



Glass Fiber Reinforced Polyester/Polyethylene Terephthalate (PET) Composite Laminate

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This specification covers the sandwich construction process and the physical and mechanical properties of the resulting laminate. The skin consists of a glass reinforced unsaturated polyester composite per GMW17277. The core consists of Polyester/Polyethylene Terephthalate (PET) foam per GMW17276.

1.2 Applicability. Floor panels.

2 References

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

2.1 External Standards/Specifications.

ASTM C273

ASTM C297

ISO 178

SAE J400

2.2 GM Standards/Specifications.

GMW3059

GMW17276

GMW17277

3 Test Preparation and Evaluation

3.1 Resources.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.1.3 Facilities. Not applicable.

3.1.4 Equipment. Not applicable.

3.1.5 Test Vehicle/Test Piece. Not applicable.

3.1.6 Test Time. Not applicable.

3.1.7 Test Required Information. Not applicable.

3.1.8 Personnel/Skills. Not applicable.

3.2 Preparation. Not applicable.

3.3 Conditions.

3.3.1 Environmental Conditions. Not applicable.

3.3.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

Tests shall be conducted 40 h after molding and immediately following a conditioning period of 24 h minimum @ 22 °C ± 3 °C and 50% ± 5% relative humidity (RH) unless otherwise specified. All testing shall be done on unannealed samples.

3.4 Instructions. Not applicable.

3.5 Data. Not applicable.

3.6 Safety. This standard may involve hazardous materials, operations, and equipment. This standard does not propose to address all the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

3.7 Documentation. Samples of components or material released to this standard shall be tested for conformity with the requirements of this standard and approved by the responsible GM Department prior to the start of delivery of production level components or materials.

Any change to the component or material, e.g., design, function, properties, manufacturing process and/or location of manufacture requires a new release of the product. It is the sole responsibility of the supplier to provide the customer, unsolicited, with documentation of any change or modification to the product/process, and to apply for a new release.

If not otherwise agreed to, the entire verification test shall be repeated and documented by the supplier prior to start of delivery of the modified or changed product. In some cases, a shorter test can be agreed to between the responsible GM department and the supplier.

3.7.1 Test Results. Not applicable.

4 Requirements and Procedure

4.1 Construction Requirements.

4.1.1 Cut and form the PET foam core per GMW17276.

4.1.2 Apply two layers of 600 g/m² (2.0 oz/yd²) continuous strand glass mat to both sides of the PET foam core forming a sandwich construction.

4.1.3 Cover the bottom of the mold with a weighed amount of compounded polyester resin per GMW17277. Then lay in the sandwich construction from paragraph 4.1.2. Pour a second measured amount of the polyester compounded resin on the sandwich, then close the mold and cure the laminate.

4.1.4 The molding conditions will be determined by Design of Experiments (DOE) and then posted on the press as a Standard Operating Procedure (SOP) for the operator. The procedure and critical molding conditions will be controlled by Statistical Process Control (SPC) techniques.

4.1.5 The overall thickness of the composite laminate shall be in the range of 14.5 mm to 15.5 mm.

4.2 General Compound Properties. See Table 1.

Table 1: General Compound Properties

Property	Test Methods	Test Values
Tensile Strength	ASTM C297 (flatwise)	1.74 MPa to 2.68 MPa
Shear Strength in Flatness Plane	ASTM C273	1.07 MPa to 2.21 MPa
Flexural Modulus	ISO 178, Secant at 2.5 mm, 3 Point Loading	6500 MPa to 9100 MPa
Flexural Strength	ISO 178, Method 1	99 MPa to 165 MPa
Gravelometer	SAE J400, 50 Cycles @ 22 °C	No penetration to the core

5 Provisions for Shipping

Not applicable.

6 Notes

6.1 Glossary. Not applicable.