

# Santoprene™ 211-45

## Thermoplastic Vulcanizate

### Product Description

A soft, 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 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

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 - Grips</li> <li>▪ Automotive - Interior Mat</li> </ul>	<ul style="list-style-type: none"> <li>▪ Industrial - Seals and Gaskets</li> <li>▪ Soft Touch Grips</li> </ul>	<ul style="list-style-type: none"> <li>▪ Tubing</li> </ul>
Uses	<ul style="list-style-type: none"> <li>▪ Automotive Applications</li> </ul>	<ul style="list-style-type: none"> <li>▪ Gaskets</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>▪ 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>▪ 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	0.960	0.960	ASTM D792
Density	0.960 g/cm <sup>3</sup>	0.960 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)	49	49	

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			ASTM D395B
73°F (23°C), 22 hr, Type 1	11 %	11 %	
257°F (125°C), 70 hr, Type 1	35 %	35 %	
Compression Set			ISO 815
73°F (23°C), 22 hr, Type A	11 %	11 %	
257°F (125°C), 70 hr, Type A	35 %	35 %	

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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
RTI Elec	212 °F	100 °C	UL 746
RTI Str			UL 746
0.04 in (1.0 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			ASTM D149
73°F (23°C), 0.0787 in (2.00 mm)	770 V/mil	30 kV/mm	
Dielectric Constant			ASTM D150
73°F (23°C), 0.0799 in (2.03 mm)	2.40	2.40	
Dielectric Constant			IEC 60250
73°F (23°C), 0.0799 in (2.03 mm)	2.40	2.40	

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

#### Injection Notes

Santoprene TPV is incompatible with acetal and PVC. An SPI/SPE #3 finish is recommended (do not polish). 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 302°F (150°C), 168 hr	-23 %	-23 %	ASTM D573
Change in Tensile Strength in Air 302°F (150°C), 168 hr	-23 %	-23 %	ISO 188
Change in Ultimate Elongation in Air 302°F (150°C), 168 hr	26 %	26 %	ASTM D573
Change in Tensile Strain at Break in Air 302°F (150°C), 168 hr	26 %	26 %	ISO 188
Change in Durometer Hardness in Air Shore A, 302°F (150°C), 168 hr	1.0	1.0	ASTM D573
Change in Shore Hardness in Air Shore A, 302°F (150°C), 168 hr	1.0	1.0	ISO 188

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

#### 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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