



Transport Protective Cover Material

1 Scope

1.1 Material Description. This standard specifies the requirements for the non-woven fabric for exterior paint protection.

1.2 Symbols.

1.3 Typical Applications. The material specified by this standard is designed for protecting the coating of the finish vehicle body for typically a six month period during the transport of the vehicle from the assembly plant to the dealer.

2 References

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

2.1 External Standards/Specifications.

FMVSS 302	ISO 5084	ISO/IEC 17025	SAE J2527
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2.2 GM Standards/Specifications.

GMW3010	GMW3221	GMW3402	GMW14124
GMW3059	GMW3232	GMW3405	GMW14334
GMW3182	GMW3326	GMW14108	

2.3 Additional References.

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

3 Requirements

3.1 Requirements on Test Specimens. Reference GMW3221.

3.1.1 Test Data. Lab testing shall be performed by a laboratory that conforms (meets requirements but may not be formally recognized by a third party) to ISO/IEC 17025 and is acceptable to the responsible GM Department. Test reports must conform to ISO/IEC 17025. Supplier shall submit a letter of compliance.

3.1.2 Material Construction Specification. All required information shall be reported on the Construction Certification Data Form in Appendix A. A form shall be submitted along with each carpet material submitted for Engineering Approval. Established values for a construction will be reported on and controlled within the limits established on the Construction Certification Data Form. See Appendix A.

3.1.3 Standard Conditions (GMW3221-A). All test specimens shall be conditioned to GMW3221, Code A, for a minimum of 24 h, unless the test method indicates that standard conditioning is not required or that other conditions apply.

3.1.4 Sampling. When multiple test specimens are required, they shall be taken diagonally across the sample so that no two test specimens overlap in the same row of yarns. Avoid taking specimens from damaged, contaminated, or defective areas caused by improper handling or manufacturing.

3.1.5 Data Reporting. If all individual readings of a specific test meet or exceed the specified requirements, report the average. Unless otherwise stated, any individual reading outside the specified limit does not meet the requirement. Report all individual test results that do not meet the requirements. All required information shall be reported on the appropriate Construction Certification Data Form (Appendix A).

3.1.6 Deviations from Defined Test Methods. Deviations from the conditions of any test method shall have been agreed upon between supplier and vehicle manufacturer. All deviations shall be specified on the component drawings, material specifications, etc. and shall be indicated on test certificates, reports, etc.

3.1.7 Documentation. Samples of components or materials released to this specification shall be tested for conformity with the requirements of this specification 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 of 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.

3.2 Construction Requirements.

3.2.1 Weight (GMW3182). Test three specimens. Report the results in gram/square meters. Refer to the Construction Certification Data Form in Appendix A for weight specification requirements.

3.2.2 Thickness (ISO 5084). Refer to the Construction Certification Form. Report the average for three specimens in millimeters to the nearest 0.01 mm. Use a 4.0 N load and a 200 mm $\pm$ 0.8 mm diameter presser foot to achieve a pressure of 0.127 kPa. All readings should be taken after the presser foot has been in contact with the material for at least 5 s. The specimen size shall be 100 mm x 100 mm.

3.2.3 Tensile Strength and Elongation (GMW3010, Code S). Test three specimens each machine direction (MD) and cross machine direction (CMD). Report the average tensile strength at break and elongation at 50 N in each direction. The minimum requirements shall be 200 N for MD and 150 N for CMD. The elongation shall be minimum 5% in each direction.

3.2.4 Tear Strength-Trapezoid Tear (GMW3326). Test three specimens for MD and three specimens for CMD. The minimum average value shall be 100 N.

3.2.5 Seam Fatigue (GMW3405).

3.2.5.1 For Sewed Seams. The joining seam of the fabric shall have no slippage (increased distance between rows of yarns), noticeable fiber or yarn breakage, fractures of the sew line, needle hole elongation higher than 2 mm, nor an objectionable seam appearance after 1000 cycles.

3.2.5.2 For Welded Seams. The tensile strength shall be tested.

3.2.6 Dimensional Stability (GMW14124, Two Cycles M). The specimens shall exhibit a satisfactory rating and show no cracking, crazing, no color change, no cloudiness, blistering, and no loss of the adhesion to the substrate between the layers of the composite or other changes detrimental to serviceability. Dimensional changes shall be less than 5%.

3.2.7 Humidity Resistance. The specimens shall be exposed for 168 h in a humidity cabinet operating at 40 °C $\pm$ 3 °C, and 93% $\pm$ 5% relative humidity (RH). The test specimens shall show no significant surface change, particularly changes in color or gloss, or other changes detrimental to serviceability.

3.2.8 Resistance to the Heat Aging. The specimens shall be exposed for 168 h in a convectional oven at 85 °C. The test specimens shall show no significant surface change, particularly changes in color or gloss, or other changes detrimental to serviceability.

3.2.9 Cold Resistance (GMW14108, 4 h at -30 °C). The specimens shall show no cold crack or other changes of the surface or other changes detrimental to serviceability.

3.2.10 Chemical Resistance (GMW14334, Code B). Test specimens shall show no significant surface changes, particularly changes in gloss or color, no embrittlement, no objectionable shrinkage or other changes detrimental to serviceability.

3.2.11 Soil and Cleaner Resistance (GMW3402, GMW3221 Ultraviolet (UV) Part A and B, Soil Agents: A, B, H, I). Test specimens shall show no significant surface changes, particularly changes in gloss or color, no embrittlement, no objectionable shrinkage or other changes detrimental to serviceability.

3.2.12 Compatibility. The material specimens must be tested to the paint system compatibility, by exposing the paint panel and the cover material, as a composite using 2 kg weight applied over for 96 h at 70 °C. No paint surface damage, loss of gloss, or any sign of cover material transfer to the paint panel shall be noticed.

3.2.13 Accelerated Weathering (SAE J2527, Extended UV Filters, 632 kJ/m²). The test specimens shall show no sign of significant color or gloss change. Minimum 4 of AATCC gray scale rating.

3.2.14 Flammability (GMW3232). The maximum burn rate shall be less than 100 mm/minute and must comply with FMVSS 302. The test report must be completed.