

Wet on Wet Primer/Basecoat/Clearcoat Systems

1 Scope

This specification covers the qualification and performance for an exterior, solventborne primer/solventborne basecoat/solventborne clearcoat or solventborne primer/monocoat system for use over plastic substrates. Products approved under this specification are "wet on wet" systems and are not to be used on large horizontal surfaces.

1.1 Material Description. The primer may be conductive or nonconductive depending on the needs of the user. Topcoats (basecoat/clearcoat, monocoat) are those approved to GMW3005.

1.1.1 Each combination of specific primer, basecoat and clearcoat (or primer/monocoat) must be tested and approved as a primer/basecoat/clearcoat system (primer/monocoat system). The individual components are not interchangeable, and are approved for use only with combinations of primers, basecoats, or other components of the total paint system which were used in qualification testing.

1.1.2 This specification shall be used in conjunction with the Approved Paint on Plastic System (APOPS), a section of the GM Materials Approval Source List, which lists the approved substrate, cleaning, priming, and topcoat combinations. APOPS test requirements are defined in GMW14797.

1.2 Symbols. Not applicable.

1.3 Applicability. These systems are designed to be applied directly to plastic substrate and are not intended to be used on large horizontal surfaces.

1.4 Remarks. Not applicable.

2 References

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

2.1 External Standards/Specifications.

ISO 2808 ISO/TS 16949

2.2 GM Standards/Specifications.

9984801	GMW3059	GMW14797	GMW17434
GMW3005	GMW14270	GMW15777	

2.3 Additional References. None.

3 Requirements

Primer/topcoat systems submitted for qualification to this specification must meet the requirements of GMW3005. Because of the potential interaction, wet on wet processing constitutes a system qualification. As such, the candidate primer shall be approved only in conjunction with the tested topcoat system. If a different topcoat system is desired, then qualification of this primer with the new topcoat system will be required. Additionally, the requirements in this material specification shall be met on all surfaces of the part or as designated by the applicable Product Engineering Documents.

3.1 Durability Performance. Systems approved under this specification must meet the minimum performance requirements of a Class Two (2) topcoat as described in GMW3005. The Topcoat Type B and/or Type C testing requirements shall be determined by the targeted usage.

3.2 Etch Resistance. Coatings approved under this specification are expected to provide to the customer a finish that will prevent or minimize environmental etch and water spot damage. Minimum etch rating is six (6)

per the Jacksonville Rating Scale, as defined in GMW3005, or equal to typical Original Equipment Manufacturer (OEM) body system controls for a given exposure test.

3.3 Appearance. The topcoat system (basecoat/clearcoat) must meet or exceed requirements as designated in GMW15777.

3.4 Compatibility. Compatibility with associated materials is evaluated for Type B and/or Type C usage per GMW3005.

3.5 Processability. General processability must be demonstrated per GMW3005. The process used to create the test panels must be production capable.

3.6 Panel Preparation. Panels are to be prepared for Type B and Type C materials per GMW3005.

Note: Power washing per 9984801 is required. Deviation must be approved by the involved GM Vehicle Systems Engineering - Paint Engineer.

3.7 Flash. A flash time of one (1) minute to two (2) minutes between coats of primer and three (3) minutes to six (6) minutes between primer and basecoat application is typical. A flash time of one (1) minute to two (2) minutes between coats of basecoat or coats of clearcoat, and three (3) minutes between basecoat and clearcoat application is typical. Clearcoats are applied wet-on-wet over basecoats. Six (6) minutes of flash is typical prior to oven entrance. Refer to the approving paint engineer for additional information regarding exceptions to the typical processing flash time ranges.

3.8 Film Build (ISO 2808). Typical primer film build is 20 µm to 25 µm (0.8 mil to 1.0 mil). Individual basecoat colors may have higher minimum film builds than the technology minimum due to hiding or Ultraviolet (UV)/Visible (VIS) transmission requirements. The acceptable range for a color will be established during annual pigmentation evaluation (GMW17434) and will be released by GM Vehicle Systems Engineering- Paint as the GMW17434 Approved Color Source List, available by model year from the paint source. The clearcoat must meet all specified appearance and durability requirements at a minimum film of 38 µm (1.5 mil).

3.8.1 Film Build Latitude. The specific clearcoat film build range for individual technologies must be established by Designed Experiment or a matrix ranging from 25.4 µm to 63.5 µm (1.0 mil to 2.5 mil).

3.8.1.1 Performance criteria are Xenon Weatherometer, Florida exposure, flexibility, humidity adhesion, and chip resistance. Values will be noted on the Approved Source List for the Specific Technology.

3.9 Bake.

3.9.1 Low Bake. Products that are approved to this standard have a typical bake range of 82 °C to 135 °C (180 °F to 275 °F). Time at substrate temperature typically varies from 20 minutes to 90 minutes. Refer to the approving paint engineer for additional information regarding exceptions to the typical processing bake temperature and time ranges.

3.9.2 High Bake. Products that are approved to this standard have a typical bake range of 115 °C to 135 °C (240 °F to 275 °F). Time at substrate temperature typically varies from 20 minutes to 90 minutes. Refer to the approving paint engineer for additional information regarding exceptions to the typical processing bake temperature and time ranges.

3.10 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.

3.11 Chemical Requirements. All clearcoat reducers must be urethane grade or equivalent.

3.12 Special Handling. Component B (typically isocyanate), may require a dry nitrogen blanket to prevent the entry of moist air. Isocyanate materials in Component B will react with water, alcohols, and certain other materials. Therefore, precautions must be taken to ensure that none of these are present or introduced into storage containers or circulating systems containing materials noted here.

3.12.1 Safety. Special precautions must be taken to limit pulmonary inhalation of fumes and direct skin contact with unreacted isocyanate materials. Follow local plant safety procedures, agreements, and monitoring procedures.

3.13 Additional Requirements. 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). Examples of this documentation are to include, Design Failure Mode and Effects Analysis (DFMEA), Process Failure Mode and Effects Analysis