

# Santoprene™ 203-40

## Thermoplastic Vulcanizate

| Product Description   | Key Features   |
|---|--|
| A hard, colorable, 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 completely recyclable. | <ul style="list-style-type: none"> <li>UL listed: file #QMFZ2.E80017, Plastics - Component; file #QMFZ8.E80017, Plastics Certified For Canada - Component.</li> <li>Excellent ozone resistance.</li> <li>EU and China RoHS compliant.</li> </ul> |

| 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> <li>South America</li> </ul>                           |
| Applications              | <ul style="list-style-type: none"> <li>Automotive - Boots and Bellows for Steering and Suspension</li> <li>Automotive - Plugs, Bumpers, Grommets, Clips</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>Tubing</li> </ul>                                  |
| Agency Ratings            | <ul style="list-style-type: none"> <li>EU Annex XVII of Regulation (EC) No 1907/2006</li> </ul>  | <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-AR100 FGN</li> <li>FORD WSD-M2D441-A</li> </ul>   | <ul style="list-style-type: none"> <li>GM GMP/E/P.006</li> <li>GM GMW15813, Type 9</li> </ul>   |  |
| UL File Number            | <ul style="list-style-type: none"> <li>E80017</li> </ul>   |   |  |
| Color                     | <ul style="list-style-type: none"> <li>Natural Color</li> </ul>  |   |  |
| Form(s)                   | <ul style="list-style-type: none"> <li>Pellets</li> </ul>  |   |  |
| 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> |
| Revision Date             | <ul style="list-style-type: none"> <li>08/30/2012</li> </ul>   |   |  |

| Physical             | Typical Value (English) | Typical Value (SI)      | Test Based On |
|----------------------|-------------------------|-------------------------|---------------|
| 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      |
| 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 D, 15 sec, 73°F (23°C), 0.0787 in (2.00 mm) | 41                      | 41                 |               |

| Elastomers   | Typical Value (English) | Typical Value (SI) | Test Based On |
|--|-------------------------|--------------------|---------------|
| Tensile Stress at 100% - Across Flow (73°F (23°C)) | 1310 psi                | 9.00 MPa           | ASTM D412     |

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

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**ExxonMobil Chemical Santoprene™ 203-40**  
**Thermoplastic Vulcanizate**

| <b>Elastomers</b>   | <b>Typical Value (English)</b> | <b>Typical Value (SI)</b> | <b>Test Based On</b> |
|---|--------------------------------|---------------------------|----------------------|
| Tensile Stress at 100% - Across Flow (73°F (23°C))                    | 1310 psi                       | 9.00 MPa                  | ISO 37               |
| Tensile Strength at Break - Across Flow (73°F (23°C))                 | 3000 psi                       | 20.7 MPa                  | ASTM D412            |
| Tensile Stress at Break - Across Flow (73°F (23°C))                   | 3000 psi                       | 20.7 MPa                  | ISO 37               |
| Elongation at Break - Across Flow (73°F (23°C))                       | 610 %                          | 610 %                     | ASTM D412            |
| Tensile Strain at Break - Across Flow (73°F (23°C))                   | 610 %                          | 610 %                     | ISO 37               |
| Tear Strength - Across Flow (73°F (23°C), Die C)                      | 383 lbf/in                     | 67.0 kN/m                 | ASTM D624            |
| Tear Strength - Across Flow<br>73°F (23°C), Method Bb, Angle (Nicked) | 380 lbf/in                     | 67 kN/m                   | ISO 34-1             |
| Compression Set   |                                |                           | ASTM D395B           |
| 158°F (70°C), 22.0 hr, Type 1   | 54 %                           | 54 %                      |                      |
| 257°F (125°C), 70.0 hr, Type 1  | 61 %                           | 61 %                      |                      |
| Compression Set   |                                |                           | ISO 815              |
| 158°F (70°C), 22.0 hr, Type A   | 54 %                           | 54 %                      |                      |
| 257°F (125°C), 70.0 hr, Type A  | 61 %                           | 61 %                      |                      |

| <b>Thermal</b>          | <b>Typical Value (English)</b> | <b>Typical Value (SI)</b> | <b>Test Based On</b> |
|-------------------------|--------------------------------|---------------------------|----------------------|
| Brittleness Temperature | -62 °F                         | -52 °C                    | ASTM D746            |
| Brittleness Temperature | -62 °F                         | -52 °C                    | ISO 812              |
| RTI Elec                | 185 °F                         | 85.0 °C                   | UL 746               |
| RTI Str                 | 185 °F                         | 85.0 °C                   | UL 746               |

| <b>Electrical</b>                                       | <b>Typical Value (English)</b> | <b>Typical Value (SI)</b> | <b>Test Based On</b> |
|---|--------------------------------|---------------------------|----------------------|
| Dielectric Strength<br>73°F (23°C), 0.0800 in (2.03 mm) | 700 V/mil                      | 28 kV/mm                  | ASTM D149            |
| Dielectric Constant<br>73°F (23°C), 0.0780 in (1.98 mm) | 2.30                           | 2.30                      | ASTM D150            |
| Dielectric Constant<br>73°F (23°C), 0.0780 in (1.98 mm) | 2.30                           | 2.30                      | 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               |
| 0.0394 in (1.00 mm)                                     | PLC 4                          | PLC 4                     |                      |
| 0.0591 in (1.50 mm)                                     | PLC 3                          | PLC 3                     |                      |
| 0.118 in (3.00 mm)                                      | PLC 2                          | PLC 2                     |                      |

| <b>Injection</b>       | <b>Typical Value (English)</b> | <b>Typical Value (SI)</b> |
|------------------------|--------------------------------|---------------------------|
| Drying Temperature     | 180 °F                         | 82.2 °C                   |
| Drying Time            | 3.0 hr                         | 3.0 hr                    |
| Suggested Max Moisture | 0.080 %                        | 0.080 %                   |
| Suggested Max Re grind | 20 %                           | 20 %                      |

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| <b>Injection</b>        | <b>Typical Value (English)</b>  | <b>Typical Value (SI)</b> |
|-------------------------|---------------------------------|---------------------------|
| Rear Temperature        | 380 °F                          | 193 °C                    |
| Middle Temperature      | 390 °F                          | 199 °C                    |
| Front Temperature       | 400 °F                          | 204 °C                    |
| Nozzle Temperature      | 410 to 460 °F                   | 210 to 238 °C             |
| Processing (Melt) Temp  | 420 to 450 °F                   | 216 to 232 °C             |
| Mold Temperature        | 50.0 to 125 °F                  | 10.0 to 51.7 °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              | 0.0010 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.

| <b>Extrusion</b>   | <b>Typical Value (English)</b> | <b>Typical Value (SI)</b> |
|--------------------|--------------------------------|---------------------------|
| Drying Temperature | 180 °F                         | 82.2 °C                   |
| Drying Time        | 3.0 hr                         | 3.0 hr                    |
| Melt Temperature   | 410 °F                         | 210 °C                    |
| Die Temperature    | 420 °F                         | 216 °C                    |
| Back Pressure      | 725 to 2900 psi                | 5.00 to 20.0 MPa          |

**Extrusion Notes**

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

| <b>Aging</b>  | <b>Typical Value (English)</b> | <b>Typical Value (SI)</b> | <b>Test Based On</b> |
|---|--------------------------------|---------------------------|----------------------|
| 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         | -15 %                          | -15 %                     | ASTM D573            |
| Change in Tensile Strain at Break in Air<br>302°F (150°C), 168 hr     | -15 %                          | -15 %                     | ISO 188              |
| Change in Durometer Hardness in Air<br>Shore D, 302°F (150°C), 168 hr | 4.0                            | 4.0                       | ASTM D573            |
| Change in Shore Hardness in Air<br>Shore D, 302°F (150°C), 168 hr     | 4.0                            | 4.0                       | ISO 188              |

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# ExxonMobil Chemical Santoprene™ 203-40 Thermoplastic Vulcanizate

| Flammability        | Typical Value (English) | Typical Value (SI) | Test Based On |
|---------------------|-------------------------|--------------------|---------------|
| Flame Rating        |                         |                    | UL 94         |
| 0.0394 in (1.00 mm) | HB                      | HB                 |               |
| 0.0591 in (1.50 mm) | HB                      | HB                 |               |
| 0.118 in (3.00 mm)  | HB                      | HB                 |               |

## Additional Information

Values are for injection molded plaques, fan-gated, 102.0 mm x 152.0 mm x 2.0 mm (4.000" x 6.000" x 0.080").  
Tensile strength, elongation and tensile stress are measured across the flow direction - ISO type 1, ASTM die C.  
Compression set at 25% deflection.

## Legal Statement

For detailed Product Stewardship information, please contact Customer Service.

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.

## 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 Material Safety Data Sheet, Injection Molding Guide and Extrusion Guide.

## Notes

<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:

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