



Part Performance Requirements of Sheet Molding Composite (SMC)

1 Scope

1.1 Material Description. This specification covers the part performance requirements of parts made from low profile thermoset, unsaturated polyester composite material.

1.2 Symbols. Not applicable.

1.3 Applicability. Typical applications include exterior and interior, structural and non-structural panels and assemblies.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GM9233P	GMW14444	GMW15777	GMW16853
GMW3059	GMW14829		

2.3 Additional References.

GM Test Sampling Plan

3 Requirements

3.1 Compound Certification. Material suppliers must certify molding compound properties to the specific GM Test Sampling Plan approved for their material.

3.2 Emissions Testing of Interior Materials and Parts. For all Code E designated parts per GMW14444, reference GMW16853 for emissions testing of interior materials and parts.

3.3 Dimensional Stability. Parts must meet dimensions and tolerances shown on the part drawing both before and after exposure to 120 °C for 2 h. In addition parts must not exhibit any cracking, crazing, porosity, or change in smoothness following the above heat exposure. The parts must not exhibit any billowing or shrinkage over ribs or beam sections after exposure to preceding temperatures.

3.4 Surface Defects. Parts shall be free from surface defects to the extent that there shall be no paint popping or blistering during or after the primer and/or color topcoat paint bake cycles.

Note: It is recommended that all shears within 10.0 mm of a painted (Zone A, B, or C per GMW15777) surface be sanded to a 0.5 mm to 1.5 mm radius. The radius area shall be finish sanded with 400 grit.

3.4.1 There must not be any glass fiber, loose glass fiber, or loose agglomerate of fillers, or other constituent of the Sheet Molding Composite (SMC) matrix having any dimension greater than 0.03 mm around any pierced or machined holes in the part. Loose material is defined as that which will adhere to pressure sensitive tape, when applied and pulled per GMW14829.

3.5 Appearance. In mold coating or primed surfaces of parts must be free of scratches or mars.

Note: Scratches and mars may be caused by the contacting surfaces of handling devices, storage rack, fixtures or other tools which are harder than the surface of the part. In order to prevent surface damage, all contacting surfaces should be soft urethane with a durometer hardness of $< 90 \pm 5$ Shore A.

3.6 Repair Systems. The molding source must receive engineering approval on all repair systems and materials used. Repairs must meet the requirements in Repair Systems for SMC per GM9233P.

4 Manufacturing Process

4.1 E-Coat, Electrodeposition, Electrocoat (ELPO) Primer Bake. Laminate blistering might occur during the ELPO primer or subsequent bake cycles if the rate of part surface temperature rise exceeds 15 °C/minute. This propensity to blister will be exacerbated by a high moisture content in the part. This is a minimum heat up rate to be used by the part supplier to validate the SMC material, and the maximum heat up rate to be used when processing parts through ELPO or other paint curing ovens at GM.

4.1.1 If a part will be processed through an ELPO oven, the parts must meet the dimensions and tolerance indicated on the part drawing both before and after exposure to the paint baking conditions. In addition, the parts must not blister or exhibit any other deleterious effect following the exposure.

5 Rules and Regulations

5.1 Legal Regulations. All materials must satisfy applicable laws, rules, regulations and recommendations valid in the country of usage.

5.2 Language. In the event of conflict between the English and domestic language, the English language shall take precedence.

5.3 Inspection and Rejection. Samples of components or materials released to a GM material specification shall be tested for conformity with the requirements of this material specification and approved by the responsible Engineering department prior to commencement of delivery of bulk supplies.

A new approval must be received for any changes, e.g., properties, manufacturing process, location of manufacture, etc. If not otherwise agreed, all testing and documentation normally required for initial release must be completed.

It is the responsibility of the supplier to inform the customer in a timely manner, without solicitation, and to include documentation of all modifications of materials and/or processes and to apply for a new release.

5.4 Material Safety Data Sheets/Safety Data Sheets (MSDS/SDS). For new product submissions, or when a change in chemical composition of an existing product has occurred, a complete copy of the Material Safety Data Sheet/Safety Data Sheet must be submitted in compliance with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) requirements or other country-specific MSDS/SDS requirements.

5.5 All materials supplied to this standard must comply with the requirements of the International Material Data System (IMDS) and GMW3059, **Restricted and Reportable Substances**.

6 Approved Sources

Materials supplied to this specification must be approved by General Motors.

A list of approved materials can be found in MATSPC. This GM Material File is provided to third parties to reduce redundant testing of materials. If approved material already listed is used, the part supplier can use GM Material File reference for Production Part Approval Process (PPAP) material approval. If the decision is made to use a not yet approved material, contact GM Materials Engineering for details on the approval process. The material approval process must be completed prior to PPAP start date of the part supplied to General Motors.

7 Notes

7.1 Glossary.

MATSPC: Global repository of GM approved materials for corresponding GM Engineering Standards.

7.2 Acronyms, Abbreviations, and Symbols.

ELPO	E-Coat, Electrodeposition, Electrocoat
GHS	Globally Harmonized System of Classification and Labeling of Chemicals
GSSLT	Global Subsystem Leadership Team
IMDS	International Material Data System