

Description

DuPont™ Vamac® G is a terpolymer of ethylene, methylacrylate, and a cure site monomer. It is cured using an amine-based vulcanization system. This gum elastomer includes a small amount of processing aid, and has a nominal specific gravity of 1.03. It has a mild acrylic odor. Use adequate ventilation during storage, mixing, and processing to prevent accumulation of residual vapors. Storage stability is excellent.

Product Properties

Property	Target Value	Method
Mooney Viscosity ML 1'+4' at 100 °C (212 °F)	16.5	ASTM D1646
Volatiles, wt %	≤ 0.4	Internal DuPont Test
Form, mm (in)	Bale size is nominally: 560 x 370 x 165 (22 x 15 x 7)	Visual inspection
Color	Clear	Visual inspection

Major Performance Properties and Applications

Vamac® G has excellent high-temperature durability and oil resistance with service lubricants, coupled with good low-temperature flexibility. Compounds of Vamac® G are typically rated at 175 °C (347 °F) for heat resistance, with oil swell values around 50% in IRM 903 oil. The properties of Vamac® G make it well suited for a wide range of automotive applications, including powertrain seals and gaskets, rocker cover and piston seals, oil coolant hoses, power steering hoses, turbocharger hoses, crankcase ventilating tubes, coverings for fuel and coolant hoses, O-rings, grommets and spark plug boots.

Vamac® G is an excellent vibration damping material that is uniquely insensitive to temperature over a range of –30 °C (–22 °F) to 160 °C (320 °F). Compounds of Vamac® G are suitable for use in torsional dampers and isolator pads.

Vamac® G is a halogen-free polymer and does not decompose to give off corrosive gasses when exposed to flame. It is used for flame-retarded, low-smoke, nonhalogen wire and cable jackets and in nonhalogen, low-smoke flooring.

Vamac® G is well suited for injection, transfer and compression molding, and is easily extruded.

Handling Precautions

Because Vamac® G contains small amounts of residual methylacrylate monomer, adequate ventilation should be provided during mixing and processing to prevent worker exposure to methylacrylate vapor. Additional information may be obtained in the Material Safety Data Sheet (MSDS), and the “Safe Handling and Processing of Vamac® and Vamac® Compounds Guide” available from vamac.dupont.com.



Compound and Vulcanizate Properties

Compounds of DuPont™ Vamac® are formulated and processed by customers to meet their own specific performance requirements. Many of the highest-performing compounds are vulcanizates of Vamac® are proprietary, and cannot be published by DuPont.

DuPont has independently formulated a wide variety of Vamac® compounds for its own short- and long-term properties testing programs. A typical compound of Vamac® G is reviewed below, followed by vulcanizate performance test data that can help endusers evaluate the potential fitness of similar compounds for their own applications.

Table 1 – Sample Compound, Vamac® G

Ingredients	Parts
Vamac® G	100
Antioxidant: Naugard® 445	1
Release agent: Stearic acid	1.5
Release agent: Vanfre® VAM (alkylphosphate)	1
Release agent: Armeen® 18 (octadecylamine)	0.5
SRF black (N774)	65
Curative: Diak™ No. 1 (hexamethylene diamine carbamate)	1.5
Coaccelerator: DOTG (guanidine coagent)	4
Total Parts	174.5
Stock Properties	
Mooney Viscosity: M-L (1+4) at 100 °C (212 °F), Mooney units	40
Mooney Scorch: MS at 121 °C (250 °F)	
Minimum Viscosity, units	16
Time to 10-unit rise, min.	13

Table 2 – Physical Properties of Vulcanizate

Slab Cure: 10 min. at 177 °C (350 °F) – Post Cure: 4 hrs at 175 °C (347 °F)

Stress/Strain and Hardness

Original Values

100% Modulus, MPa (psi)	5.1 (735)
Tensile Strength, MPa (psi)	16.55 (2400)
Elongation at Break, %	280
Hardness, "A" Durometer	68

Aged 1008 Hrs at 150 °C (302 °F) in Air

100% Modulus, MPa (psi)	6.4 (925)
Tensile Strength, MPa (psi)	15.3 (2215)
Elongation at Break, %	225
Hardness, "A" Durometer	77

Aged 70 Hrs at 150 °C (302 °F) Immersed in ASTM #1 Oil

100% Modulus, MPa (psi)	4.7 (680)
Tensile Strength, MPa (psi)	14.1 (2040)
Elongation at Break, %	295
Hardness, "A" Durometer	66
Volume Increase, %	9

Aged 70 Hrs at 150 °C (302 °F) Immersed in IRM 903

100% Modulus, MPa (psi)	4.8 (695)
Tensile Strength, MPa (psi)	8.8 (1275)
Elongation at Break, %	185
Hardness, "A" Durometer	48
Volume Increase, %	60

Aged 1008 Hrs at 150 °C (302 °F) Immersed in SF-105 Oil

100% Modulus, MPa (psi)	4.7 (680)
Tensile Strength, MPa (psi)	11.3 (1640)
Elongation at Break, %	150
Hardness, "A" Durometer	58
Volume Increase, %	32

Table 2 – Physical Properties of Vulcanizate**Slab Cure: 10 min. at 177 °C (350 °F) – Post Cure: 4 hrs at 175 °C (347 °F) (continued)****Stress/Strain and Hardness****Aged 1008 Hrs at 150 °C (302 °F) Immersed in GM
Dexron® III ATF**

100% Modulus, MPa (psi)	5.2 (750)
Tensile Strength, MPa (psi)	13.79 (2000)
Elongation at Break, %	220
Hardness, "A" Durometer	57
Volume Increase, %	28

Compression Set, Method B, Plided, %

	Hours Tested				
	70	168	336	504	1008
At 150 °C (302 °F)	16	21	26	30	40
At 177 °C (350 °F)	—	24	—	—	—

Low-Temperature Properties

DSC

Initial, °C (°F) –32.64 (–26.75)

Inflection, °C (°F) –27.92 (–18.26)

Note: The data shown here for this sample compound of Vamac® G fall within the normal range of compound properties, but they should not be used to establish specification limits, nor used alone as the basis for predicting performance under end-use conditions. Additional test data for this and other compounds of Vamac® are available from DuPont on request.

The test methods used in the work are shown below:

Rheology	
Mooney Viscosity	D 1646
Mooney Scorch	D 1646
MDR	D 5289
Physicals	
Hardness	D 2240
Tensile, Elongation, Mod	D 412
Tear, Die C	D 624
Fluid Aging	D 471
Compression Set	D 395
Tg by DSC	D 3418
Aging in Air	D 573
Temperature of Retraction	D 1329

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The information set forth herein is furnished free of charge and is based on technical data that DuPont believes to be reliable and falls within the normal range of properties. It is intended for use by persons having technical skill, at their own discretion and risk. This data should not be used to establish specification limits nor used alone as the basis of design. Handling precaution information is given with the understanding that those using it will satisfy themselves that their particular conditions of use present no health or safety hazards. Since conditions of product use and disposal are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information. As with any product, evaluation under end-use conditions prior to specification is essential. Nothing herein is to be taken as a license to operate or a recommendation to infringe on patents.

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