



Stand-alone Adhesion Promoter, Low Bake

1 Scope

This specification covers the requirements for a low bake 80 °C (180 °F) solventborne or waterborne stand-alone adhesion promoter for thermoplastic olefins (TPO). The adhesion promoter may be conductive or non-conductive, depending on the needs of the user.

1.1 Material Description. This adhesion promoter is part of a total painted product system and must provide a smooth, adhesion-promoting coating direct to substrate, specifically TPO. This specification shall be used in conjunction with the Approved Paint on Plastics Systems (APOPS), a section of the GM Materials Approved Source List, which lists approved substrate, cleaning, priming, and topcoat combinations. APOPS test requirements are defined in GMW14797.

1.2 Symbols. Not applicable.

1.3 Applicability. This primer/adhesion promoter can be used on TPO only and is generally used on service part applications.

1.4 Remarks. Not applicable.

2 References

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

2.1 External Standards/Specifications.

IATF 16949

2.2 GM Standards/Specifications.

9984801	GMW14270	GMW15777	GMW17405
GMW3059	GMW14797	GMW17105	

2.3 Additional References.

Advanced Product Quality Plan (APQP)

Applicable Material Engineering Documents

Approved Paint on Plastics Systems (APOPS)

GM Materials Approved Source List

Safety and Industrial Hygiene (S&IH) Technical Standard (TS), S&IH TS 3.4-160-02

3 Requirements

3.1 Performance Requirements. Material submitted for qualification to this specification must meet the requirements of GMW17105. In addition, the requirements that follow shall be met on all surfaces of the part or as designated by the applicable material engineering documents.

3.1.1 Appearance. Must meet the requirements of GMW15777 after topcoat. In addition, the adhesion promoter 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 Processing. These adhesion promoters are designed to be baked prior to topcoat.

3.2.3 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.

3.2.4 Film Build. Apply uniformly to achieve a film thickness of 10 µm to 15 µm (0.4 mil to 0.6 mil) of adhesion promoter.

3.2.5 Flash. Typically, a 2 minute to 4 minute flash time is required before baking.

3.2.6 Bake. Products that are approved to this standard have a typical bake range of 82 °C to 100 °C (180 °F to 210 °F). Time at substrate temperature typically varies from 20 minutes to 90 minutes. Refer to the approving paint engineer for additional information regarding exceptions for the typical processing bake temperature and time ranges.

3.2.7 Bake Window. Cure charts must be developed as specified in GMW17105 to define technology limits. Once developed and approved, the bake chart is signed by Vehicle Systems-Paint Materials and Facilities and is the only acceptable document for defining cure.

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

3.4 All materials supplied to this standard must comply with GMW3059, **Restricted and Reportable Substances**, including the requirement to submit a full material composition disclosure to GM via the International Material Data System (IMDS) or via a completed GMW3059 report form.

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.

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 GMW17405.

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