))       | 330 %                   | 330 %              | ASTM D412     |
| Tensile Strain at Break - Across Flow (73°F (23°C))   | 330 %                   | 330 %              | ISO 37        |
| Compression Set                                       |                         |                    | ASTM D395B    |
| 73°F (23°C), 22 hr, Type 1                            | 10 %                    | 10 %               |               |
| 257°F (125°C), 70 hr, Type 1                          | 31 %                    | 31 %               |               |
| Compression Set                                       |                         |                    | ISO 815       |
| 73°F (23°C), 22 hr, Type A                            | 10 %                    | 10 %               |               |
| 257°F (125°C), 70 hr, Type A                          | 31 %                    | 31 %               |               |

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| Thermal                 | Typical Value (English) | Typical Value (SI) | Test Based On |
|-------------------------|-------------------------|--------------------|---------------|
| Brittleness Temperature | -81 °F                  | -63 °C             | ASTM D746     |
| Brittleness Temperature | -81 °F                  | -63 °C             | ISO 812       |

  

| 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<br>20.0:1.0         | 16.0:1.0 to<br>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                |  |

#### Injection Notes

Santoprene™ TPV is incompatible with acetal and PVC. For more information regarding processing and mold design, please consult our Injection Molding Guide.

| Aging   | Typical Value (English) | Typical Value (SI) | Test Based On |
|---|-------------------------|--------------------|---------------|
| Change in Tensile Strength in Air<br>302°F (150°C), 168 hr            | -29 %                   | -29 %              | ASTM D573     |
| Change in Tensile Strength in Air<br>302°F (150°C), 168 hr            | -29 %                   | -29 %              | ISO 188       |
| Change in Ultimate Elongation in Air<br>302°F (150°C), 168 hr         | -1.0 %                  | -1.0 %             | ASTM D573     |
| Change in Tensile Strain at Break in Air<br>302°F (150°C), 168 hr     | -1.0 %                  | -1.0 %             | 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 (0.06 in (1.5 mm)) | HB                      | HB                 | UL 94         |

#### Additional Information

Where applicable, test results based on fan gated, 2.0 mm injection molded plaques. Tensile strength, elongation and tensile stress are measured across the flow direction. Test results are generated by ExxonMobil test methods that may not fully conform to the ASTM and/or ISO methods. Test methods are available upon request. Compression set at 25% deflection. All products purchased directly from an ExxonMobil affiliate in Europe are REACH compliant. For products not imported into Europe by ExxonMobil, customers should assess their legal responsibilities under REACH.

#### Legal Statement

This product, including the product name, shall not be used or tested in any medical application without the prior written acknowledgement of ExxonMobil Chemical as to the intended use. For detailed Product Stewardship information, please contact Customer Service.

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### Processing Statement

Desiccant drying for 3 hours at 80°C (180°F) is recommended. Santoprene™ TPV has a wide temperature processing window from 175 to 230°C (350 to 450°F) and is incompatible with acetal and PVC. For more information, please consult our Safety Data Sheet and Injection Molding Guide.

### Notes

Typical properties: these are not to be construed as specifications.

<sup>1</sup> Product may not be available in one or more countries in the identified Availability regions. Please contact your Sales Representative for complete Country Availability.

For additional technical, sales and order assistance: [www.exxonmobilchemical.com/ContactUs](http://www.exxonmobilchemical.com/ContactUs)

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