

Santoprene™ 103-40

Thermoplastic Vulcanizate

ExxonMobil Chemical



Prospector

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 completely recyclable.

General

| | | | |
|-------------------|--|---|--|
| Material Status | • Commercial: Active | | |
| Availability | • Africa & Middle East • Asia Pacific | • Europe • Latin America | • North America • South America |
| Features | • Electrically Insulating • Fatigue Resistant • Good Chemical Resistance | • Good Dimensional Stability • Good Electrical Properties • Good Tear Strength | • Ozone Resistant • Recyclable Material |
| Uses | • Appliance Components • Automotive Applications • Automotive Under the Hood | • Consumer Applications • Diaphragms • Electrical Parts | • Living Hinges • Tubing |
| Agency Ratings | • EU 2003/11/EC | • UL QMFZ2 | • UL QMFZ8 |
| RoHS Compliance | • RoHS Compliant | | |
| Appearance | • Black | | |
| Forms | • Pellets | | |
| Processing Method | • Blow Molding • Coextrusion • Extrusion • Extrusion Blow Molding | • Injection Blow Molding • Injection Molding • Multi Injection Molding • Profile Extrusion | • Sheet Extrusion • Thermoforming • Vacuum Forming |

| Physical | Nominal Value | Unit | Test Method |
|------------------|---------------|-------------------|-------------|
| Specific Gravity | | | |
| -- | 0.948 | g/cm ³ | ASTM D792 |
| -- | 0.950 | g/cm ³ | ISO 1183 |

| Elastomers | Nominal Value | Unit | Test Method |
|--|---------------|------|---------------------|
| Tensile Stress - Across Flow (100% Strain, 23°C) | 9.00 | MPa | ASTM D412 ISO 37 |
| Tensile Strength - Across Flow (Break, 23°C) | 20.7 | MPa | ASTM D412 ISO 37 |
| Tensile Elongation - Across Flow (Break, 23°C) | 610 | % | ASTM D412 ISO 37 |
| Tear Strength - Across Flow | | | |
| 23°C ² | 67.0 | kN/m | ASTM D624 |
| 23°C ³ | 67 | kN/m | ISO 34-1 |
| Compression Set | | | |
| 70°C, 22.0 hr ⁴ | 54 | % | ASTM D395B |
| 125°C, 70.0 hr ⁴ | 61 | % | ASTM D395B |
| 70°C, 22.0 hr ⁵ | 54 | % | ISO 815 |
| 125°C, 70.0 hr ⁵ | 61 | % | ISO 815 |

| Hardness | Nominal Value | Unit | Test Method |
|--------------------------------|---------------|------|-------------|
| Shore Hardness | | | ISO 868 |
| Shore D, 15 sec, 23°C, 2.00 mm | 41 | | |

| Thermal | Nominal Value | Unit | Test Method |
|-------------------------|---------------|------|----------------------|
| Brittleness Temperature | -52.0 | °C | ASTM D746 ISO 812 |

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| Aging | Nominal Value | Unit | Test Method |
|---|---------------|------|-----------------------|
| Change in Tensile Strength in Air | | | ASTM D573 ISO 188 |
| 150°C, 168 hr | -11 | % | |
| Change in Ultimate Elongation in Air | | | ASTM D573 ISO 188 |
| 150°C, 168 hr | -15 | % | |
| Change in Durometer Hardness in Air | | | ASTM D573 ISO 188 |
| Shore D, 150°C, 168 hr | 4.0 | | |
| Change in Tensile Strength | | | ASTM D471 ISO 1817 |
| 23°C, 168 hr, in Acetic Acid | 0.0 | % | |
| 23°C, 168 hr, in Cyclohexane | -2.0 | % | |
| 23°C, 168 hr, in Detergent (Tide), 2.5% | 0.0 | % | |
| 23°C, 168 hr, in Ethanol, 95% | -3.0 | % | |
| 23°C, 168 hr, in Hydrochloric Acid, 10% | 6.0 | % | |
| 23°C, 168 hr, in Isopropyl Alcohol | 5.0 | % | |
| 23°C, 168 hr, in Methyl ethyl ketone | 3.0 | % | |
| 23°C, 168 hr, in Sodium Chloride, 15% | 4.0 | % | |
| 23°C, 168 hr, in Sodium Hydroxide, 50% | 4.0 | % | |
| 23°C, 168 hr, in Sulfuric Acid, 98% | -22 | % | |
| 23°C, 168 hr, in Trichloroethylene | 8.0 | % | |
| 100°C, 168 hr, in Deionized Water | 3.0 | % | |
| 100°C, 168 hr, in IRM 903 Oil | -26 | % | |
| 125°C, 70 hr, in IRM 903 Oil | -27 | % | |
| 125°C, 168 hr, in IRM 903 Oil | -30 | % | |
| Change in Ultimate Elongation | | | ASTM D471 ISO 1817 |
| 23°C, 168 hr, in Acetic Acid | 3.0 | % | |
| 23°C, 168 hr, in Cyclohexane | 2.0 | % | |
| 23°C, 168 hr, in Detergent (Tide), 2.5% | 0.0 | % | |
| 23°C, 168 hr, in Ethanol, 95% | -2.0 | % | |
| 23°C, 168 hr, in Hydrochloric Acid, 10% | 5.0 | % | |
| 23°C, 168 hr, in Isopropyl Alcohol | 5.0 | % | |
| 23°C, 168 hr, in Methyl ethyl ketone | 2.0 | % | |
| 23°C, 168 hr, in Sodium Chloride, 15% | 2.0 | % | |
| 23°C, 168 hr, in Sodium Hydroxide, 50% | 3.0 | % | |
| 23°C, 168 hr, in Sulfuric Acid, 98% | -23 | % | |
| 23°C, 168 hr, in Trichloroethylene | 2.0 | % | |
| 100°C, 168 hr, in Deionized Water | 0.0 | % | |
| 100°C, 168 hr, in IRM 903 Oil | -28 | % | |
| 125°C, 70 hr, in IRM 903 Oil | -33 | % | |
| 125°C, 168 hr, in IRM 903 Oil | -39 | % | |

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| Aging | Nominal Value | Unit | Test Method |
|--|---------------|------|-----------------------|
| Change in Durometer Hardness | | | ASTM D471 ISO 1817 |
| Shore A, 23°C, 168 hr, in Acetic Acid | -1.0 | | |
| Shore A, 23°C, 168 hr, in Cyclohexane | -13 | | |
| Shore A, 23°C, 168 hr, in Detergent (Tide), 2.5% | 0.0 | | |
| Shore A, 23°C, 168 hr, in Ethanol, 95% | 0.0 | | |
| Shore A, 23°C, 168 hr, in Hydrochloric Acid, 10% | -1.0 | | |
| Shore A, 23°C, 168 hr, in Isopropyl Alcohol | 2.0 | | |
| Shore A, 23°C, 168 hr, in Methylenechloride | 0.0 | | |
| Shore A, 23°C, 168 hr, in Sodium Chloride, 15% | 2.0 | | |
| Shore A, 23°C, 168 hr, in Sodium Hydroxide, 50% | 1.0 | | |
| Shore A, 23°C, 168 hr, in Sulfuric Acid, 98% | 2.0 | | |
| Shore A, 23°C, 168 hr, in Trichloroethylene | 1.0 | | |
| Shore A, 100°C, 168 hr, in Deionized Water | 0.0 | | |
| Shore A, 100°C, 168 hr, in IRM 903 Oil | -13 | | |
| Shore A, 125°C, 168 hr, in IRM 903 Oil | -15 | | |
| Change in Mass | | | ASTM D471 |
| 23°C, 168 hr, in Acetic Acid | 1.2 | % | |
| 23°C, 168 hr, in Cyclohexane | -3.4 | % | |
| 23°C, 168 hr, in Detergent (Tide), 2.5% | 0.40 | % | |
| 23°C, 168 hr, in Ethanol, 95% | -0.60 | % | |
| 23°C, 168 hr, in Hydrochloric Acid, 10% | 0.10 | % | |
| 23°C, 168 hr, in Isopropyl Alcohol | -5.0 | % | |
| 23°C, 168 hr, in Methylenechloride | -12 | % | |
| 23°C, 168 hr, in Sodium Chloride, 15% | 0.10 | % | |
| 23°C, 168 hr, in Sodium Hydroxide, 50% | 0.0 | % | |
| 23°C, 168 hr, in Sulfuric Acid, 98% | 1.1 | % | |
| 23°C, 168 hr, in Trichloroethylene | -1.0 | % | |
| 100°C, 168 hr, in Deionized Water | 1.4 | % | |
| 100°C, 168 hr, in IRM 903 Oil | 35 | % | |
| 125°C, 168 hr, in IRM 903 Oil | 44 | % | |
| Change in Mass | | | ISO 1817 |
| 23.0°C, 168 hr, in Methylenechloride | -12 | % | |
| 23.0°C, 168 hr, in Isopropyl Alcohol | -5.0 | % | |
| 23.0°C, 168 hr, in Cyclohexane | -3.4 | % | |
| 23.0°C, 168 hr, in Trichloroethylene | -1.0 | % | |
| 23.0°C, 168 hr, in Ethanol, 95% | -0.60 | % | |
| 23.0°C, 168 hr, in Sodium Hydroxide, 50% | 0.0 | % | |
| 23.0°C, 168 hr, in Hydrochloric Acid, 10% | 0.10 | % | |
| 23.0°C, 168 hr, in Sodium Chloride, 15% | 0.10 | % | |
| 23.0°C, 168 hr, in Detergent (Tide), 2.5% | 0.40 | % | |
| 23.0°C, 168 hr, in Sulfuric Acid, 98% | 1.1 | % | |
| 23.0°C, 168 hr, in Acetic Acid | 1.2 | % | |
| 100°C, 168 hr, in Deionized Water | 1.4 | % | |
| 100°C, 168 hr, in IRM 903 Oil | 35 | % | |
| 125°C, 168 hr, in IRM 903 Oil | 44 | % | |
| Change in Volume | | | ASTM D471 ISO 1817 |
| 125°C, 70 hr, in IRM 903 Oil | 40 | % | |

| Electrical | Nominal Value | Unit | Test Method |
|-------------------------------------|---------------|-------|------------------------|
| Dielectric Strength (2.03 mm) | 34 | kV/mm | ASTM D149 |
| Dielectric Constant (23°C, 1.98 mm) | 2.60 | | ASTM D150 IEC 60250 |

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.

| Injection | Nominal Value | Unit |
|-------------------------|----------------------|--------------------|
| Drying Temperature | 82.2 | °C |
| Drying Time | 3.0 | hr |
| Suggested Max Moisture | 0.080 | % |
| Suggested Max Regrind | 20 | % |
| Rear Temperature | 193 | °C |
| Middle Temperature | 199 | °C |
| Front Temperature | 204 | °C |
| Nozzle Temperature | 210 to 238 | °C |
| Processing (Melt) Temp | 216 to 232 | °C |
| Mold Temperature | 10.0 to 51.7 | °C |
| Injection Rate | Fast | |
| Back Pressure | 0.345 to 0.689 | MPa |
| Screw Speed | 100 to 200 | rpm |
| Clamp Tonnage | 4.1 to 6.9 | kN/cm ² |
| Cushion | 3.18 to 6.35 | mm |
| Screw L/D Ratio | 16.0:1.0 to 20.0:1.0 | |
| Screw Compression Ratio | 2.0:1.0 to 2.5:1.0 | |
| Vent Depth | 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 | Nominal Value | Unit |
|--------------------|---------------|------|
| Drying Temperature | 82.2 | °C |
| Drying Time | 3.0 | hr |
| Melt Temperature | 210 | °C |
| Die Temperature | 216 | °C |
| Back Pressure | 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.

Notes

¹ Typical properties: these are not to be construed as specifications.

² Die C

³ Method Bb, Angle (Nicked)

⁴ Type 1

⁵ Type A