



Polyester Powder Topcoat for Parts

1 Scope

1.1 Material Description. This specification describes the requirements for a polyester powder topcoat to be used on exterior component parts.

1.2 Symbols. Not applicable.

1.3 Applicability. These topcoats are designed to be applied over a primer. Typical applications include A, B and C pillar post appliques.

2 References

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

2.1 External Standards/Specifications.

ASTM D153 ASTM D1895 ASTM D3451

2.2 GM Standards/Specifications.

GM9620M GMW3005 GMW3059 GMW15777

2.3 Additional References.

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

3 Requirements

3.1 Submission. The submission requirements of GMW3005 must be completed prior to approval of the topcoat system. The supplier must clearly define the usage target.

3.2 Durability Performance. Systems approved under this specification must meet the minimum performance requirements of a Type A, Class 3 topcoat as described in GMW3005.

Note: Class 3 topcoat systems provide a three (3) year exterior durability in environmental testing, i.e., Florida exposure.

3.3 Panel Preparation. Panels are to be prepared for Types B.

3.4 Processing Requirements. These topcoats are designed to be applied over a baked primer.

3.5 Appearance. The topcoat system must meet or exceed the requirements as designated in GMW15777.

3.6 Additional Requirements.

3.6.1 Material Chemistry. The paint shall be supplied in powder form and be at least 65% polyester.

3.6.2 Film Build. All durability and appearance requirements must be met within a minimum range of 38 μm to 102 μm (1.54 mil to 4 mil). Film build not to exceed 102 μm (4 mil) including inline repairs. Individual colors may have narrower ranges for optimum appearance. Individual colors may also have higher film builds than the technology minimum due to hiding or ultraviolet opacity. The acceptable range for a color will be established during annual pigmentation evaluation (GM9620M) and will be released by GM Manufacturing Engineering Vehicle Systems – Paint, as the GM9620M Approved Color Source List, available by model year from the paint source. Refer to the approving Paint Engineer for additional information in regard to exceptions for the typical processing film build ranges.

3.6.3 Bake. Products that are approved to this standard have a typical bake range of 185 °C to 216 °C (365 °F to 420 °F). Time at substrate temperature typically varies from 10 minutes to 60 minutes. Refer to the approving Paint Engineer for additional information in regard to exceptions for the typical processing bake temperature and time ranges.

3.6.4 Bake Window. Cure charts must be developed as specified in GMW3005 to define technology limits for each product. Once developed and approved, the bake chart is signed by GM Vehicle Systems Engineering - Paint and is the only acceptable document for defining cure.

3.6.5 Particle Size. Supplier shall identify particle size and distribution per ASTM D3451. Electronic Counting Analysis is the preferred method.

3.6.6 Volatile Content. Mass percent solids and volatile content shall be determined using ASTM D3451.

3.6.7 Density and Specific Gravity. Apparent density and its bulk factor shall be determined in accordance with ASTM D1895. For specific gravity determinations, use ASTM D153 or with modifications as described in ASTM D3451.

3.6.8 Gel Time. The mean gel time of the product shall be determined in accordance with ASTM D3451.

3.7 Processability Testing. Pertinent sections of this specification must be performed.

3.7.1 Appearance. Production representative electrostatic powder gun shall be used. Report fluidizing air pressure, electrostatic voltage, feed and conveyance (or equivalent) air pressures, and powder low in ounces (lb)/minute.

3.7.2 Fluidization Characteristics. Evaluate the fluidization of the powder at different air pressures, particle size distributions, and humidity levels. The fluidization system used must be production representative.

3.7.3 Flow and Sintering Characteristics. Using a gradient bar oven at target film builds, determine the time versus temperature profiles for flow and sintering properties.

3.7.4 Gel Time/Tack Free. Determine the amount of time needed to achieve a tack-free surface when temperature is at the target bake. This may be accomplished using ASTM D3451.

3.7.5 Package Stability. Package stability with respect to the heat and moisture exposure shall be established per ASTM D3451 modified as necessary to simulate shipping procedures to address the unique characteristics of the powder's bulk handling needs.

4 Manufacturing Process

Not applicable.

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.

If not otherwise agreed, all release tests shall be repeated and documented by the supplier prior to commencement of delivery of non-conforming bulk supplies. In individual cases, a shorter test can be agreed to between the responsible Engineering department and the supplier.

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. In addition, product MSDS/SDS submissions must be in compliance with specific country General Motors TMC003 Material Safety Data Sheet/Safety Data Sheet guidance documents where available.

5.5 All materials supplied to this standard must comply with the requirements of GMW3059, Restricted and Reportable Substances for Parts.