

Early Production Containment (EPC)

1.0 SCOPE:

Early Production Containment (EPC) is to be used for all pre-production, production, service and accessory part requirements that:

- Require Production Part Approval Process (PPAP)
- Represent significant risk to the customer facility as mandated by GM

2.0 DEFINITION AND PURPOSE:

Early Production Containment requires a Pre-Launch Control Plan as part of PPAP submission that is a significant enhancement to the supplier's production control plan and raises the confidence level to ensure that all products shipped will meet GM's requirements. The pre-launch control plan will also serve to validate the production control plan. The Pre-Launch Control Plan should take into consideration all known critical conditions of the part as well as potential areas of concern identified during PPAP.

The purpose of EPC is to:

- Validate the supplier's production control plan
- Protect GM assembly and manufacturing centers and service part warehouses from quality non-conformances during critical periods including Launch.
- Document the supplier's efforts to verify control of its processes during start-up, acceleration, after revisions to the manufacturing process, or when manufacturing runs are shut down for extended period of downtime, critical engineering change or if supplier is providing new product during Launch.
- Ensure that any quality issues that may arise are quickly identified, contained, and corrected at the supplier's location
- Increase involvement and visibility of supplier's top management

3.0 SUPPLIER RESPONSIBILITY: The supplier shall:

A. Validation Process: Establish a validation process that contains the following elements:

1. Identify the staff person responsible for ensuring the development and implementation of the verification process.
2. Implement EPC with entry date, exit criteria, and exit date as defined by the customer
3. Establish EPC containment stations, which must be off-line, separate, and independent check from the normal manufacturing process and located at end of process. Additional, or when more effective, in process containment stations may be utilized and must be documented and approved by the customer/Supplier Quality Engineer (SQE).
4. Review PFMEA to identify additional inspections, testing, and dimensional checks required at the EPC containment station based on Key Product Characteristics (KPCs), Part Quality Characteristics (PQCs), critical measurement points, high RPN and/or issues identified during product and process development. EPC plan shall also include labeling.
5. Previous Quality and labeling SPPS records, Lessons Learned and internal failures, PRTS and any validation build learnings shall be incorporated in the Early Production Containment plan.
6. Train personnel relative to the standardized work performed at the EPC containment stations.
7. Establish a reaction plan for single defect. EPC shall be treated as customer. There shall be no rework conducted at EPC.
8. Implement an audit process of the EPC containment utilizing levels of management (layered audit), including site leadership, to insure conformance to the Pre-Launch Control Plan.
9. Include subcontractor (Tier 2) in the validation process.
10. Submit data to GM for all KPC's, PQC's, and critical measurement points per the requirements defined in GMW 15745.

B. Plan Development: Development of a Pre-Launch Control Plan which is a significant enhancement to the production control plan and consisting of additional controls, inspections, audits, and testing to insure conformance and capability of the manufacturing process. Pre-Launch Control plan shall be a separate document to regular production PCP.

The plan needs to consider:

1. Increased frequency/sample size as stated in the Production Control Plan.
2. Shall be Redundant 100% checks unless approved by Customer/SQE to lot sampling
3. Tier 2 pass-thru features that interfaces with customer shall be 100% checked
4. Verification of packaging and label requirements – including service and accessory part requirements, which may include country of origin labels on parts.
5. Verification of the effectiveness of error proofing.
6. Immediate implementation of containment and irreversible corrective action when non-conformances are discovered in the EPC containment area or at the receiving location.

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All elements of GM 1927 28 apply to sub-tiers as they do to Tier 1 suppliers per CG4355 GM1927 03 Sub Tier Supplier Management Statement of Requirements. GM supplier quality engineers may request and participate in GM 1927 28 audits of select sub-tier suppliers based on risk.

- Note: Failure to implement EPC by required timing could result in SPPS and Controlled Shipping per GM 1927 17 Supplier Quality Processes and Measurements Procedure

C. Documentation: Document the Pre-Launch Control Plan using the Control Plan format referenced in the AIAG Advanced Product Quality Planning and Control Plan Reference Manual or other customer approved Advanced Quality Planning reference manuals. The Pre-Launch Control Plan is not a substitute for the Production Control Plan but, is an addition to the Production Control Plan and is used to validate it.

1. Document additional inspections, functional testing, and dimensional checks required at the EPC containment station or in process check stations on the Control Plan Special Characteristics form referenced in the AIAG APQP Manual – Supplement K and reference said document in the Pre-launch Control Plan as a specific operation.
2. Document inspection work instruction for the EPC containment station to insure standardized work.
3. Document evidence of execution and validation of the control plan utilizing the I-chart (GM 1927 66) or another format agreed upon by the customer. The data must be readily available for review by the customer/SQE.
4. Document problem solving for both internal and customer quality concerns utilizing customer acceptable format; including problem description, root cause, irreversible corrective action with break points and update FMEAS and Control Plans as appropriate. The 3 x 5 Why Analysis (GM 1927 84) for root cause and Read Across (GM 1927 69) to apply lessons learned are to be utilized.
5. Pre-Launch Control Plan to be uploaded into SQMS as part of NS PPAP in Process Documentation element along with production control plan. Once EPC exit is approved, process will change to production control plan.
6. **Early Production Containment Audit:** Conduct GM 1927 33: Early Production Containment Audit to verify effectiveness of EPC. Issues found during the audits shall be resolved prior to NS PPAP approval. Audit results to be uploaded to the SQMS Customer Specific Requirements tab starting at NS PPAP approval.

D. Quality System implementation at EPC station

1. EPC area shall be separated from main production process. Large label indicating Early Production Containment area and foot printed, scrap containers and part flow shall be clearly identified. Any deviations require SQE approval.
2. Flow of material through Early Production Containment, and material status shall be clearly identified
3. All tools and gauges in EPC shall be calibrated and are to the latest engineering change level and gauge instructions are available at gauge station.
4. Operator instructions are firmly attached and visible to operator. Instructions are to the latest engineering change level. Verify reaction plan is included for discrepant parts found.
5. Standardized Worksheets available in-station and operators are trained effectively to follow the standardized work
6. Boundary samples/master samples are available at EPC Station to as indicated in work instruction
7. Work in Process protection at supplier have adequate protection to protect parts from damage until packed and on carrier. For Material handling for the entire process, parts are protected from damage and necessary checks in place in EPC.
8. All parts exiting Early Production Containment have the identification per Pre-Launch Control plan and controls in place to ensure only approved material leaves Early Production Containment area.
9. Robust process shall be in place to prevent shipment of material that has not gone through Early Production Containment.
10. Process for documenting and tracking Early Production Containment Problem Reports shall be in place.
 - a. I charts, Corrective Action Reports exist for each issue identified in Early Production Containment.
 - b. process to verify all steps from immediate containment through to irreversible corrective action.
11. Leadership to ensure that discrepancies from Early Production Containment area are managed as priority areas for process improvement.
 - a. Early Production Containment issues are reviewed at the daily management meeting.
12. If more than one shift, part problem information shall be passed across shifts.
 - a. shift log/notes, closed loop on shift problems.
 - b. Update information board with training records, I-chart, layered audit plan/results, quality emerging issues / high focus areas
13. Early Production Containment concerns are tracked back to the PCP and PFMEA
14. Plan for Layered Audits by plant leadership to verify Early Production Containment execution

E. Duration of EPC:

During Launch Phase, EPC shall be implemented at start of first GM plant assembly builds that requires PPAP status. Normally, 1st builds will be APPV builds that requires NS PPAP. EPC shall remain in place until 90 calendar days after SORP to confirm production control plan has been validated.

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EPC inspection is mandatory for 100% of all parts required through the EPC period. Based on documented acceptable performance, which includes no issues identified at EPC or by the customer, the customer/SQE may approve a reduction of the 100% inspection requirements or reduction in duration after by the customer. This must be documented and approved by the customer/SQE.

During Production phase, requirement for conduct EPC and duration due to extended down time or/and critical engineering change shall be discussed and agreed with GM SQE.

E. Identification: To indicate compliance with the EPC requirements, attach to each shipping label a green circular, sticker, approximately 25mm in diameter, signed by the staff person accountable to insure proper implementation of.

G. For parts with an applicable Part Specific Early Production Containment SOR (or CG), the supplier shall comply with any additional requirements.

4.0 EXIT CRITERIA:

Supplier will be eligible to exit EPC after validating the effectiveness of Process Control Plan and meeting the criteria listed below. If the supplier is unable to meet the exit criteria or the supplier's EPC plan continues to identify non-conformances the supplier shall continue the necessary containment measures to insulate the customer until the quality concerns have been resolved to the satisfaction of both the supplier and the customer and the supplier's Production Control Plan is validated. Supplier shall use GM 1927 39, EPC exit request letter to request exit of EPC.

- Ship the number of pieces required to meet production requirements as specified by the customer for the EPC period with no problems identified in EPC or by the customer.
- If a problem is identified in EPC or by the customer, EPC must remain in effect for a minimum of 2 weeks after implementation of permanent corrective action after original EPC period.
- If the EPC plan continues to identify non-conformances, the EPC plan must be kept in place until process controls and capabilities have proven effective and the Production Control Plan is validated.

4.1 VERIFICATION FOR EXIT

- Supplier to request exit from when eligible and provide supporting documentation and assessments on performance and corrective actions, if applicable, to the appropriate Customer representative.
- Customer to verify that the supplier has met exit criteria. Decision to exit shall only be based on objective evidence.
- Customer to notify the supplier whether they have met the criteria and are removed from EPC by documenting in EPC exit letter (GM 1927 39). Approved EPC exit letter to be uploaded to Customer Specific Element in SQMS.

5.0 CONSEQUENCES OF SHIPPING NONCONFORMING MATERIAL:

- If a Quality and/or Labeling Supplier Practical Problem Solving (SPPS) record is issued for a feature not covered on EPC, then the feature must be added to EPC.
- Criteria for application of Control Shipping - Level 1 or 2 shall follow the procedure in GM 1927 17 Supplier Quality Processes and Measurements Procedure 7.3.2.

Reference:

- GM 1927: Supplier Quality Manual Task 14
- CG4355 GM 1927 03 Sub Tier Supplier Management Statement of Requirements
- GM 1927 19 PPAP Checklist
- GM 1927 33 Early Containment Audit
- GM 1927 39: Early Containment Exit Letter
- GM 1927 11: APQP Kickoff and SRV Worksheet
- GM 1927 17 Supplier Quality Processes and Measurements Procedure

Revision History

Section Number	Rev. NO	Section Description	Change	Date

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4.1	1.0	Verification for Exit	Added optional Exit Letter	June 2012
5.00	2.0	CONSEQUENCES OF SHIPPING NONCONFORMING MATERIAL	Replaced PRR with "Supplier Practical Problem Solving (SPPS) record" (Lidia Natanail	March 2019
2.00	3.0	Definition and purpose	Added requirement to Pre-Launch Control plan as part of PPAP submission. Added EPC could be implemented during Production for extended down period or for critical engineering changes	June 2020
3.0 A	3.0	Supplier Responsibility - Validating Process	Clarified inputs to use to create EPC items such as using PFMEA, SPPS, Lessons Learned, PRTS or validation build learnings. Documented/Clarified that no rework is allowed at EPC	June 2020
3.0 B	3.0	Supplier Responsibility - Plan Development	Clarified/Added 1: Pre-Launch PCP as separate document to PPAP 2: Tier 2 customer interface shall be added to EPC list, 3: GM1927 28 applies to all sub-tier suppliers per CG4355 4: Added a note that failure to implement EPC could results in SPPS or CS per GM1927 17	June 2020
3.0 C	3.0	Supplier Responsibility - Documentation	Clarified requirement for data gathering using I chart of similar. Added new requirement to upload Pre-Launch PCP in SQMS Added new requirement to conduct EPC Audit (GM1927 33) as standard process and upload to SQMS prior to NS PPAP	June 2020
3.0 D	3.0	Supplier Responsibility - Quality system implementation at EPC	Added new section to clarify items required at EPC station	June 2020
3.0 E	3.0	Supplier Responsibility - Duration	Updated "through acceleration or 2 weeks" to "from first GM plant builds that require NS PPAP to 90 Days after SORP"	June 2020
3.0 G	3.0	Supplier Responsibility - Part Specific EPC	Added G, for parts with part specific EPC requirements that are specific to commodities	June 2020
4.0	3.0	Exit Criteria	Updated new requirement to use GM 1927 39 EPC exit letter as standard process and uploading into SQMS	June 2020
5.0	3.0	Consequences of Shipping Non-Conforming Material	Added labeling to Quality SPPS type Updated requirement to reference GM1927 17 for consideration of Controlled shipping	June 2020
Reference	3.0	Reference	Added additional reference documents	June 2020