GM WORLDWIDE ENGINEERING STANDARDS	General Specification	GMW17977

Vehicle Interior Painted Plastic Add-On Parts Process Requirements

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This standard describes the process requirements for painted vehicle interior plastic add-on parts, known throughout the rest of this specification as the "Process". The purpose of these requirements is to ensure that the level of final finish and performance on interior painted plastic parts meets or exceeds the level expected by the vehicle owner. This standard applies to finished parts produced by GM Suppliers known throughout the rest of this specification as the "Part Supplier". Any deviations from this specification will need to be approved by a representative of the Part Supplier and GM's Bill of Material (BOM) Family Owner (BFO), Supplier Quality Engineer (SQE) and Purchasing Agent using the Deviation Request Form in Appendix A. The Part Supplier also is required to submit Deviation Request Form M7 found in Statement of Requirements (SOR). The Deviation Request Forms Appendix A and M7 need to be part of the SOR package and reviewed with GM at the Technical Review. A copy should also be part of the Approved Paint on Parts (APOPS) package.

1.2 Applicability. Painted vehicle interior plastic add-on parts.

1.3 Remarks. This specification is intended to reduce the risk that a Part Supplier may have in producing painted parts that meet GM's requirements. Emphasis is placed on the ability to supply a uniform and consistent part. While this specification details the requirements for global qualification, additional information and/or qualification may be requested by GM regional SQE representatives. Additional data required to be submitted will be determined by the regional SQE representatives. Addressed in this specification are the following:

- APOPS.
- Part Cleaning.
- Paint Processing.
- Film Build Requirements.
- Bake Requirements.
- Appearance Requirements.
- GMW14797 Performance Testing.

1.4 Requirement Wording Conventions. Within this specification the following conventions are applied:

- The word "shall" states a binding requirement which verifiable proof shall be provided to GM within 24 h upon request.
- The word "Should" denotes a preference or desired conformance.

2 References

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

2.1 External Standards/Specifications.

AIAG FMEA-4 AIAG PPAP-4 ISO 2808

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2.2 GM Standards/Specifications.

9984801	GMW14270	GMW16133	GMW17205
GMW3059	GMW14797	GMW17138	GMW17434

2.3 Additional References.

- Deviation Request Form M7 found in Statement of Requirements (SOR).
- Dimensional Control Systems (DCS) File Log from Unigraphics (UG).
- GM 1927 16b – available through GM Supply Power.
- GM Global Customer Audit (GCA) at the GM Assembly Plant.
- Paint Supplier Technical Data Sheet.
- Process Control Plan.
- Signed Off Bake Chart.
- Statement of Requirements (SOR).

3 Requirements

3.1 Approved Material and APOPS. The Molder and Part Supplier shall select substrate and paint materials that are in the GM Materials Approved Source List per the material callouts that are in the Statement of Requirements (SOR) and Dimensional Control Systems (DCS) File Log in the Unigraphics (UG) Math Data.

Note: The appropriate GM Materials Engineering Department (Product Engineering or Manufacturing Engineering) must confirm all materials. Only materials/sources listed in the GM Materials Approved Source List have been qualified by GM Engineering as meeting GM requirements. Engineering qualifications of an approved source are required. To access this list, reference GMW14270 for latest location.

The Molder and Part Supplier shall follow the procedure in GMW14797 to obtain APOPS approval. APOPS is intended as a detailed review of a new combination of substrate/molding process/paint/paint process for a specific molder/painter. This is accomplished by the GM Materials Engineer with the Parts Supplier. An APOPS approval is documented with either:

a. Entry into the GM Materials Approved Source List.

b. Approval document from GM to the Parts Supplier.

3.2 Part Cleaning. Prior to painting, the parts shall be cleaned to remove various contaminants (dirt, oils etc.) that could potentially impact final finish and performance.

3.2.1 Cleaning Methods. A well-documented and followed solvent wiping procedure will need to be reviewed by the appropriate SQE. This will include verifying that the solvent used can remove all contaminants and is compatible with all paint and substrate materials.

3.2.2 Power Wash. If parts are to be painted with a basecoat/clearcoat topcoat system then power wash to 9984801 specification is the preferred cleaning method. The 9984801 specification defines contact times, pressures, concentrations of chemical cleaner and rinse aid, conductivity, temperature, pH, and flow rates. Chemical cleaners and optional rinse aids approved in the GM Materials Approved Source List to 9984801 shall be used.

3.3 Paint Process. The Part Supplier shall outline a detailed Bill of Process (BOP) which shows the specific plant flow diagram for each GM part style. The template is available in GM1927 16b audit file. See Figure 1 for an example of a Paint BOP.

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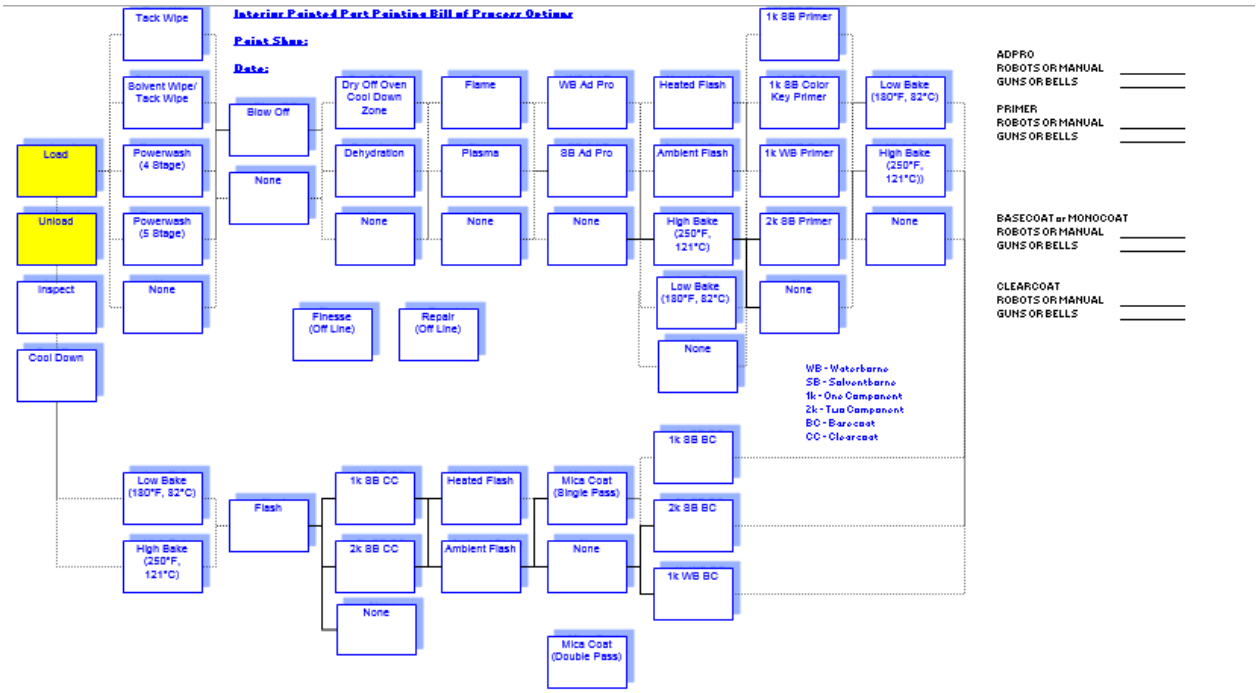

Figure 1: Paint BOP Example

3.3.1 Paint Application. For Instrument Panels (IP) and door panels the paint process shall consist of a paint line with a conveyor and paint application that is fully automatic. Adhesion Promoter (AdPro) application for any Thermoplastic Olefin (TPO) and Polypropylene (PP) substrates should be fully automated.

Note: Automation shall be capable of continuous application of approved materials at adequate fluid deliveries for consistent film builds that allow for durability, appearance and color harmony. Flow rates shall be verified at least once per week and flow meters (or gear pumps) shall be placed on a calibration schedule of at least once per year.

3.3.2 Proportional Mixers for 2K Paints. The preferred Process should use automated proportional mixes for 2K paints.

Note: “Hot potting”, i.e., when isocyanate and resin are premixed in a container, should be avoided where possible.

3.3.3 Booth Humidity and Temperature Influence. In regions where there are large changes in temperature and humidity the Parts Supplier will need to capture in the Process Control Plan how the plant will adapt for these changes (booth controls and/or solvent package changes to the paint).

3.3.4 Substrate Specific. Some substrates will have special requirements for paint, e.g., TPO and PP. In order to promote paint adhesion, the Part Supplier shall be able to add the correct AdPro, per the applicable GM material specifications, or to Flame Treat per GMW16133. Other substrate specific requirements may need to be considered per the DCS File log and SOR.

3.3.4.1 TPO and PP Specific. The Part Supplier needs to have a proven system that will prevent any rack of parts being painted in subsequent booths if it had a position or flow fault while painting the AdPro or did not get the proper flame treatment.

3.3.5 Paint Rack Validation and Inspection. The Part Supplier shall ensure that the Paint Racks/Castings are validated when built. The Part Supplier also shall inspect that the racks are not damaged after cleaning and/or storage.

3.3.6 Flash Times. The Part Supplier will ensure that they have adequate flash times.

Flash times are to be such that the part meets all performance requirements to GMW14797 and all appearance requirements.

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