PRODUCTION PART APPROVAL PROCESS (PPAP)

1. Purpose and Scope

To define the Production Part Approval Process (PPAP) requirements for X-Rite's suppliers. This applies to all commodities and its packaging new to X-Rite Inc., as well as those affected by design, material, or process changes as described below.

2. Requirements

Production part approval shall conform to all requirements as defined in the Automotive Industry Action Group's (AIAG) Production Part Approval Process – PPAP manual (unless specified herein).

A level 3 submission shall be observed for all submissions unless otherwise noted on the Purchase Order or formally conveyed in writing. Substance of Concern (SOC) according to Hazardous Chemical Reporting Requirement MSDS 40 CFR Part 370 information is required if applicable. MSDS must be submitted as part of PPAP regardless of PPAP submission level in regards to SOC.

In addition, supplier must provide, as part of the PPAP, a substance declaration in accordance with the X-Rite Global Product and Component Specification for the Environment (GPCSE) in order for a supplier PPAP to be considered for approval.

No production parts are to ship without PPAP approval (warrant approved by X-Rite and supplier is in receipt of the X-Rite representative signed warrant).

All X-Rite suppliers are required to obtain production part approval (PPAP) **prior** to the first production shipment of any commodity for reasons as defined by the AIAG PPAP standard, latest revision. Examples include, but are not limited to:

- A new part or product.
- A part number revision change.
- Any change that requires a revision of the Process Control Plan.
- Correction of a discrepancy on a previously submitted part.
- Product modified by an engineering change to customer specifications, design records/ customer drawing, or materials.
- Note: For certain non-custom designed components, the purchase order will dictate PPAP requirements.

Additionally, X-Rite Inc. must be informed in writing of any changes (as defined by the AIAG PPAP standard, latest revision) prior to their implementation. These activities will require PPAP approval **prior** to the shipment of production parts, unless otherwise indicated in writing by X-Rite. X-Rite Purchasing will inform the supplier of the PPAP level required. (following the PPAP manual). Examples requiring submission beyond those included in the PPAP manual include:

- Each occurrence of, or permanent allowance for, salvage of parts that is not already formally defined and documented in the approved flow chart and control plan.
- Each occurrence of, or permanent allowance for, reworking, re-sequencing, or reprocessing of a part involving customer significant/critical characteristics that is not already formally defined and documented in the approved flow chart and control plan..
- Change in appearance not designated by any customer specification (e.g., paint dots, etc.).
- Add modify, or eliminate a machine monitor.
- Change in packaging.

- Change in inspection sample size or frequency, gauging method, or other customer approved Control Plan item or locked process.
- Following a customer request to suspend shipment due to a supplier quality concern.

In addition to the above circumstances, an annual review and re-PPAP may be required on certain commodities. If requested, a level 3 PPAP will be submitted, unless otherwise specified in writing by X-Rite Purchasing. The layout will include actual measurement results of all dimensions on the X-Rite drawing. In the case of multiple workstations, fixtures, mold cavities, etc., a layout will be required from product produced on each one.

Tooling: It is expected that the supplier will use only calibrated measuring instruments.

Documents: The following list of standard formats will be used as part of a PPAP submission for X-Rite:

- Part Submission Warrant – QAL-002
- Production Part Approval Dimensional Test Results – QAL-003
- Production Part Approval Material Test Results – QAL-004
- Production Part Approval Performance Test Results – QAL-005
- Appearance Approval Report – QAL-006

3. Submission

The Supplier is responsible for submitting a Part Submission Warrant (PSW) to the required level, with supporting PPAP documentation, for all new and existing commodities as defined in the conditions in the "Requirements" section of this document. Periodic reviews of APQP (Advanced Product Quality Planning) status and progress (including, but not limited to documentation, tooling progress, design reviews, build schedules) may be required throughout the APQP process prior to actual PPAP submission. All documentation (progress reports, dimensional results, PPAP documentation packages, etc.) must be submitted directly to X-Rite Purchasing. **DO NOT** submit documentation by placing it in containers with parts.

All PPAP documentation is to be submitted in English.

PPAP level 2, 3 & 5 submissions **must** include at a minimum:

- Warrant (Part Submission Warrant (PSW))
- Sample parts
- Ballooned drawing
- Inspection results supplied on the appropriate format as listed above in Section 2, “Documents.”
- Process Control Plan
- Material Certifications

The following should be included if available and may be required at a future date:

- Test data as required on drawings
- Gage R&R / Process Capability Study on all critical control characteristics (KCC/KPC)
- FMEA
- Process Flow Diagram

Level 1 and 4 submissions will be defined in the purchase agreement.

The Supplier is responsible for obtaining the latest revision of the PPAP standard from the AIAG. The supplier is responsible for knowing this standard and applying it as part of the approval process for all commodities.

MSDS Submission: Suppliers are to notify X-Rite Purchasing in writing in advance when a submission of Substance of Concern (SOC) is forthcoming. A copy of the print screen of the MSDS is acceptable for the submission package.

Dimensional Results: X-Rite suppliers shall submit dimensional results in a format as listed in section 2 "Documents" unless an alternate format is agreed to in writing by X-Rite Supplier Quality. This document will combine the AIAG requirements for Dimensional Results and Preliminary Process Capability Studies. A report on the control of special processes and a specific work instruction shall accompany the dimensional results when specified by X-Rite Supplier Quality. The Supplier will submit a total of 30 pieces (unless otherwise directed by X-Rite Supplier Quality) along with a 6 piece layout and a 30 piece capability study for all critical control characteristics (KCC/KPC) as identified on the X-Rite drawing.

Process Control Plan: A copy of the latest revision of the Process Control Plan shall be submitted to X-Rite as part of any initial or re-PPAP. X-Rite also reserves the right to request specific work instructions or any other document related to the Process Control Plan. In addition to containing controls for all in-house processes, the Process Control Plan must also include verification of the characteristics contained in any pass-through components.

Process Capability Studies: (if requested by X-rite Engineering) Process Capability Studies shall be submitted for identified characteristics (KCC/KPC) at or prior to PPAP submission. Results shall be submitted in a format as mutually agreed upon by the supplier and X-Rite Engineering. Studies will be performed on KCC/KPCs shall be performed per AIAG guidelines unless otherwise agreed by X-Rite Engineering. An initial process study index value > 1.67 Ppk is required on these characteristics. Ongoing capability must be maintained at > 1.33 Cpk throughout program life, unless otherwise specified by X-Rite. In certain cases, a "Pp max." or "Pp min." may be acceptable, such as where tooling is targeted at one end of a tolerance range to allow for wear, or for a specified "min." or "max." tolerance. In addition to this requirement, capability studies may be requested on any other identified characteristic, either for PPAP or at anytime thereafter. Capability on all characteristics is expected throughout the life of the program.

Labeling: All shipments for PPAP must be clearly marked with the words "PPAP Samples" on the exterior of the container/box. Further all level 2, 3 & 5 PPAP submissions must include on the exterior of the container/box:

- X-Rite part number
- Engineering Revision Level
- Lot Number
- Supplier Name
- Supplier code (If applicable)
- Part Name
- Quantity

Report on Special Process Controls: Reports on special processes may be required for operations including, but not limited to, heat treating, welding, painting, or plating. This requirement is only applicable upon specific request by X-Rite.

Numbering Samples: All parts used in the process of dimensional evaluations shall be numbered in accordance to their recorded results and submitted to X-Rite.

Master Samples: In addition to master samples retained by the Supplier, the Supplier is responsible for supplying master samples to X-Rite, Inc. for retention at X-Rite (unless otherwise agreed upon in writing by X-Rite Purchasing). The Supplier shall submit master samples for each position of a multiple cavity die, mold, tool or pattern, or production process unless otherwise specified in writing by X-Rite Purchasing.

Master samples should be selected from the parts measured for the dimensional report at PPAP and numbered to correspond with the data submitted.

4. X-rite Review and Approval

Upon receipt of PPAP documentation – Supplier Quality will collect the information and place it into a PPAP folder. The folder shall be routed to the appropriate X-Rite engineer for review of the PPAP documentation to determine if the submission is adequate. Generally, Manufacturing Engineering will approve "Form, Fit and Function" changes while Product Engineering will approve process changes. This review may prompt the need of clarification material/data from the supplier or of additional/specific inspection procedures and data to assess the product submitted. Once the submission is considered acceptable, the appropriate X-Rite Supplier Quality engineer will disposition the warrant and complete the Part Warrant Submission, including checking the appropriate status box: Approved, Rejected, or Other.

APPROVED: The appropriate engineer will return a copy (hard copy or electronic) of the signed original warrant to Purchasing for communication back to the supplier. The appropriate engineer will forward the PPAP folder along with original signed warrant and sample parts to Manufacturing Engineering to be logged and stored. If the sample part is small enough, it will be included in the file. Larger materials will be stored in a location identified by the ISIR database. Manufacturing Engineering shall make an entry in the ISIR database to show that it was approved and the location of the samples. **The Supplier is then cleared to begin production shipments in accordance with contractual obligations between the Supplier and X-Rite.**

REJECTED: The appropriate engineer will return PPAP folder including the original rejected warrant and the submitted parts to Purchasing. The appropriate engineer will include markups or comments to the supplier as to the reason for the rejection. The appropriate engineer will return a copy (hard copy or electronic) of the rejected warrant to Manufacturing Engineering. Manufacturing Engineering will make an entry in the ISIR database stating that the Part Warrant Submission was rejected. **The Supplier is NOT cleared to begin production shipments to X-Rite.**

OTHER: As outlined in the "other" section on the Part Warrant Submission. This could include a Deviation.

A Deviation shall be written if discrepant parts are to be accepted as-is. The Deviation is added to the PPAP folder. Deviations will typically require agreement between Product Engineering, Manufacturing and Purchasing. A Deviation will be treated as ACCEPT and will follow the ACCEPT process with the addition of any required steps, needs, expiration dates, action plans, etc. as outlined in the Deviation.

Interim Approval may be given if:

1. Data shows lack of statistical capability but meets fit, form, & function
2. Documentation submitted is in-complete, missing information, and or not capable (if deemed low risk).

Note: Interim Approvals will need to be completed and brought to Full Approved status within 60 days of initial submission.