



Santoprene® thermoplastic vulcanizate



Electrical industry: TPV meets the needs of the most demanding electrical applications

Compliant with the latest industry standards and regulations, Santoprene® thermoplastic vulcanizate (TPV) delivers performance and processing benefits to meet the needs of even the most demanding electrical applications.

Reasons to specify Santoprene TPV



Flexibility
Easy installation especially in compact space



Electrical performance
Provides electrical insulation performance in low voltage (<1kV)
UL Yellow Cards available



Versatility
Meets a combination of needs in performance, processing and cost in a broad range of electrical applications



Innovation
Enables new requirements from emerging markets and applications to be achieved

The right product for the right application

For a broad portfolio of solutions designed to meet a wide range of electrical application needs, choose the industry's technology leader -- Santoprene TPV.

Carbon reduction opportunities

- For over 40 years Santoprene® TPV has been helping customers create sustainable solutions by enabling:
- In-process recycling and the potential for recycling at the end of life.
 - Opportunities to reduce part weight and consume less energy during manufacturing versus thermoset rubbers (TSRs)

Plus, the new Santoprene® TPV ECO-R family of grades, which contain a minimum of 15% or 25% PCR, while maintaining quality and lot-to-lot consistency, can reduce the carbon footprint of a part by up to 59%, compared to using EPDM rubber.



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Flexibility

Long-term performance has always been critical for the specification of polymers in electrical applications, but today flexibility is becoming increasingly important too. In consumer applications, such as audio, computer and appliance cables, and in the construction and industrial sectors where underground and sub-marine installation is becoming more common, customers are looking for the combination of long-term performance and flexibility over a wide temperature range.



Weather-tight seal protects critical connections and provides long term performance

Electrical performance

Santoprene® TPV is designed to meet the electrical industry's latest and most demanding performance, environmental, health and safety standards. Low voltage wire and cable insulation and jackets, as well as molded electrical components, strain reliefs and enclosure and splice sealing components, can all benefit from an industry-leading portfolio of Santoprene TPV. These parts are used in a range of industries including utilities, appliance, construction, automotive, robotic, telecom and solar and wind energy.

Versatility

The versatility of Santoprene TPV provides a range of benefits and processing advantages, enabling new ideas to become commercial products at a realistic cost. Whatever the application and wherever customers are located, you can be sure there is a Santoprene TPV grade to meet your electrical application needs.

Part redesign possibilities

Because Santoprene® TPV can be processed like a thermoplastic it enables part redesign which allows:

- System consolidation
- Hard/soft material combinations
- Reduced part weight
- Increased output potential

Innovation

Innovative and cost-effective, Santoprene TPVs are designed to meet customer needs for evolving electrical applications that must comply with the latest regional standards and directives. Ongoing technology development programs and application expertise ensure new solutions meet emerging market trends, such as simplified designs, enhanced electrical performance, increased flexibility, improved processing and lower cost. Offering customers a significant competitive advantage in electrical applications, Santoprene TPV facilitates ongoing innovation across the value chain.



Broad range of electrical applications

Broad portfolio of high performance Santoprene TPV has contributed to the successful development of hundreds of electrical applications including:

Wire & cable

Low-voltage power, robotic wire jacketing, data and communications, instrumentation wire, fiber optics, flexible cords, appliance wires, submersible pump cables, tray cables, heat tracer cables, and co-axial cables insulation.

Connectors & accessories

Airport lighting, automotive, outdoor weather-tight seals, photovoltaic, battery lead terminals, plugs/seals/gaskets/grommets, shields/dust covers, strain reliefs, overmolded splice connectors, telecommunications splice seals, and overmolded antenna.



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Properties	Test method based on	Santoprene® TPV 201-64	Santoprene® TPV 8201-70	Santoprene® TPV 201-73	Santoprene® TPV 101-73	Santoprene® TPV 201-80	Santoprene® TPV 201-87	Santoprene® TPV 203-40	Santoprene® TPV 251-70W232	Santoprene® TPV 151-70W256	Santoprene® TPV 251-80W232	Santoprene® TPV 251-85W232	Santoprene® TPV 251-92W232
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Physical and mechanical properties (Typical values)

Density (g/cc)	ASTM D792	0,970	0,95	0,970	0,970	0,960	0,960	0,950	1,240		1,240	1,150	1,240
Hardness (15 sec) Shore A/D	ISO 868	69A	75A	78A	78,000	86A	93A	41D	75A	75A	86A	89A	98A
Tensile stress at 100% (MPa)	ASTM D412	2,60	2,9	3,60	3,400	4,7	7,1	9,00	2,70	2,3	3,90	4,5	7,2
Tensile stress at break at 23°C (MPa)	ASTM D412	7,00	7,6	8,80	7,900	11,1	15,0	9,00	6,30	4,8	9,0	10,6	13,9
Elongation at break at 23°C (%)	ASTM D412	450	570	490	480,000	540	580	610	550	480	550	540	630
Elongation at break at 23°C (%)	ASTM D412	450	570	490	480,000	540	580	610	550	480	550	540	630

Physical and mechanical properties after aging 150°C for 168 hrs

Change in hardness	ISO 868	2	2	7	1,7	5	2	4	-	-	-	-	-
Change in tensile strength (%)	ASTM D412	-12	-9	-1	-8	-5	-15	-11	-	-	-	-	-
Change in elongation at break (%)	ASTM D412	-6	-8	-3	-9	-12	-16	-15	-	-	-	-	-
Low temperature brittleness (°C)	ASTM D746	-60	-63	-60	-60	-60	-54	-52	-	-	-	-	-
Elongation at break at 23°C (%)	ASTM D412	450	570	490	480,000	540	580	610	550	480	550	540	630
Elongation at break at 23°C (%)	ASTM D412	450	570	490	480,000	540	580	610	550	480	550	540	630

Continuous Upper Temperature Resistance, 1008hrs (°C)	SAE J2236	135	-	135	135	135	135	-	-	-	-	-	-
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Fire resistance properties

UL 94 Flammability	UL 94	HB (1,0mm)	HB (1,0mm)	HB (1,0mm)	HB (1,0mm)	HB (1,0mm)	HB (1,0mm)	HB (1,0mm)	V0 (1.5mm)	5VA (1.8mm)	V0 (1.5mm)	V2 (0.75mm)	V0 (1.5mm)
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Electrical properties (UL Certified)

Volume resistivity 500V for 60 seconds (ohm-cm)	ASTM D257	7.67X1015	-	6.83X1015	1.0E+15	1.0E+15	1.0E+15	1.0E+15	-	-	-	-	-
Volume resistivity after water immersion 80°C/3 days (ohm-cm)	ASTM D257	3.58X1015	-	2.39X1015	-	-	-	-	-	-	-	-	-
Dielectric strength (kV/mm)	ASTM D149	41	-	43	43	43	45	53	31	28	28	-	31
Dielectrical constant, 60Hz, 1,98mm	ASTMD150 / IEC 60250	2,3	-	2,4	2,5	2,5	2,4	2,3	2,5	2,3	2,3	-	-
Dielectrical Loss, 37GHz	ASTM D2520	-	-	-	-	-	-	-	0,0014	0,0027	-	-	-

Thermal UL Yellow Card (UL Certified)

UL QMFZ2** TPE UL RTI Elec Str @ 1.5 mm (°C)	UL 746B	100	100	100	90	100	100	85	90	90	90	50 (0,75mm)	90
UL QMTT2* TPE 720 hr sunlight resistance, jacket compounds (°C)											105	105	90
UL QMTT2* TPE wet-location (°C @ 0.77 mm)						60	60						
Outdoor UL classification	UL 746C	f2			f1					f1	f1***		

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