



Conductive Prep Coat for Plastics, Waterborne

1 Scope

This specification covers the requirements for a waterborne, conductive preparation (prep) coat for non-conductive plastic substrates that normally do not require a primer for intercoat adhesion or ultraviolet (UV) protection (e.g., Acrylonitrile Butadiene Styrene (ABS), Acrylonitrile Butadiene Styrene plus Polycarbonate (ABS+PC), Thermoplastic Polyurethane (TPU)).

1.1 Material Description. This conductive prep coat is part of a total painted product system and must meet requirements set forth in the specifications for other materials with which it is used. This specification shall be used in conjunction with the Approved Paint on Plastics System (APOPS) (GMW14797), a section of the Materials Specification file (MATSPC) which lists approved substrate, cleaning, priming and topcoat combinations. Specified herein are material requirements per the GM Vehicle Systems-Paint Materials and Facilities Department. These specifications are used to verify that the materials have been processed to produce a finished product of quality consistent with that proven in initial qualification testing.

1.2 Symbols. Not applicable.

1.3 Typical Applications. Typical applications may include painted exterior grilles or mirror housing where a conductive prep coat can help improve film build and color uniformity of the topcoat system.

2 References

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

2.1 External Standards/Specifications.

ISO/TS 16949

2.2 GM Standards/Specifications.

9984801	GM4365M	GMW3059	GMW15777
GMW3005	GM4389M	GMW14797	

2.3 Additional References.

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

3 Requirements

3.1 Performance Requirements. Material submitted for qualification to this specification must meet the requirements of GM4365M. For wet-on-wet applications, the prep coat film build condition variance identified in GM4365M shall be those of the prep coat; the bake condition variance shall be those of the topcoat as defined by GMW3005. Because of the potential interactive effects between prep coat and topcoat interface, wet-on-wet processing constitutes a system qualification. As such, the candidate prep coat shall be approved only in conjunction with the tested topcoat. Should a different topcoat be desired, requalification of this prep coat with the new topcoat will be required. In addition, the requirements that follow shall be met on all surfaces of the part or as designated by the applicable GM Product Engineering documents.

3.1.1 Appearance. Must meet the requirements of GMW15777 after topcoat. In addition, the prep coat should be pigmented with a tracer or contrasting pigment to visibly ensure coverage is achieved. The composition of the pigment package and pigment-to-binder ratio must be documented.

3.1.2 Dry Film Conductivity. The dry film conductivity of the coating film shall be determined. A coating shall be deemed conductive if a maximum reading of 4 MΩ is obtained.

3.2 Processing Requirements.

3.2.1 Surface Preparation. Power wash per 9984801.

3.2.2 Application. Reduce and apply uniformly to achieve the dry film thickness specified per supplier recommendation. Number of coats and flash time between coats and to oven shall be regulated to avoid popping or other detrimental effects.

3.2.3 Processing. This prep coat is processed using either of the following two methods:

- a. The prep coat is applied and then baked prior to application of an approved topcoat system.
- b. The prep coat is applied wet on wet and co-baked with an approved topcoat system.

Each type of processing requires separate testing and approval.

3.2.4 Bake. Surface of the part must be within the range of time and temperature per the primer's bake chart on file with Vehicle Systems-Paint Materials and Facilities Engineering. Time in the oven and ambient temperature must be regulated to meet this requirement without exceeding overbake/underbake specifications. For wet-on-wet applications, the surface of the part must be within the range of time and temperature per the topcoat's bake chart on file with Vehicle Systems-Paint Materials and Facilities Engineering.

3.3 Production Part Approval Process (PPAP). Product approval is required under established guidelines outlined in ISO/TS 16949. At product approval, the supplier is expected to have reviewed to GM's satisfaction specific documentation outlined in Advanced Product Quality Planning (APQP) (i.e., Product Design Failure Mode & Effects Analysis (DFMEA), Process Failure Mode & Effects Analysis (PFMEA), Key Product Characteristics (KPC), Key Control Characteristics (KCC), Measurement Systems Analysis (MSA), and Manufacturing Control Plans).

4 Manufacturing Process

All shipments of material or parts under contract or purchase order manufactured to this standard shall be equivalent in every respect to the initial samples approved by GM Engineering. There shall be no changes in either formulation or manufacturing processes permitted without prior notification and approval by GM Engineering. Lack of notification by the supplier constitutes grounds for rejection of any shipment. While samples may be taken from incoming shipments and checked for conformance to this standard, the supplier shall accept the responsibility for incoming shipments meeting this standard without dependence upon purchaser's inspection.

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.

5.3.1 In addition, the supplier shall be responsible for submitting a Certificate of Analysis with each batch of material arriving at a plant. The document shall be prepared and provide the data in accordance with the requirements detailed in GM4389M.