

# Santoprene™ 101-87

## Thermoplastic Vulcanizate

### Product Description

A hard, 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 applications. This grade of Santoprene TPV is shear-dependent and can be processed on conventional thermoplastics equipment for injection molding, extrusion, blow molding, thermoforming or vacuum forming. It is polyolefin based and recyclable within the manufacturing stream.

### Key Features

- UL listed: file #QMFZ2.E80017, Plastics - Component; file #QMFZ8.E80017, Plastics Certified For Canada - Component; file #QMTT2.E86313, Polymeric Materials for Use in Wire, Cable and Flexible Lighting Products - Component.
- Recommended for applications requiring excellent flex fatigue resistance.
- Excellent ozone resistance.

### General

|                           |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                 |                                                                                                                  |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Applications              | <ul style="list-style-type: none"> <li>Appliance - Feet</li> <li>Automotive - Air Induction System Ducts</li> <li>Automotive - Boots and Bellows for Steering and Suspension</li> <li>Automotive - Plugs, Bumpers, Grommets, Clips</li> <li>Automotive - Seals and Gaskets</li> <li>Consumer - Electronics</li> <li>Consumer - Feet</li> </ul> |                                                                                                                                                                 |                                                                                                                  |
| Uses                      | <ul style="list-style-type: none"> <li>Appliance Components</li> <li>Automotive Applications</li> <li>Automotive Under the Hood</li> </ul>                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>Consumer Applications</li> <li>Diaphragms</li> <li>Electrical Parts</li> </ul>                                           | <ul style="list-style-type: none"> <li>Living Hinges</li> <li>Outdoor Applications</li> <li>Tubing</li> </ul>    |
| Agency Ratings            | UL QMFZ2                                                                                                                                                                                                                                                                                                                                       | UL QMFZ8                                                                                                                                                        | UL QMTT2                                                                                                         |
| RoHS Compliance           | RoHS Compliant                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                 |                                                                                                                  |
| Automotive Specifications | CHRYSLER MS-AR-100 EGN                                                                                                                                                                                                                                                                                                                         | FORD WSD-M2D382-A1                                                                                                                                              | GM GMW15813 Type 8                                                                                               |
| UL File Number            | E86313                                                                                                                                                                                                                                                                                                                                         | E80017                                                                                                                                                          |                                                                                                                  |
| Color                     | Black                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                 |                                                                                                                  |
| Form(s)                   | Pellets                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                 |                                                                                                                  |
| Processing Method         | <ul style="list-style-type: none"> <li>Blow Molding</li> <li>Coextrusion</li> <li>Extrusion</li> <li>Extrusion Blow Molding</li> </ul>                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>Injection Blow Molding</li> <li>Injection Molding</li> <li>Multi Injection Molding</li> <li>Profile Extrusion</li> </ul> | <ul style="list-style-type: none"> <li>Sheet Extrusion</li> <li>Thermoforming</li> <li>Vacuum Forming</li> </ul> |

| Physical                   | Typical Value (English) | Typical Value (SI)      | Test Based On |
|----------------------------|-------------------------|-------------------------|---------------|
| Density / Specific Gravity | 0.950                   | 0.950                   | ASTM D792     |
| Density                    | 0.950 g/cm <sup>3</sup> | 0.950 g/cm <sup>3</sup> | ISO 1183      |
| Outdoor Suitability        | f1                      | f1                      | UL 746C       |
| Detergent Resistance       | f3                      | f3                      | UL 749        |
| Detergent Resistance       | f4                      | f4                      | UL 2157       |

| Hardness                     | Typical Value (English) | Typical Value (SI) | Test Based On |
|------------------------------|-------------------------|--------------------|---------------|
| Shore Hardness               |                         |                    | ISO 868       |
| Shore A, 15 sec, 73°F (23°C) | 94                      | 94                 |               |



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| Elastomers                                                                     | Typical Value (English) | Typical Value (SI) | Test Based On |
|--------------------------------------------------------------------------------|-------------------------|--------------------|---------------|
| Tensile Stress at 100% - Across Flow (73°F (23°C))                             | 1010 psi                | 6.93 MPa           | ASTM D412     |
| Tensile Stress at 100% - Across Flow (73°F (23°C))                             | 1010 psi                | 6.93 MPa           | ISO 37        |
| Tensile Strength at Break - Across Flow (73°F (23°C))                          | 2260 psi                | 15.6 MPa           | ASTM D412     |
| Tensile Stress at Break - Across Flow (73°F (23°C))                            | 2260 psi                | 15.6 MPa           | ISO 37        |
| Elongation at Break - Across Flow (73°F (23°C))                                | 600 %                   | 600 %              | ASTM D412     |
| Tensile Strain at Break - Across Flow (73°F (23°C))                            | 600 %                   | 600 %              | ISO 37        |
| Tear Strength - Across Flow<br>73°F (23°C), Method Ba, Angle (Unnicked)        | 290 lbf/in              | 51 kN/m            | ISO 34-1      |
| Compression Set<br>158°F (70°C), 22 hr, Type 1<br>257°F (125°C), 70 hr, Type 1 | 37 %<br>52 %            | 37 %<br>52 %       | ASTM D395B    |
| Compression Set<br>158°F (70°C), 22 hr, Type A<br>257°F (125°C), 70 hr, Type A | 37 %<br>52 %            | 37 %<br>52 %       | ISO 815       |
| Thermal                                                                        | Typical Value (English) | Typical Value (SI) | Test Based On |
| Brittleness Temperature                                                        | -65 °F                  | -54 °C             | ASTM D746     |
| Brittleness Temperature                                                        | -65 °F                  | -54 °C             | ISO 812       |
| RTI Elec                                                                       | 194 °F                  | 90.0 °C            | UL 746        |
| RTI Str                                                                        |                         |                    | UL 746        |
| 0.04 in (1.0 mm)                                                               | 194 °F                  | 90.0 °C            |               |
| 0.06 in (1.5 mm)                                                               | 194 °F                  | 90.0 °C            |               |
| 0.12 in (3.0 mm)                                                               | 203 °F                  | 95.0 °C            |               |
| Electrical                                                                     | Typical Value (English) | Typical Value (SI) | Test Based On |
| Dielectric Strength<br>73°F (23°C), 0.0787 in (2.00 mm)                        | 750 V/mil               | 30 kV/mm           | ASTM D149     |
| Dielectric Constant<br>73°F (23°C), 0.0780 in (1.98 mm)                        | 2.60                    | 2.60               | ASTM D150     |
| Dielectric Constant<br>73°F (23°C), 0.0780 in (1.98 mm)                        | 2.60                    | 2.60               | IEC 60250     |
| Comparative Tracking Index (CTI)                                               | PLC 0                   | PLC 0              | UL 746        |
| High Amp Arc Ignition (HAI)                                                    | PLC 0                   | PLC 0              | UL 746        |
| High Voltage Arc Resistance to Ignition (HVAR)                                 | PLC 5                   | PLC 5              | UL 746        |
| High Voltage Arc Tracking Rate (HVTR)                                          | PLC 1                   | PLC 1              | UL 746        |
| Hot-wire Ignition (HWI)                                                        |                         |                    | UL 746        |
| 0.04 in (1.0 mm)                                                               | PLC 4                   | PLC 4              |               |
| 0.06 in (1.5 mm)                                                               | PLC 3                   | PLC 3              |               |
| 0.12 in (3.0 mm)                                                               | PLC 2                   | PLC 2              |               |



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| 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        | 360 °F                          | 182 °C               |
| Middle Temperature      | 370 °F                          | 188 °C               |
| Front Temperature       | 380 °F                          | 193 °C               |
| Nozzle Temperature      | 390 to 455 °F                   | 199 to 235 °C        |
| Processing (Melt) Temp  | 400 to 450 °F                   | 204 to 232 °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             |

#### Injection Notes

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

| Extrusion          | Typical Value (English) | Typical Value (SI) |
|--------------------|-------------------------|--------------------|
| Drying Temperature | 180 °F                  | 82 °C              |
| Drying Time        | 3.0 hr                  | 3.0 hr             |
| Melt Temperature   | 400 °F                  | 204 °C             |
| Die Temperature    | 410 °F                  | 210 °C             |
| Back Pressure      | 725 to 2900 psi         | 5.00 to 20.0 MPa   |

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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            | -11 %                   | -11 %              | ASTM D573     |
| Change in Tensile Strength in Air<br>302°F (150°C), 168 hr            | -11 %                   | -11 %              | ISO 188       |
| Change in Ultimate Elongation in Air<br>302°F (150°C), 168 hr         | -18 %                   | -18 %              | ASTM D573     |
| Change in Tensile Strain at Break in Air<br>302°F (150°C), 168 hr     | -18 %                   | -18 %              | ISO 188       |
| Change in Durometer Hardness in Air<br>Shore A, 302°F (150°C), 168 hr | 0.90                    | 0.90               | ASTM D573     |
| Change in Shore Hardness in Air<br>Shore A, 302°F (150°C), 168 hr     | 0.90                    | 0.90               | ISO 188       |
| Continuous Upper Temperature Resistance<br>1008 hr                    | 275 °F                  | 135 °C             | SAE J2236     |

| Flammability     | Typical Value (English) | Typical Value (SI) | Test Based On |
|------------------|-------------------------|--------------------|---------------|
| Flame Rating     |                         |                    | UL 94         |
| 0.04 in (1.0 mm) | HB                      | HB                 |               |
| 0.06 in (1.5 mm) | HB                      | HB                 |               |
| 0.12 in (3.0 mm) | HB                      | HB                 |               |