Production Part Approval Process (PPAP) for suppliers

Document Control Block

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Abbreviations and Definitions

For General Appareo Terms and Definitions see: General Nomenclature and Definitions document (606529-000012)
List all Abbreviations and Definitions that apply in alphabetical order.

Abbreviation	Term	Definition
PPAP	Production Part Approval Process	Process defined by the AIAG to approve parts for being used production.
AIAG	Automotive Industry Action Group	Non-profit organization, supported by the automotive industry and dedicated to create standards.
FAIR	First Article Inspection Report	Also known as AS9102 (Aerospace Standard 9102) Form used in the Aerospace Industry to approve parts for being used in production.
PSW	Part Submission Warrant	Also known as Warrant, form used in the Automotive Industry (endorsed by AIAG) to approve parts for being used in production.
---	Special Process	Special process refers to those that cannot be visually inspected and tested without destruction. Examples are welding, plating, adhesion, soldering, etc.
<KC>	Key characteristic	Characteristic defined by Design or Manufacturing for being critical for the product, which requires additional validation studies or special process control.

Table 1

Documents and Forms Referenced

All Documents referenced in this document can be located using the Document Control policies and Process Manual (606521-000002) ref. Quality Manual for location. List all Documents and Forms Referenced in numeric order.

Doc. #	Title

Table 2

1 PURPOSE

The purpose of this document is to delineate the steps used to approve a part for production in accordance to the PPAP standard defined by the AIAG, and tailored for Appareo Systems to include the First Article Inspection Report defined by AS9102 for Aeronautical products.

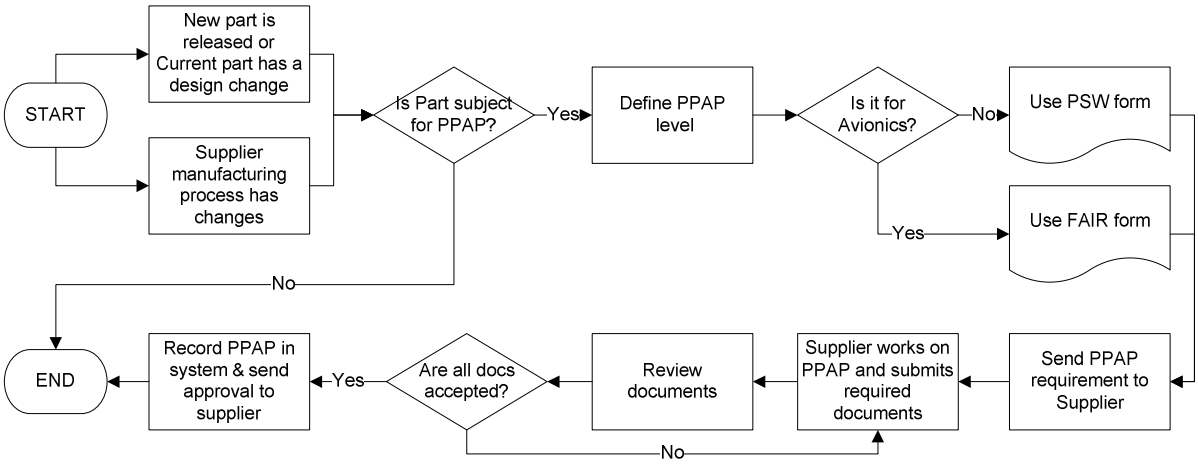
2 SCOPE

This procedure defines when a part from a supplier is subjected to PPAP and sets the requirements to approve such part for production, for both Aviation and other industries that Appareo Systems is supplying. Prototype parts may be subjected to PPAP.

3 OBJECTIVES

The objective of this procedure is ensure the proper approval of supplied parts to be used on production.

4 PROCESS FLOWCHART



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5 RESPONSIBILITIES

Quality Engineering and, when required, applicable Design Engineer are responsible to define if a part is subjected to PPAP and what is the level required for documentation. Quality Engineering are responsible for the revision of documents and approval of the PPAP. A Quality representative can send PPAP to supplier and follow up for the delivery of approved documents.

6 PROCESS/PROCEDURE

6.1 Every time a new component is released, experiences a design modification/revision or the supplier manufacturing process is changed, the part is subjected for evaluation to determine whether or not a PPAP is required.

Appareo Systems is responsible to inform the supplier about any design change made to the component, and Supplier is responsible to inform Appareo Systems about any change in the design of the component or in the manufacturing process. Both sources trigger an evaluation to determine the need of PPAP.

6.2 PPAP may be required as determined by Appareo in the following conditions:

- New/modified/revised component is custom.
- Current custom component experiences a change in design that affects fit, form or function.
- Supplier manufacturing process has significant changes or it is relocated to a different site/sub-tier supplier; or an identified special process has a change at supplier or sub-tier supplier.
- Custom component has an error in any document and needs to be corrected.

6.3 Quality Engineering and, when required, the applicable Design Engineer determine the level of the PPAP based on the type of change in the component or in the process being affected. Per Appareo's needs levels 2 & 3 defined by AIAG are covered by Level 4.

PPAP levels:

- Level 1: Only PSW, plus Appearance Approval report
- Level 4: PSW or FAIR, plus requirements defined by Appareo Systems
- Level 5: PSW or FAIR, along with product samples, and complete support information available for review at supplier's site.

Supplier is responsible to submit the required documents, but also responsible to retain the rest of the not requested relevant documents and have them available for Appareo Systems upon request, some exceptions may apply when documents are not required by the nature or specifications of the component.

PPAP requirements are defined by the following documents:

- **Design records**, including details of the component like drawings, CAD/CAM models, specifications, etc.
- **Engineering Change Orders** related to the component and/or change in question.
- **Engineering approval**, if specified by Design records, as evidence of customer engineering approval.
- **Design Failure Mode and Effect Analysis (DFMEA**), when supplier owns the design and should include requirements set by Appareo Systems.
- **Process Flow Diagrams** to describe Supplier's manufacturing process in steps and sequence, special processes should be clearly identified in the diagram.
- **Process and Failure Mode and Effect Analysis (PFMEA)** to demonstrate that supplier is considering and controlling failure modes required by the product, including special processes, to meet requirements set by Appareo Systems. Generic PFMEA for a family of products is accepted only when they have the same manufacturing process and failure modes.

- **Dimensional Results**, evidence of measured piece that demonstrate is meeting drawings and specifications defined by Appareo Systems. Supplier shall have dimensional reports for all unique manufacturing process and all molds, cavities, dies, etc.
- **Material Test results**, required by design or control plan like chemical, physical, metallurgical, etc.
- **Performance Test results,** performance or functional requirements required by Design or Control Plan.
- **Initial Process studies,** including capability studies for key characteristics <KC> specified in design records and special processes, where Cpk should equal or greater than 1.33. In case that <KC> cannot be measured, Design and Quality Engineering will define the best analysis to confirm <KC> or/and special process are being met.
- **Measurement System Analysis studies**, like Gage R&R are required for key characteristics <KC> specified in design records. In case that <KC> cannot be evaluated, Design and Quality Engineering will define the best analysis to confirm <KC> is being properly evaluated by the equipment.
- **Material Certification report**, evidence that material meets requirements defined in design records.
- **Control plan** to demonstrate that manufacturing process is monitoring failure modes and controlling normal and key characteristics, plus special processes. Control plan must be presented in the sequence of the process flow, and a generic Control Plan for a family of products is accepted only when they have the same process controls.
- **Part Submission Warrant (PSW) or First Article Inspection Report (FAIR)** form is utilized to summarize and approve the documents issued to evaluate the part, where FAIR is used for components assembled in Aeronautical products and PSW is used for the rest of the components.
- **Appearance Approval Report,** to demonstrate that component is meeting requirements like color, grain size, or surface finish, etc.
- **Master sample,** sample taken from initial run and retain by the supplier for any further customer request. There should be a master sample per unique manufacturing process or per mold, die, cavity used for making the same product.
- **Customer Specific requirements,** Appareo may request additional requirements not represented by any of the requirements stated above.

6.4 Once PPAP level and required documents are defined, a Quality representative sends the PPAP requirement to supplier via email, along with the following information:

- Part number and revision
- Reason for change
- PPAP level and required documents to submit to Appareo Systems
- Expected date for delivery
- Contact to submit information or request support (name and email address)

6.5 Supplier is responsible to run the parts for PPAP, evaluate them and analyze/collect all the required information, and put them in the proper PPAP forms***,** electronic signatures are accepted; Supplier should respect the expected delivery date; and in case of cannot meet required date, they should advise Appareo Systems of the date they can meet immediately for review and approval by Appareo. Supplier is not allowed to ship production parts without previously obtaining approval from Appareo.

***** Suppliers can use any form stated in this procedure that meets criteria defined by the AIAG and AS9102.

6.6 Quality Engineering is responsible to review the PPAP documents submitted by the supplier and ensure that information in documents meet the expected requirements for the component, if all requirements are accepted the reviewer can proceed to approve the PPAP; if not, the reviewer or Quality contact should advise the supplier about the finding to correct/clarify information or to re-evaluate the component, once the issue is corrected or clarified the reviewer can approve the PPAP.

In case that a component does not meet any of the requirements, Quality Engineering should contact the applicable Design Engineer, and if needed, the Supply Base Manager to define how to proceed based on the type of requirement not being met:

- Giving a conditional approval to allow the supplier to ship, this approval is finite and should come with a plan to correct the issue.
- Not giving approval to ship, and supporting the supplier to make the required changes to meet the specification.

6.7 Quality Engineering signs off, manually or electronically, the PSW or FAIR (for definitive or conditional approval), and the Quality contact responds to the supplier with such form and authorizing the shipment of the component. If the component is not approved, the Quality contact advises the resolution and reason for not approving, the supplier is not able to ship components until the issue is solved and approval is given.

6.8 Records for PPAP documents requested to the supplier, along with the approved PSW/FAIR and Email with PPAP request should be stored in the next link:

Z:\Departments\Product Development\PPAPs

Records should be retained for the active life of the component plus five years calendar.

7 RECORD OF REVISION

Record of Revision			
Revision Number	**Change Description**	**Revision Date**	**Inserted By**
0.2	Preliminary Development	11/10/2017	*Victor Gallegos*
1.0	Initial revision	11/14/2017	*Victor Gallegos*