

POLYESTER PREFORM - HAND POUR, COMPRESSION MOLD, 44% GLASS FIBER REINFORCED

GMP.UP.011

1 SCOPE. This specification covers the properties of a compression molded, hand poured polyester using a directed fiberglass preform. The cured material shall contain 44% random oriented chopped glass fibers about 25 mm long.

1.1 BONDABILITY. The material must meet the bondability requirements of GM3629M using both urethane adhesive that has been approved to 9985786 and an epoxy that has been approved to 9985600.

1.2 APPLICATIONS. Typical applications include the following: Structural body panels.

2 REFERENCED STANDARDS.

GM1000M	9985786	ASTM D792
GM3629M	ASTM D570	ASTM D2584
GM9077P	ASTM D638	ASTM D4812
9985600	ASTM D790	

3 TEST PROCEDURES. Tests shall be conducted using the latest issue of the test methods indicated. Suitable precautions should be taken to ensure that applicable safe limits are not exceeded when conducting test procedures, processes, and/or handling the materials required by this specification.

3.1 Properties shall be determined using test specimens router cut from Resin Transfer Molded test plaques. Plaques shall be molded using the mold temperatures, mold pressure and cure cycle that will be used to mold production parts. Each material vendor shall define these molding conditions in his certifiable data package. The length and width of the test mold, as well as the gate configuration, shall be included in the certification package. Plaques shall be 2.5 ± 0.1 mm thick. Weight variation between plaques shall not exceed $\pm 3.0\%$.

3.2 Raw materials used for molding shall be within their vendor defined shelf life. Plaques shall be uniform in appearance and free from blisters, pregels, knit lines, cracks, and surface contamination. Porosity shall be 1 pit max per 625 mm². Surfaces shall also be free of external mold release.

3.3 An equal number of specimens shall be cut from both the longitudinal and transverse plaque directions for each mechanical property. The specimens shall be tested and the results averaged. The average value is the material property value. This value is compared to the required value shown in the Compound Properties table(s).

3.4 Tests shall be conducted 40 h min after molding and immediately following a conditioning period of 24 h min at 22 ± 3 °C and $50 \pm 5\%$ RH unless otherwise specified. All testing shall be done on unannealed samples.

4 COMPOUND PROPERTIES.

4.1 RESTRICTED AND REPORTABLE CHEMICALS GM1000M. All materials supplied to this specification must comply with the requirements listed in GM1000M, "Restricted and Reportable Chemicals".

4.2 COMPOUND CERTIFICATION. Material suppliers must certify molding compound properties to the specific GM Test Sampling Plan approved for their material.

4.3 COMPOUND PROPERTIES (NATURAL, GRAY AND BLACK). See Table 1.

4.4 CONSTITUENT MATERIALS. Individual specifications for the materials which constitute the molding compound shall be established by the molder. Incoming materials shall be approved to those specifications by the molders laboratory before release for production. Test results shall be maintained by the molder and be available for General Motors review.

5 SUGGESTED COMPOUND VERIFICATION.

Inherent compound properties and test procedures that may be used to identify this material are listed below. The test value and test procedure requirements are identical to those listed in Section 3 and 4, Test Procedures and Compound Properties.

Filler Content
Glass Fiber Content
Infrared Characterization Scan
Specific Gravity

6 COMPOUND AND SOURCE APPROVAL.

Each vehicle group and component division will have its own approved compound list derived from the corporate plastics file. No shipment shall be made by a new source until a sample of the compound manufactured at a production facility has been approved by the appropriate vehicle group and/or component division. Shipment receipt and certification requirements will vary among receiving locations.

6.1 Completed copies of the Material Safety Data Sheet meeting GM information requirements must be submitted with any new submissions or whenever a composition change has occurred.

7 IDENTIFICATION. The molding compound shall be identified by the specification code, the manufacturer's identification code and lot number, along with any additional vehicle group and component division requirements.

8 INSPECTION AND REJECTION. The purchaser reserves the right to sample incoming shipments even though it is the responsibility of the supplier to meet the requirements stated without dependence upon the purchaser's inspection. The supplier (whether prime contractor or subcontractor) will forfeit qualification if a change is made in material, processing methods, testing methods, or location of manufacture without prior written request to and subsequent approval from the purchaser.

9 GENERAL INFORMATION. This standard was originated by the Plastics Committee in August 1994 and published in August 1995.

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TABLE 1 - COMPOUND PROPERTIES**

Properties	Test Values	Test Methods
Glass Fiber Reinforcement	40 - 48%	TGA, GM9077P or ASTM D2584
Moisture Absorption	0.95% max	ASTM D570
Specific Gravity	1.50 max	ASTM D792
Flexural Modulus @ +22°C 2.5 mm deflection	9200 MPa min	ASTM D790, Method I, 1.3 mm/minute, 50 mm span, 25 mm wide specimen, secant calculations at 2.5 mm deflection
@ 70°C 2.5 mm deflection	6900 MPa min	
Flexural Strength	207 MPa min	ASTM D790, Method I, 1.3 mm/minute 50 mm span, 25 mm wide specimen,
Tensile Strength at Break	85 MPa min	ASTM D638, Type I bar, 5 mm/minute
Tensile Modulus	10100 MPa min	ASTM D638, Type I bar, 5 mm/minute
Unnotched Izod Impact	500 J/m min	ASTM D4812