



Protective Fabric Covers for Vehicles

1 Scope

1.1 Material Description. This specification details the properties of fabric materials used in vehicle covers. The fabrics are textile materials that are knit, woven, non-woven, or non-conventional in structure.

1.2 Symbols. Not applicable.

1.3 Applicability. These covers are used to protect the exterior finish of the vehicle while in storage. This specification is not for transit covers or temporary covers used within GM facilities.

1.4 Remarks. There are two types of vehicle protective covers. Type I is for covers designed for outdoor storage, and Type II is for covers designed primarily for protected or indoor vehicle storage.

2 References

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

2.1 External Standards/Specifications.

ISO 105-A03	ISO 5084	ISO/IEC 17025	SAE J2527-A
ISO 105-X12	ISO 9001		

2.2 GM Standards/Specifications.

GMW3010	GMW3211	GMW3326	GMW6992
GMW3059	GMW3221	GMW4217	GMW14102
GMW3182	GMW3259	GMW4726	GMW14124

3 Requirements

3.1 Requirements on Test Specimens.

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

3.1.2 Sampling and Test Specimen Preparation. All test specimens shall be taken from the area beyond the initial 2 m of production and at least 50 mm from either selvage edge. Prepare test specimen as required in the respective test procedure.

3.1.3 Visual Evaluation of Automotive Trim (GMW6992). The color, pattern, aesthetics and other related qualities shall be evaluated and approved by the responsible Engineering department as an acceptable match to the Engineering approval sample when viewed under conditions set forth in GMW6992.

3.1.4 Deviation from Defined Test Procedures. Deviations from the conditions of any test procedure shall be agreed upon between supplier and vehicle manufacturer. All deviations shall be specified on the component drawings, material construction specification form, and Statement of Requirements and shall be indicated as such on test certificates and reports.

3.1.5 Lab Accreditation. Lab testing shall be performed by a laboratory that conforms to ISO/IEC 17025 or ISO 9001 and is acceptable to the responsible GM engineer. Supplier shall submit documentation showing proof of accreditation.

3.2 Construction Requirements for all Applications. These requirements describe the initial testing to be completed for a new fabric construction. Requirements for Type I and Type II applications are listed in Table 1.

3.2.1 Weight (GMW3182). Report the average in grams per meter squared (g/m^2) for the fabric weight and the total weight if laminated. Acceptable production tolerances shall be $\pm 6\%$, unless otherwise stated on the component drawing.

3.2.2 Thickness (ISO 5084). Report the average for three specimens in millimeters (mm) to the nearest 0.01 mm. Use a 2.0 N load and a 50.5 mm diameter presser foot to achieve a pressure of 1.0 kPa. For foam laminates, use a 4.0 N load and a 200 mm ± 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. Acceptable production tolerance will be $\pm 10\%$ for fabric materials unless otherwise specified on the construction drawing.

3.2.3 Tensile Strength (GMW3010, Code A). Test three specimens each from the Machine Direction (MD), Cross Machine Direction (CMD), and bias left and bias right directions. Report the average tensile strength at break.

3.2.4 Tear Strength, Trapezoid Tear (GMW3326). Test three specimens from the MD and three specimens from the CMD. Report the average for each direction in newtons (N).

3.2.5 Stretch and Set (GMW3211). Test three specimens from the MD and three from the CMD. Report the average for each direction. The maximum allowable stretch is 25%; the maximum allowable set is 4%.

3.2.6 Crocking (ISO 105-X12). The results shall be ≥ 4 when compared to the ISO Grey Scale for Staining, ISO 105-A03 after ten strokes back and forth for both wet and dry conditions. For wet testing, use a 65% $\pm 5\%$ wet pick up of the crocking cloth.

3.2.7 Water Spotting (GMW14102). Specimen size shall be 400 mm x 400 mm. Amount of water used shall be 5.0 mL. Perform the water spotting procedure three times on the same area, allowing the specimen to dry for at least 24 h after each application of water. Evaluate after each drying process and report the most noticeable results. No staining, ring formation or haptic change is allowed. If the water wicks to the edge, increase the specimen size.

3.2.8 Mildew (GMW3259). There shall be no visible growth or odor of mildew.

3.2.9 Dimensional Stability (GMW4217 and GMW14124, Cycle M). Dimensional change shall be $\leq 1.5\%$ in the MD and CMD. The specimen shall exhibit a satisfactory rating which is no degradation or no delamination of the layers, foam, or film.

3.2.10 Water Repellency (GMW4726). Report the water repellency; the requirement is 8 or higher.

3.2.11 Color Fastness to Artificial Light, Xenon Arc Method (SAE J2527-A). Exposure to Xenon Arc Weatherometer, extended ultraviolet (UV) filters. Report ΔE after indicated exposure in Table 1.

Table 1: Construction Requirements

Test Class	Test Procedure	Units	Requirement	
			Type I	Type II
Weight	GMW3182	g/m^2	Report	Report
Thickness	ISO 5084	mm	Report	Report
Tensile Strength	GMW3010	N	200	150
Tear Strength	GMW3326	N	100 minimum	100 minimum
Stretch	GMW3211	%	25 maximum	Not required
Crocking	ISO 105-X12	ISO Grey Scale	≥ 4	≥ 4
Water Spotting	GMW14102	-	No change	Not required
Mildew	GMW3259	-	No odor or growth	No odor or growth
Dimensional Stability	GMW4217, GMW14124,Cycle M	%	1.5 maximum	5.0 maximum
Water Repellency	GMW4726	-	8 minimum	Not required
Color Fastness to Artificial Light	SAE J2527-A	ΔE	Report ΔE after 1000 kJ exposure	Report ΔE after 500 kJ exposure

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