



Rigid PUR Foam Reinforced with Glass Fibers for Cover Seat Back

1 Scope

1.1 Material Description. Rigid polyurethane (PUR) foam based on polyether reinforced with long glass fibers. The foam is molded into a part where the appearance side is laminated according to drawing specification.

1.2 Symbols. Not applicable.

1.3 Typical Applications. Foam for molding of foil or upholstery laminated parts, e.g., cover back front seat.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

CMVSS 302	FMVSS 302	ISO 105-A02	ISO 3451
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2.2 GM Standards/Specifications.

GMW3059	GMW3232	GMW6992	GMW14363
GMW3182	GMW3235	GMW14093	GMW15634
GMW3205	GMW3259	GMW14131	GMW15635
GMW3221	GMW4659	GMW14357	GMW16853

2.3 Additional References.

TMC003 Material Safety Data Sheet guidance documents (available at www.gmsupplypower.com).

3 Requirements

3.1 General. For the finished part, only foam flocks of nearly equal hardness may be applied. The origin of the foam wastes shall be noted on the Foam Certification Data Form (see Appendix A).

3.2 Test Piece and Number. If it is not possible to take test pieces from the molded part, then suitable plates shall be manufactured for the test (taken from equal manufacturing process, recipe of foam and density). The test piece shall be taken without skin and in rising direction of foam.

3.3 Conditioning. Immediately prior to test, all test pieces shall be pre-dried at $+70\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ and conditioned. The pre-drying period shall be $\geq 16\text{ h}$ for tests conducted after humidity aging to GMW14357 and shall be $\geq 3\text{ h}$ for other tests. Following pre-drying, all test pieces shall be conditioned to GMW3221, Code A.

3.4 Required Performance Values. All requirements listed in Table 1 shall be fulfilled by the delivered foam and shall be documented by the supplier in the Foam Certification Data Form (see Appendix A).

3.5 Basic Foam Physical Properties. All requirements listed in Table 2 shall be fulfilled by the delivered foam and shall be documented by the supplier in the Foam Certification Data Form (see Appendix A). Values indicated with "TBD" ("to be determined") shall be documented and may be noted on the drawing/in the math data for production quality check purposes. Values indicated with "N/A" ("not applicable") are not required. Documentation of additional properties may be required by the approving region. Test Report according to GMW16853 has to be added.

3.6 Molded Part (Assembly) Properties. All requirements listed in Table 3 shall be fulfilled by the molded part (final laminated assembly) and shall be documented by the supplier in the Foam Certification Data Form (see Appendix A). Values indicated with "TBD" shall be documented and may be noted on the drawing/in the math data for production quality check purposes. Values indicated with "N/A" are not required. Documentation of additional properties may be required by the approving region. Test Report according to GMW16853 (Table 4) has to be submitted at the time of approval.

3.7 Lamination. The material used for lamination shall meet the relevant GM material specification (see drawing/math data specifications).

Table 1: Required Performance Values for Documentation

Performance	Test Method	Specified Value
Flammability	GMW3232	Must comply to CMVSS 302 and FMVSS 302.
Emission Testing of Interior Materials (Odor, Fogging, Emissions)	GMW16853	See Table 4
Steam Autoclav	PUR-Foam-Polyether: 5 h, +120 °C ±3 °C GMW14357-E	No visible degradation, no adverse changes of shape, surface as the physical and chemical properties.
Mildew ^{Note 1}	GMW3259	No mildew
Compatibility ^{Note 2}	GMW4659	-
	Color Stability of the Cover Layer - Color Change - Shade Change (if cover layer is leather or plastic roll good only)	Visual evaluation to GMW6992: No color change, slight darken permissible. Grayscale to ISO 105-A02 Rating ≥3
	Other changes	No adverse changes of shape, surface as the physical and chemical properties.

Note 1: Required only if natural fibers are present in the construction.

Note 2: Foam shall meet compatibility in the production intended composite. The test pieces shall be sewn or welded (dependent on use), using production techniques, to all possible combinations of composite materials taken at the same time from production to form a test pack. **Note:** For any changes in the quality of any of the composite materials, compatibility tests shall be repeated. At the discretion of the approving GM Engineer, foam material may be tested to standard composite materials for initial foam approval, e.g., a standard vinyl. Nevertheless, final foam approval shall be achieved in the production intended composite.

Table 2: Basic Foam Physical Properties

Property	Test Method	Unit	Specified Value
Ash (Long Glass Fiber Content)	ISO 3451 +950 °C	% by mass	≥20
Mass per Unit Area	GMW3182	g/m ²	≥800
Impact Resistance	GMW14093 -C-3 510 g ± 1 g Steel Ball, -30 °C ± 3 °C	J	≥2.5

Table 3: Molded Part (Assembly) Properties

Property	Test Method	Unit	Specified Value
Temperature Resistance	Storage of molded part for: 1 h $\pm$ 0.5 h at +100 °C $\pm$ 3 °C 24 h $\pm$ 1 h at +80 °C $\pm$ 3 °C 24 h $\pm$ 1 h at -30 °C $\pm$ 3 °C	-	No visible degradation, no adverse changes of shape, surface as the physical and chemical properties.
Indentation Hardness	GMW14363		
	Deformation at Center of Surface ^{Note 1}	mm	TBD
	Deformation at Bolster ^{Note 2}	mm	TBD

Note 1: Deformation point for "Center of Surface" value (see Point 1 of Figure 1) shall be identified on the molded part drawing.

Note 2: Deformation point for "Bolster" value (see Point 2 of Figure 1) shall be identified on the molded part drawing.

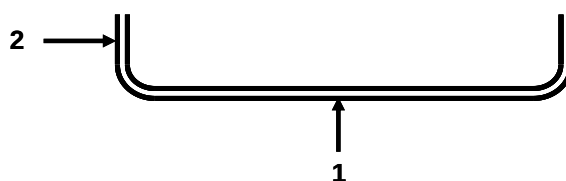


Figure 1: Indentation Hardness Test Points

Table 4: Test Report According to GMW16853

Note: Enter only test values that are applicable for the material/part. If a test or a test option is not applicable, mark the result cell with "N/A".

General Information	
Model Year/Vehicle/Project Number	
Assembly/Part Name:	
Assembly/Part number:	
Assembly/Part dimension:	
Weight (for cut goods weight of 1 m ²):	
Material/Composite	
Raw Material Supplier(s) and trade Name(s) of all used materials:	
Vendor Name (with Address) also Manufacturer Name and Address (if different)	