

INTERIOR TRIM PARTS PERFORMANCE

GM2617M

1 SCOPE. This specification covers the performance requirements of instrument panels, consoles, door trim, quarter trim panel, garnish moldings, armrests, headrests, assist handles, rear seat to back window trim panel and seat trims. This specification replaces, but does not supersede GM2740M, GM2741M, GM2797M, GM7454M, GM7451M, and GM2739M.

1.1 SUGGESTED DRAWING. NOTE: Performance to meet GM2617M for ____; (fill in component per Table 1C).

Natural weathering per GM9538P U/G-TSTL-XXX (fill in temperature per Table 1C) to XXXXX SASR Langleys (fill in langleys per Table 1C).

2 REFERENCED STANDARDS.

GM502M	GM7454M	GM9316P
GM1000M	GM9032P	GM9318P
GM2739M	GM9059P	GM9505P
GM2740M	GM9069P	GM9538P
GM2741M	GM9070P	GM9736P
GM2797M	GM9141P	GM9900P
GM3602M	GM9150P	AATCC TM8
GM3608M	GM9200P	SAE J1351
GM4350M	GM9310P	SAE J1756
GM7451M	GM9315P	SAE J1885

3 SPECIFICATION CONFORMANCE.

3.1 RAW MATERIAL SPECIFICATION CONFORMANCE. The components of the assembly must meet the individual material specifications shown on the drawing in addition to meeting the requirements of this specification.

3.2 SUBASSEMBLY PERFORMANCE SPECIFICATION CONFORMANCE. All subassemblies (i.e., electrical switches, audio components, etc.) must meet their individual performance specification in addition to meeting the requirements of this performance specification. All electrical components must pass a full load electrical test at the assembly source.

3.3 DESIGN AND MANUFACTURE FOR THE ENVIRONMENT.

3.3.1 Restricted and Reportable Chemicals (GM1000M). All materials supplied to this specification must comply with the requirements listed in GM1000M, "Restricted and Reportable Chemicals".

3.3.2 Recycling Guidelines (GM502M). Materials developed to this specification shall be optimized to provide maximum end-of-life value utilizing the Recyclability Checklist and GM Recycling Design Guidelines. Recycled content shall be reported to the approving and procuring Materials Engineering Department utilizing the Recycled Content Report Form. Reference the GM Recycling Design Guide, GM502M.

4 REQUIREMENTS. The following must be met by all assemblies. All assemblies shall be conditioned for 24 h minimum @ $21 \pm 2^\circ\text{C}$ and $50 \pm 5\%$ RH and tested under standard conditions of $21 \pm 2^\circ\text{C}$ and $50 \pm 5\%$ RH, unless otherwise specified in Table 1.

4.1 TEST PLAN. All testing shall be performed on samples from the finished assembly. Test samples are to be cut from production intent parts and consist of the entire cross section of the part i.e., paint, skin, filler, ionomer film and retainer, unless otherwise specified in the test plan. When production assemblies are not available a test plan must be agreeable to the appropriate platform release, materials and validation engineers in conjunction with the assembly supplier. The test plan shall include the following:

1. Definition of production intent composite (substrate, foam, adhesive, and covering material, etc.)
2. Tooling Level. Composite to be manufactured from current production tools, old tools, or prototype tools which most closely approximate the design intent assembly.
3. Process Description. Process shall be documented and closely approximate that of the design intent assembly.
4. Define natural weathering exposure per GM9538P.
5. Specify colors to be tested. Typically, if a part construction is a new design, then all colors shall be tested. If the part construction is not a new design, then only the new colors for that model year shall be tested.

4.2 NATURAL WEATHERING EXPOSURE TESTING (GM9538P U/G-TSTL-XXX). The production assembly or production intent assembly per 4.1 shall be tested attached to a fixture to simulate production attachment. The assembly shall be exposed at the temperature (XXX) and to the SASR (Seasonally Adjusted Solar Radiation) requirement shown on Table 1, unless otherwise specified on the engineering drawing.

4.2.1 The assembly shall not show any objectionable surface deterioration, color or gloss mismatches, warpage, sag, staining, delamination or other undesirable effects after the exposure. No objectionable change in appearance is defined as a rating of 6 or greater on the Degradation Rating Scale per GM9538P. Visual evaluation of the overall assembly by the GM Design Responsible Engineer and Materials Engineer shall override measured values in cases of disagreement.

4.2.2 Objectionable color change shall be defined as a measured color change ΔE of greater than 3.0. Color readings shall be measured in the same location on the sample before and after exposure per CIELAB color space, 10° observer, illuminant D6 specular included. Exposed samples may be wiped with a solution of water and mild detergent and blotted dry with a clean white cloth before the color reading is taken. Visual evaluation of the overall assembly by the GM Design Responsible Engineer and Materials Engineer, shall override measured values in cases of disagreement.

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4.2.3 Textile shall exhibit a rating of 3 or greater using the American Association of Textile Chemists and Colorists (AATCC) Gray Scale. Visual evaluation shall override gray scale rating in cases of disagreement.

4.2.4 At the discretion of the GM Design Responsible Engineer and Materials Engineer Colorfastness results may be used for approval until Natural Weathering is completed.

4.3 COLORFASTNESS (SAE J1885). Samples from the finished assembly or samples representing each production intent component shall be exposed in a xenon arc apparatus to the requirements of the covering material specification. Refer to Table 1 for individual part requirements. A skin/filler combination with a minimum thickness of 10 mm is to be used, unless otherwise specified.

4.3.1 The exposed samples must not show any surface deterioration, staining, objectionable color or gloss change, or any other undesirable effect due to the method or process from which the substrate is combined with the covering material and components.

4.3.2 The accelerated weathering samples from each of the component parts shall be combined and evaluated to determine if there is a shift in hue, or a mismatch in color.

4.3.3 After exposure the δE reading for plastic parts shall be no greater than 3.0 units when measured in the same location on the sample before and after exposure. Exposed samples may be wiped with a solution of water and mild detergent and blotted dry with a clean white cloth before the color reading is taken.

4.3.4 Visual color change which is considered objectionable/acceptable by the GM Design Responsible Engineering Group can override the δE value.

4.4 CHEMICAL RESISTANCE (GM9900P, PROCEDURE A). There shall be no staining, discoloration, surface softening, or loss of grain when each color and component of the part construction is tested. In addition, color transfer to a clean white cheesecloth shall have an AATCC rating of Class 4 or better.

4.5 COLOR CROCKING (AATCC TM8). The AATCC Chromatic Transference Scale rating for each color of the part construction shall be Class 4 or better for both wet and dry color crocking.

4.6 DIMENSIONAL STABILITY (GM9505P, CYCLE M). When the panel assembly is mounted either in a vehicle body or an appropriate test fixture, it must withstand the number of cycles and temperature specified in Table 1. There shall be no objectionable distortion, color or gloss change, odor, warping, sag, staining, delamination, or other undesirable effects.

4.6.1 The maximum dimensional change must not be greater than the dimensional change allowed for each color in the assembly drawing, and the dimensional changes should be within build tolerances.

4.6.2 Evaluation of the above conditions are to be made during each step of the cycle, immediately after removal from the test chamber and again 2 h later.

4.6.3 For rear-seat-to-back-window trim panels with speaker grilles, the dimensional stability test as detailed in 4.6 shall be performed with a weight of 1000 g placed over the speaker perforation and/or marked in the engineering drawing. This weight shall be distributed over an area of 150 x 200 mm.

4.6.4 For leather seats an additional evaluation should be completed under the following conditions: expose seats for 48 h @ 21°C and 95% RH. The seat cover should not exhibit objectionable wrinkles. Some seat cover designs may be wrinkled as design intent, therefore objectionable wrinkling must be decided based on seat cover design and customer requirements.

4.7 DIMENSIONAL STABILITY OF TEXTILE COMPONENTS. When the panel assembly is mounted either in a vehicle body or an appropriate test fixture, it must withstand 1 complete cycle of Cycle N detailed in GM9505P without exhibiting any objectionable distortion, color change, odor, warping, sag, staining, delamination, or other undesirable effects. Evaluation of the above conditions are to be made during each exposure to the environment. If material is bonded 100%, this requirement is optional.

4.8 VARIABLE SURFACE TEMPERATURE HEAT EXPOSURE (GM9310P, 168 h). There shall be no discoloration, shrinkage, distortion, exudation, bridging, gloss change, darkening, voids, loss of grain definition or other objectionable change after being exposed for 168 h with the surface temperature at the classification temperature indicated in Table 1. There shall be no separation of the materials of construction and skins shall show no bridging, bubbling, wrinkling or peeling back of edges after heat exposure.

4.9 THERMAL OXIDATIVE STABILITY FOR POLYPROPYLENE PARTS (GM9059P). To insure compatibility of the pigment with the base material and to prevent unstabilized material from being used, parts or portions or parts shall be tested for 336 h per GM9059P. After exposure, the material must not show any embrittlement or other evidence of material degradation.

4.10 RESISTANCE TO HUMIDITY. There shall be no tackiness, blooming, loss of adhesion or other change after part is exposed for 96 h @ $38 \pm 2^\circ\text{C}$ and $95 \pm 5\%$ RH (Non Condensing).

4.11 IMPACT STRENGTH (GM9032P, 3.9 J @ $-30 \pm 2^\circ\text{C}$ BELOW BELTLINE, 2.0 J ABOVE BELTLINE). When the panel assembly is mounted either in a vehicle body or an appropriate test fixture, it must withstand an impact on the location indicated by the engineering drawing. The panel assembly that has been cycled per (dimensional stability 4.1) should be placed back in the cold chamber @ $-30 \pm 2^\circ\text{C}$ and impacted after it has been exposed for 4 h.

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4.12 ADHESION REQUIREMENTS.

4.12.1 I/P's, Consoles. The adhesive bond strength, 180° peel, between typical adjacent materials such as retainer/film, retainer/foam, film/foam, foam/skin, and retainer/skin, shall be 525 N/m minimum after each step, within 15 s of the appropriate cycle in GM3602M. If foam split occurs at a value below 525 N/m, this is considered a pass. Run a 90° peel when testing the bond strength between a retainer and the flexible adjacent material.

4.12.2 Door Trim, Pillar Trim, Quarter Panel Trim, etc.

The adhesion requirements of carpet bonded to substrate is covered in GM3608M. Adhesively attached components (i.e., sound absorbers, trim plates, appliques, cloth inserts, etc.) must meet a minimum peel strength of 525 N/m after each step (within 15 s) of the appropriate cycle in GM3602M, or exhibit cohesive failure of either the adherent or the substrate. If the inert is fully recessed protecting all edges, or if a non flexible adherent is used, there is no peel strength requirement, but there should be no lifting of the edges following exposure to 2 cycles of GM9505P Cycle M, or 1 cycle of GM9505P Cycle N (textile components only).

4.12.3 Bonded Seats. When seat covers are bonded to foam buns, they must conform to GM3602M. The peel strength shall be 875 N/m or the cohesive failure of the foam should be at least 275 N/m.

4.13 STAINING. The part construction must be compatible with all adjacent materials. Place the part in contact with the adjoining material, depending upon the application, with 3.53 kPa pressure to insure contact for 72 h @ $70 \pm 2^\circ\text{C}$. If the parts are assembled so that there is movement, there shall be no migratory staining. If the parts are assembled so that there is movement that will reveal discoloration, there shall be no contact staining. Reference GM9141P for the required apparatus, test procedure and evaluation of results.

4.14 SCUFFING AND MAR RESISTANCE (GM9150P).

There shall be no marring when each color of the part construction is tested as received and after oven aging for 24 h @ $93 \pm 2^\circ\text{C}$ in an air-circulating oven.

4.15 RESISTANCE TO HYDROGEN SULFIDE AND SULFUR DIOXIDE STAINING - VINYL SKINS ONLY (GM9069P, 10 s AND GM9736P, 25 MIN). There shall be no yellowing or shade alteration of the part construction after exposure.

4.16 FOGGING (SAE J1756). Photometric procedure: Bath temperature as specified in Table 1; cooling temperature of 38°C ; 6 h test time; 16 h post conditioning time. The amount of fog when measured with a 60° glossmeter shall have a rating of 60 units or more. Samples that result in a residue that forms a transparent film, discernible droplets, or any visual signs of crystallinity, when viewed under 200X magnification shall be judged to have not passed this requirement.

4.17 ODOR (SAE J1351). The material must have an odor scale rating number of 3 or lower.

4.18 FLAMMABILITY (GM9070P). The material shall not burn or transmit a flame front across its surface at a rate greater than that specified in Table 1 of GM9070P, after the following conditions: as received, after accelerated aging (GM9200P) and after steaming (GM9200P). If a specimen has a designated burn rate of DNI, SE, or SE/NBR the resultant burn rate for use in Table 1 shall be a 0.

NOTE: If the material is a composite (as defined in the test procedure) or is to be used in a composite, the composite must meet this requirement.

4.19 PAINT PERFORMANCE (GM4350MCLASS CO).

Paint performance of each color of the part construction shall meet the requirements of GM4350M Class C0. Only approved combinations listed in APOPS (Approved Paint on Parts System) database to be used.

4.20 ARMREST FATIGUE RESISTANCE. No visual deterioration and a hardness change of less than 30%, measured per drawing specifications 1/2 after completion of cycling, after 10 000 cycles @ 30 CPM (cycles per minute) using a 38 mm dia indenter and indentation of 50% of the effective foam thickness.

4.21 INDENTATION RECOVERY. Using a minimum 10 mm thick section and/or point or points specified on the assembly drawing, the part shall fully recover after 1 h from an indentation caused by a constant deflection in which a 19 mm dia ball is pushed into the surface to a distance equal to 1/3 the foam thickness and held for 15 s. This test is to be performed on components as received and after dimensional stability per 4.1.

4.22 SPEAKER OPENING OBSTRUCTIONS. The perforated speaker openings for assemblies containing these provisions must be clear of obstructions, i.e. there must be no excessive adhesive residue or substrate flash present in the perforations.

4.22.1 Sound Transparency (GM9318P). Materials intended for use as a covering for an audio speaker must exhibit satisfactory audio test results as determined by a GM Design Responsible Engineer per GM9318P. Broadband deviation 2/3 of an octave or less in bandwidth, shall not exceed 3.0 dB.

4.23 JOUNCE AND SQUIRM (GM9316P). The H-point measurement will be recorded before and after testing. Test duration is 100 000 jounce and squirm cycles. As a minimum there shall be no objectionable change in appearance such as wear through the trim cover to the backing or russet, broken attachments or disengagement of trim cover from cushion or back, thread failures, material/cover delamination, or degradation of the under structure and all adjustable functions must be operational.