

# PROCESS AND EQUIPMENT VERIFICATION

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## Process and Equipment Verification

### I. Applicable Documents

- A. AIAG PPAP Manual
- B. AIAG SPC Manual
- C. CORP-01-04-00-00 Classification of Characteristics
- D. CORP-03-15-01-00 Process Capability
- E. CORP-06-05-00-00 Measurement System Analyses
- F. CME-03-0095 General Procedures
- G. CME-03-0100 Equipment Maintainability and Reliability
- H. CME-15-0231 True Position Capability
- I. ISO-22514-3 - Machine performance studies for measured data on discrete parts

### II. Definitions

- A. AIAG (Automotive Industry Action Group) – A joint committee which creates common standards and processes for suppliers to the automotive industry.
- B. Catalog item or standard product un-tooled machines – Machines and other items which the supplier will not make any modifications to and the supplier is not providing any fixturing, tooling or processing hardware.
- C. CME (Central Manufacturing Engineering) – Internal manufacturing standards created by Atmus.
- D. AMES (Atmus Manufacturing Execution System) – An IT system developed by Atmus to monitor, control and streamline shop floor manufacturing operations (people, machine, material and information) for manufacturing excellence.
- E. CNC (Computer Numerical Control) – A machine where the motions are created and controlled by a computer-based machine controller.
- F. CORP (Corporate) – Internal Atmus Corporate standards.
- G. Dry run – Occurs when a machine is cycled but NO value-added manufacturing occurs.
- H. Engineered cycle time – Theoretical cycle time of the equipment based on the engineering design.

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- I. Key characteristic – A dimension, material property, physical feature, process, etc. that has been identified as being key to subsequent manufacturing or assembly operations. Key characteristics apply predominantly to minor characteristics.
- J. Long Term Capability Study – A study conducted over an extended period of time which includes potential sources of variation such as tool changes, multiple operators, environmental change and incoming material variation. The minimum time to verify long term capability is a study of one month.
- K. LOTO (Lock Out Tag Out) – Specific practices and procedures to safeguard personnel from the unexpected energization or startup of machinery and equipment or the release of hazardous energy during service or maintenance activities.
- L. MSA (Measurement System Analyses) – A study performed on a measurement system to quantify its measurement variation or uncertainty.
- M. Operating parameters – Input variables which are key to determining the outputs of the manufacturing equipment and process. Examples include but are not limited to pressure, volume, flow rate, temperature, distance, time, etc.
- N. PPAP (Production Part Approval Process) – A process defined by AIAG which ensures the production process has the potential of providing product that meets the engineering design specifications.
- O. Product capability – Determines the ability of a manufacturing process to meet all engineering design record and specification requirements.
- P. SDS (Safety Data Sheet) – Documents material characteristics required to comply with safety regulations.
- Q. Significant Production Run – The manufacturing of production parts per the AIAG PPAP manual as a part of the PPAP process.
- R. Special Characteristics – Product characteristics or manufacturing process parameters which can affect safety or compliance with regulations, fit, function, performance or subsequent processing of product.

### **III. Introduction**

- A. The practice of Atmus is to ensure the function, performance, capability, maintainability and safety of all new and rebuilt production equipment and processes. This includes non-production equipment used directly in the support of manufacturing.
- B. This section defines the requirements of the supplier and Atmus in establishing individual project approval plans, setting forth general requirements and techniques and providing guidelines on verification limits and analyses.

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- C. The supplier shall fully support all three phases of acceptance. Time, resources and cost for verification on the supplier's floor plus initial and final acceptance at Atmus shall be included in the supplier's proposal.
- D. A multiple phase verification process will occur. The first two steps shall occur at the equipment system supplier facility. The supplier shall satisfy the defined verification requirements before a Atmus representative will travel for runoff acceptance trials. The supplier may be responsible for costs associated with travel, lodging, meals, and scrap parts if more than one runoff is required to qualify the machine and obtain satisfactory acceptance.
- E. Tier two and three equipment as identified by the project team shall be verified at the sub-supplier's site by the tier one supplier prior to shipping to the tier one supplier. The details shall be included as a part of the tier one equipment proposal to Atmus. Reference CME-03-0095 General Procedures for system integration requirements.
- F. It is Atmus' intent that the supplier will follow the applicable documents listed in section I for all verifications. In the event there is a conflict among the applicable documents, the Request for Proposal (RFP), and the instructions in this section, the verification requirements shall adhere to the strictest of these requirements unless written authorization is granted by the Atmus Project Manager.
- G. Equipment shall be verified for compliance to all conditions of purchase at the supplier's facility by the Atmus Project Manager. The final verification of all purchased elements shall be made after installation at the Atmus facility.
- H. A key part of the verification process is the completion of the section checklists, which are a part of every section of the Atmus Production Specifications. Verified completion of all applicable section checklists is required before approval at the supplier facility and final approval at Atmus. Contact the Atmus Project Manager for the checklists.

#### **IV. General Verification Requirements for all Phases**

- A. The following elements apply to all phases of the verification process, both at the supplier and at Atmus:
  - 1. Acceptance shall follow the terms, conditions and process listed in CME-03-0095 General Procedures.
  - 2. A verification plan as described in the Request for Proposal shall be used. The verification plan shall be documented and agreed to before issuing the purchase order for the equipment.
  - 3. Process and equipment shall be properly tooled and adjusted to the contracted equipment specifications before verification studies are conducted.

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4. A formal gauging plan, in writing, shall be agreed to between the equipment supplier and the Atmus Project Manager. Where possible, the gauges selected should be the same gauges planned for production.
5. A Measurement Systems Analysis (MSA) study in accordance with the CORP-06-05-00-00 MSA Procedure shall be completed for each gauge, including CMM programs, prior to its use. Any measurement system where the results of the MSA uncertainty is greater than 20 percent of the part tolerance shall be reviewed and approved by the Atmus Project Manager.
6. Part condition must be acceptable for the intended runoff. Deviation from part print and process specification shall be documented and approved by the Atmus Project Manager.
7. Process and equipment shall comply with all specifications required in the purchase order including, but not limited to, safety, noise emissions, hazardous materials, coolant, hydraulics, pneumatics, lubrication, mechanical, automation, electrical controls, cycle time, etc.
8. Process and equipment shall be operated as though it is in production including, but not limited to, safeguarding, operating speeds, feeds, coolants, piece-to-piece cycle time, etc. All equipment parameters shall be at operating temperature before the verification studies are conducted.
9. Formal verifications shall be performed in the presence of the Atmus Project Manager, or their delegate, and other appropriate Atmus personnel.
10. Any deviations from these conditions must be approved by the Atmus Project Manager.

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