



Topcoat System, Low Bake 1K Waterborne Basecoat/2K Solventborne Clearcoat

1 Scope

This specification covers the qualification and performance requirements for exterior, one component (1K) waterborne basecoat and two component (2K) solventborne clearcoat topcoats that perform over bake latitude of 82 °C to 135 °C (180 °F to 275 °F).

1.1 Material Description. Basecoat components of these systems are typically 1K waterborne acrylic or urethane. Clearcoat components of these systems are flexible, 2K solventborne urethane or urethane blends. Each combination of specific basecoat and clearcoat must be tested and approved as a basecoat/clearcoat system. The individual components are not interchangeable, and are approved for use only with combinations of basecoat/clearcoat of the total paint system, which was used in qualification testing.

1.1.1 Specified herein are material requirements per the Manufacturing Engineering (ME) Vehicle Systems - Paint Materials and Facilities group. These specifications are used to verify 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 Applicability. These topcoats can be used on heat-sensitive plastics, flexible or rigid plastic parts.

Note: All Thermoplastic Polyolefin (TPO) substrates using 9986315 must be primed with a 9984905 or 9984908 adhesion promoter or flame treatment per GMW16133.

1.4 Remarks. Not applicable.

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	GMW3005	GMW14729	GMW15777
9984905	GMW3059	GMW14829	GMW16133
9984908	GMW14124		

2.3 Additional References. None.

3 Requirements

3.1 Requirements on Test Specimens. Not applicable.

3.2 Submission. GMW3005, Section 3 must be completed prior to approval of the product. The supplier must clearly define the usage target.

3.2.1 Additional Submission Requirements. Table 1 of this specification must be completed prior to approval of the topcoat system.

3.3 Durability Performance. Materials approved to this standard must meet all of the minimum requirements of GMW3005, Class 2, Types B and C.

3.4 Etch Resistance. Minimum etch rating is 6 per Jacksonville rating system, or equal to typical Original Equipment Manufacturer (OEM) body system controls for a given exposure test.

Table 1: In-Line Reprocess Matrix

Original Equipment Manufacturer (OEM) Film and Bake	Aging Before Recoat	Adhesion Promoter Before Recoat	Recoat Film and Bake	Initial Adhesion GMW14829	96 h Humidity Plus Adhesion GMW14729, GMW14829	Environmental GMW14124, Cycle A, GMW14729, GMW14829
L/H	72 h	No	T/T			
L/H	72 h	Yes	T/T			
H/L	72 h	No	T/T			
H/L	72 h	Yes	T/T			
L/H	2 weeks	No	T/T			
L/H	2 weeks	Yes	T/T			
H/L	2 weeks	No	T/T			
H/L	2 weeks	Yes	T/T			

Note: H = High (film build), L = Low (film build), T = Target.

3.5 Appearance. The material must meet or exceed corporate specification for gloss, Distinctness of Image (DOI), orange peel, and uniformity as designated in GMW15777.

3.6 Processing Requirements. Topcoats per this specification are designed to be applied over;

- Option 1: A low bake adhesion promoter approved to 9984905 or 9984908.
- Option 2: Flame treated TPO per GMW16133.
- Option 3: An approved baked primer.

3.6.1 Any wet-on-wet applications over primer must be evaluated as a separate paint system per this specification and the applicable primer specification.

3.7 Panel Preparation. Panels are to be prepared for Types B and D materials per GMW3005.

Note: Power wash per 9984801 is required. Deviations must be approved by the involved GM Vehicle Systems - Paint Materials and Facilities engineer.

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

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

3.9.1 Film Build. The clearcoat must meet all specified appearance and durability requirements at a minimum film of 38 µm (1.5 mil). Individual basecoat colors may have higher minimum 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, or Annual Color Program and will be released by GM Vehicle Systems - Paint Materials and Facilities group as the Approved Color Source List, available by model year from the paint source.

3.9.1.1 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). 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.

3.9.2 Flash. Flash is typically 1 minute to 2 minutes between coats of basecoat or coats of clearcoat. Waterborne basecoat requires a dry-off prior to clearcoat application that removes 85% to 95% of the water. Typical heated flash time before clear is 6 minutes to 8 minutes. The typical flash method is convection air at 88 °C to 99 °C (190 °F to 210 °F) air temperature with a turnover ratio of 5 to 6 times per minute. The parts must be cooled