



Primer - Final Line Reprocess

1 Scope

This specification covers the procedures and the minimum performance, compatibility, processing and general requirements for inline reprocess primers. Included are the requirements for:

- Production information
- Performance
- Processability

1.1 Material Description. The final line reprocess primer covered in this specification is intended for use in cut-through areas to provide a smooth, adhesion promoting, corrosion resistant coating compatible with a wet-on-wet application of primer surfacer or topcoat.

1.2 Symbols. Not applicable.

1.3 Applicability. The primer must be evaluated for plant specific material compatibility if the materials currently used in the target plant are different from those used to approve the technology. The primer must also be evaluated for plant specific process capability if the process limits are outside of those evaluated during qualification.

2 References

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

2.1 External Standards/Specifications.

ASTM D1474	ISO 2431	ISO 3251
ASTM D3960	ISO 2811	

2.2 GM Standards/Specifications.

GMW2	GMW14124	GMW14872	GMW15891
GMW8	GMW14700	GMW14873	GMW16639
GMW11	GMW14729	GMW15192	
GMW3059	GMW14829	GMW15545	

2.3 Additional References.

Not applicable.

3 Requirements

Individual material sources may differ in their physical or chemical properties. Upon submission, all material properties, system performance and system processing properties shall be established and documented. Such properties shall form the basis of all subsequent lots.

3.1 Submission Requirements.

3.1.1 Submission Letter. Prior to qualification testing, the supplier must submit a letter to the Manufacturing Engineering Vehicle Systems Paint and Seal Materials Engineer with the following information:

- Product name.
- Purpose of the submission.
- Description of the chemistry and components (full product formulation) and as compared to a current, approved technology.

- Site of origin and history of product evolution.
- Key data for environmental impact; e.g., Volatile Organic Compounds (VOC), weight solids, volume solids, etc.
- Material Safety Data Sheet (MSDS) (full disclosure).
- Product Data Sheet.

A summary of the product information required is shown on Data Sheet A1: Product Information

At completion of material testing, the supplier must provide at least two copies of the submission book to the requesting Manufacturing Engineering Vehicle Systems Paint and Seal Materials Engineer.

3.1.2 Material Identification. All paint layers and substrates used in the submission must be identified by the source, product code and batch, including color name WAXXXX (GM North America). All film builds and bakes are to be documented.

3.1.3 Process Identification. A baseline target and range for both film build and bake must be stated as part of the submission. Actual targets and ranges will be finalized following full evaluation of the data submitted per this specification. Application equipment and spray parameters are to be documented.

3.1.4 Health and Environmental Issues. The supplier must provide a Material Safety Data Sheet (MSDS) for all components of the primer technology. The MSDS will be reviewed by the Health and Environmental groups from each country.

3.1.5 Submission Package. The submission book must be prepared in two formats: A hard copy and an electronic copy. The book shall have a table of contents and tabs that make it easy to find each section. Sections shall be organized to follow the order of the specification so that information of interest can be readily located. The electronic copy must also be organized in the same manner. All test results, Key Control Characteristics (KCC) and Key Product Characteristics (KPC), photographs, and related interim approvals are to be included as a permanent record of the product. The books are to be in United States English and according to the local language.

3.2 Product Information.

3.2.1 Physical Constants. Data on all physical constants must be provided as formulated and as sprayed, if different. All reducing solvents used in the technology approval must be identified (Form 1 - Product Information).

3.2.2 Formulating Range. The formulating range of all ingredients must be specified at the time of submission. Information on the technology's ingredient formulation ranges for the various resin systems, pigments, flow control agents, additives, and key manufacturing control characteristics must be provided as part of the submission package. If a product change is proposed outside of the technology formulation limits, the responsible Manufacturing Engineering Vehicle Systems Paint and Seal Materials Engineer must be notified. All ingredient ranges, key manufacturing control limits, and certificate of analysis ranges must pass standard gage repeatability and reproducibility studies.

3.2.3 Infrared (IR) Chemical Fingerprint. The supplier must provide infrared data to document the fingerprint of the recommended formula. All materials subsequently supplied under the designated specification and material code must correspond to the reference spectrum when compared under the same conditions. GM may conduct infrared spectrophotometry analysis of the materials supplied to this specification. Analyses may also be performed on topcoat that is removed from representative panels with film thickness and bake at target levels. The IR spectra established for initial approval shall constitute a reference standard and shall be part of the submission package.

3.2.4 Ultraviolet (UV) Transmission (GMW15545). Samples must be prepared with primer alone at minimum film build and target bake and tested per GMW15545. The data shall be the following:

- $\leq 0.05\%$ transmission from 290 nm to 390 nm.
- Straight line from 0.05% transmission at 390 nm to 0.10% transmission at 430 nm.
- Straight line from 0.10% transmission at 430 nm to 0.80% transmission at 500 nm.

If the requirement causes a significant increase in pigment-to-binder (P/B) and/or cost, then the full system would need to be evaluated for UV requirements. The full system is defined as the primer and all the appropriate basecoat colors and clearcoat that will be applied over the primer. The system would have to pass the previous specification as follows:

- Primer: Lower limit of film build for durability (to be determined with this testing).

- Basecoat: Minimum film build for basecoat color.
- Clearcoat: Lower limit of film build for durability (38 µm).

3.2.5 Odor Characteristics (GMW16639). The material's odor potential must be compared with that of a current production material. Any solvent changes for plant-specific implementation must be reviewed to determine if retesting is required.

3.3 Performance Requirements. The primer system tested on the panels shall be representative of the production-intent primer system and processing. Refer to Data Sheet A2: Performance for all the tests and required values.

3.3.1 Panel Preparation. Prior to start of panel preparation, contact the responsible Manufacturing Engineering Vehicle Systems Paint and Seal Materials Engineer to ensure proper selection of substrate, pretreatment, electrodeposition (ELPO), topcoat and other miscellaneous materials.

3.3.2 Test Substrates. Test substrates to be used are determined by the responsible Manufacturing Engineering Vehicle Systems Paint and Seal Materials Engineer. ACT test panels may be used as test substrate except when noted. Table 1 outlines the typical substrates used. Other substrates may be selected as confirmed by the responsible engineer.

Table 1: Typical Substrates for Test Panels ^{Note 1}

Cold-Rolled Steel (CRS) (GMW2)
Hot-Dipped Galvanized (HDG) Steel (GMW8), 60 g/m ² Galvanized Coating Weight
Electrogalvanized Steel (EG) (GMW11), 60 g/m ² Galvanized Coating Weight
Aluminum (Al) (GMW15192)

Note 1: Other substrates may be selected per engineering agreement.

3.3.3 Test Layering Systems. The new reprocess primer shall be evaluated with the following paint layering systems:

- Substrate + reprocess primer + final line basecoat/clearcoat system/bake.
- Substrate + E-Coat/bake + reprocess primer + final line basecoat/clearcoat system/bake.
- Substrate + E-Coat/bake + primer surfacer/bake + reprocess primer + final line basecoat/clearcoat system/bake.
- Substrate + E-Coat/bake + primer surfacer/bake + Original Equipment Manufacturer (OEM) basecoat/clearcoat/bake + reprocess primer + final line basecoat/clearcoat system/bake.
- OEM system by itself for control purposes.

Form 2 identifies which layering system is required for each test. Specific test materials for each layer and any wet-on-wet applications will be specified by the Manufacturing Engineering Vehicle Systems Paint and Seal Materials Engineer.

3.3.4 Film Thickness. The film thickness range (minimum/maximum) and target shall be recommended by the supplier. All other coating layers shall be applied at their target film builds for testing.

3.3.5 Bake Conditions. This material must be sandable after air-dry or a maximum of six (6) minutes at 82 °C (180 °F). This product must meet all performance requirements with air dry or reprocess prime bake and with subsequent topcoat bakes.

All test panels shall be baked in direct gas-fired ovens, unless specified otherwise by the Manufacturing Engineering Vehicle Systems Paint and Seal Materials Engineer.

Note: Bake time refers to the amount of time the panel is exposed to the specified temperature after it has reached that temperature. Acceptable bake conditions are those in which appearance, performance and glass bonding requirements are met.

3.3.6 Sample Size. The number of samples will be agreed upon by the responsible Manufacturing Engineering Vehicle Systems Paint and Seal Materials Engineer and the supplier prior to the start of testing. All substrates, pretreatments, and coating layers shall be fully identified with source, product code, batch number, bake description, and film build.