

Description

DuPont™ Vamac® GLS is a terpolymer of ethylene, methyl acrylate, and a cure site monomer cured using a diamine-based vulcanization system. Compared with Vamac® G, Vamac® GLS offers significantly improved resistance to oil swell and chemicals such as diesel fuel. Vamac® GLS elastomer contains a small amount of processing aid and has a nominal specific gravity of 1.06. It has a mild acrylic odor. Storage stability is excellent.

Product Properties

| Property | Target Value | Method |
|--|--|----------------------|
| Mooney Viscosity ML 1'+4' at 100 °C (212 °F) | 18.5 | 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 |

Handling Precautions

Because Vamac® GLS contains small amounts of residual methyl acrylate monomer, adequate ventilation should be provided during storage, mixing and processing to prevent worker exposure to methyl acrylate 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.

Compounds and Vulcanizate Properties

Compounds of Vamac® are formulated and processed by customers to meet their own specific performance requirements. Many of the highest-performing compounds and vulcanizates of Vamac® GLS 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® GLS is reviewed in *Table 1*, followed by vulcanizate performance test data (*Table 2*) that can help end-users evaluate the potential fitness of similar compounds for their own applications.



Table 1 – Sample Compound, DuPont™ Vamac® GLS

| Ingredients | Parts |
|---|--------------|
| Vamac® GLS | 100 |
| Antioxidant: Naugard® 445 | 2 |
| Release agent: Stearic acid | 1.5 |
| Release agent: Vanfre® VAM (alkylphosphate) | 1 |
| Release agent: Armeen® 18 (octadecylamine) | 0.5 |
| FEF black (N550) | 60 |
| Curative: Diak™ No. 1 (hexamethylene diamine carbamate) | 1.5 |
| Coaccelerator: DOTG (guanidine coagent) | 4 |
| Plasticizer: TP-759 | 10 |
| Total Parts | 180.5 |
| Stock Properties | |
| Mooney Scorch: MS at 121 °C (250 °F) | |
| Minimum Viscosity, units | 14.9 |
| Time to 10-unit rise, min. | 10.1 |

Table 2 – Physical Properties of Vulcanizate

| | | | |
|--|--------------------------------------|---|--|
| Press Cure, Slabs: 5 min. at 177 °C (350 °F) | | | |
| Postcure: 4 hrs at 175 °C (347 °F) | | | |
| Glass Transition Temperature, DSC, °C (°F) | | -30 (-22) | |
| Tear Strength at 23 °C (73 °F), Die C, dN/m(lb/in) | | 34.0 (190) | |
| Compression Set, Method B | | | |
| 70 hrs. at 150 °C (302 °F), % | | 20 | |
| 168 hrs. at 150 °C (302 °F), % | | 28 | |
| Volume Swell, Immersed 70 hrs at 150 °C (302 °F) in IRM 903 Oil, % | | 26.7 | |
| | Original Value (Not Aged) | Air Aged 7 Days at 150 °C (302 °F) | Air Aged 14 Days at 175 °C (347 °F) |
| Stress/Strain and Hardness | | | |
| 100% Modulus, N-m (psi) | 6.4 (930) | 6.8 (980) | 9.5 (1370) |
| Property change after aging, % | — | +5 | +47 |
| Tensile Strength, N-m (psi) | 16.1 (2340) | 15.6 (2270) | 15.4 (2230) |
| Property change after aging, % | — | -3 | -5 |
| Elongation at Break (%) | 272 | 278 | 193 |
| Property change after aging, % | — | +2 | -29 |
| Hardness, A Durometer | 68 | 72 | 86 |
| Property change after aging, points | — | +4 | +18 |

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 |

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