1 PURPOSE & SCOPE

This document is a general clarification of the PPAP requirements for Husqvarna sites worldwide. The information and instructions in this document supersedes the same information in the HQAP.

2 DESCRIPTION

This document provides clarifications and instructions for the PPAP submissions to Husqvarna worldwide.

Explanations to most of the abbreviations and wordings are able to be found on the internet. Below are a few of the most common abbreviations listed for explanation:

PPAP	Production Part Approval Process
APQP	Advanced Product Quality Planning
HQAP	Husqvarna Quality Assurance Process
(P)FMEA	(Process) Failure Mode and Effect Analysis
1st tier supplier	The supplier delivering to Husqvarna
2nd tier supplier	The supplier delivering to 1st tier supplier
OEM	Original Equipment Manufacturer
Sub suppliers	General description of second tier or further suppliers.
Top level parts	The highest level part number in a BoM list
Special Characteristics	General word for an important design feature. The term “Special Characteristic” is never abbreviated as SC in this document. See the types below:
CC	Critical Characteristic
SC	Significant Characteristic
IC	Inspection Characteristic

3 Pre PPAP Samples

Husqvarna will request different kinds of samples during the development process. The most common sample types are; prototype-, design- and PPAP samples, in that very order.

Prototypes and design samples are part of the technical release process, which is parallel to the PPAP process. The major purpose of the design sample process is the technical release, but it can also strongly contribute to the process assurance.

To make a design sample contribute to the process assurance and make the approval process more efficient, it is very important that those samples are produced in intended serial production equipment and evaluated in the intended measurement equipment.

4 Supplier PPAP Submission Responsibilities

In general, PPAP submission responsibilities depends on supplier type and position in the supply chain. The most common cases are described below, if other cases, the PPAP responsibilities must be clarified by the responsible SQE:

- A 1st tier supplier is responsible to summarize all PPAP documentation of their own and from 2nd tier and further suppliers for included parts when applicable. A PPAP from a 1st tier supplier can be rejected if documentation from included parts from the 2nd tier supplier are rejected.
- Appointed sub suppliers and their PPAP responsibilities have to be handled case by case since the reason for being appointed and situation affect the responsibilities. The two most common reasons why Husqvarna appoint a supplier are:
  - The part exist.
  - The part require to be produced by a supplier with special skills.
- A trading company is considered to be a 1st tier supplier.
- OEM- and System suppliers are considered to be 1st tier suppliers and the responsibilities are the same.

5 When a PPAP is Required

A new PPAP must be submitted if a top level or a sub part is affected by any of the different cases stated by the “reason for submission” section described in the Husqvarna PSW. These cases are copied below:

- New part or product
- Resubmission of a rejected or interim PPAP
- Engineering change (geometric, non-geometric, material etc.)
- Tool changes (new, replaced, changed or refurbished tool)
- Production process change (at any tier supplier)
- Transfer of any part to different plant or supplier
- Due to quality performance reasons or when deemed necessary
- When requested (if the part has not been manufactured during the past twelve months)

Note: It is not allowed to make any production process changes that can affect the quality without submitting a PPAP for review.

6 General PPAP Requirements

The PPAP level and requirements are communicated in 2 different ways depending on the reason for submission:

- **Design;** an ECO (Engineering Change Order) will be send for new parts or running engineering changes.
- **Process change or quality performance reasons;** the requirements will be communicated by responsible SQE.

Below instructions and statements are applicable for all PPAP submissions:

1) The **Husqvarna Part Submission Warrant is mandatory to use.**
2) **Production Trial Run Template** is mandatory to use when applicable. All other PPAP documentation can be supplier specific.
3) **The PSW** must represent the top level part number and revision state even if the reason for submission is a sub part change.
4) **All documentation** have to be referenced to the part number it represents.
5) **Mandatory submission items** for a PPAP level are stated in the Husqvarna PSW by respective PPAP level checkbox.
6) **PPAP level 0 and 6**:
   a) **Level 0** is only used for tool reviews and approvals in North America.
   b) **Level 6** items are customized and communicated in connected ECO or email.
7) **Exemptions of submission items** are either stated in the ECO or clearly communicated in advance to the supplier by responsible SQE. Reasons for exemptions can be:
   - Low annual production volume
   - On shelf parts a.k.a. (also known as) catalogue parts
   - Standard parts (fasteners, washers etc.)
   - Assy and system parts with a complex B.o.M.
   - OEM products
8) **PPAP samples** must be:
   a) Produced by ordinary staff in intended serial production, tooling, machines and equipment.
   b) Verified by intended serial production gages and measurement equipment.
   c) Sampled from a production trial run when requested.
   d) Submitted on the top level part number. No additional separate sub part samples should be submitted unless specifically requested.
9) **A "Production Trial Run"** will be called for when required and the quantity will be stated in the PPAP call off. A production trial run is commonly called for in below cases:
   - A new part in a project
   - A major design or process change
   - A sub supplier change
   - Change of manufacturing location
   - Quality performance reasons
10) **Special characteristics** must be clearly marked or highlighted in:
   - (P)FMEA
   - Control Plan
   - Work- and Inspection instructions.

   In addition to this, applicable documentation obligations and archive time must also be clarified in the instructions.

11) **RoHS and RML** compliance have to be confirmed and submitted.
12) **REACH compliance** has to be confirmed and submitted when applicable.
13) **Nonconformities** have to be clearly highlighted and accounted for in a PPAP submission. If not, the PPAP is regarded to confirm to specifications and the supplier will be held responsible for consequences of unaccounted nonconformities.
14) **Corrective actions** to nonconformities have to be presented in the PPAP submission.
15) **An approved PPAP** always assume that all submitted parts are according to specifications if no nonconformities are shown or accounted for.

6.1 BoM List PPAP Requirements

Since the complexity and extent of a BoM list part number and its structure can vary considerably, the possibilities to set general requirements are strongly limited. A PPAP request for a BoM list part number will almost always require clarifications. These clarifications are communicated in either the connected ECO or by the responsible SQE. Below follow a few of the general requirements that are able to be set for BoM list parts:

Husqvarna engineered top- and sub parts (including supplier engineered parts with a Husqvarna drawing header) must be verified and accounted for according to following:

- **First tier part numbers:**
  - **Evaluation documentation** like dimensional and laboratory results, MSA, capability studies, material certificates etc. must be accounted for.
  - **Process assurance documentation** like process flow chart, (P)FMEA, control plan, and production trial run have to be provided for at least the top level part (or main part).
  - **RoHS and REACH** compliance documentation have to be provided on top level part number.
  - **Packaging instructions** have to be provided for the top level part number.
- **Second tier part numbers:**
  - **Evaluation documentation** have to be at least dimensional- and laboratory results, MSA and Cpk for special characteristics and RoHS compliance documentation. Sample sizes are the same as in section *PPAP Submission Items*.
  - **Husqvarna appointed supplier parts** have to be accounted for according to above bullet point. If the part exists, it is sufficient to refer to the existing Husqvarna PPAP approval.

Electric Components, top- and sub parts, will be settled case by case.

Non Husqvarna engineered parts will be settled case by case.

Standard parts, fasteners etc, must be verified by a PPAP level 2.

OEM- and System Products will be settled case by case.

Catalogue Parts, also known as “on shelf parts”, will be settled case by case. The minimum requirements are:

- PSW
- Drawing
- Samples
- Dimensional and laboratory results
- Verification of compliance to RoHS

6.2 PPAP Submission Items

Below follows an explanation to the submission items in the Husqvarna PSW:

Item	Explanation
PSW	**Husqvarna Part Submission Warrant** template is mandatory to use.
Drawings	**Husqvarna drawings** (including supplier drawings with a Husqvarna drawing header) must be attached.
Flow chart	**Process Flow Chart** of the main part.
(P)FMEA	**(Process) Failure Mode and Effect Analysis** of the main part. Highlight or mark Special Characteristics.
Control Plan	**Control Plan** of the main part. Highlight or mark Special Characteristics.
MSA Studies	**Measurement System Analysis** are required for: • SC and CC (Significant- and Critical Characteristics) • When applying for an approval of a significant change of serial production measurement equipment for ANY characteristic. • If SC or CC is placed by an electrical characteristic, the requirements will be communicated by the responsible SQE.
Capability Studies	**C_{pk} or C_p charts** are required for SCs' and CCs' where at least 30 pcs (per cavity when applicable) have to be evaluated by MSA approved measurement equipment. One of below requirements have to be met: • **C_{pk}>1,33** for two sided tolerances. • **C_p>2,0** for one sided tolerances or when life cycle optimization is considered in tool design. • If SC or CC is placed by an electrical characteristic, the requirements will be communicated by the responsible SQE.
Samples	**Sample quantity** is communicated in the connected ECO and/or the PPAP call off. The general requirement for quantities are the following: • General quantity: 5 pcs measured and tagged + 20 pcs • Multiple cavities: 3 pcs measured and tagged per cavity + X pcs per cavity
Dimensional Results	**Measurement records** of geometrical characteristics must be done on tagged samples as far as possible. Clearly state which method is used to evaluate each characteristic and preferably use a ballooned drawing or drawing coordinates as references in the records. Special methods are commented below: • When 3D laser scanning is utilized, references must be set according to drawing, never "best fit". Attach clear visual pictures of views needed to be accounted for and set an appropriate resolution for the tolerance scale. • When 3D drawings are utilized, SQE and R&D must communicate how the results should be referenced, accounted for and presented.
Laboratory and Functional Results	**Measurement records** and results of non-geometrical characteristics must be done on tagged samples as far as possible. If destructive sample evaluation is used, the analysis must be done on samples from the same PPAP batch with matching quantity to the "measured and tagged" samples. No samples for destructive tests needs to be submitted, if not requested so. Examples of destructive and non destructive laboratory and functional test: • Spectrometer analysis

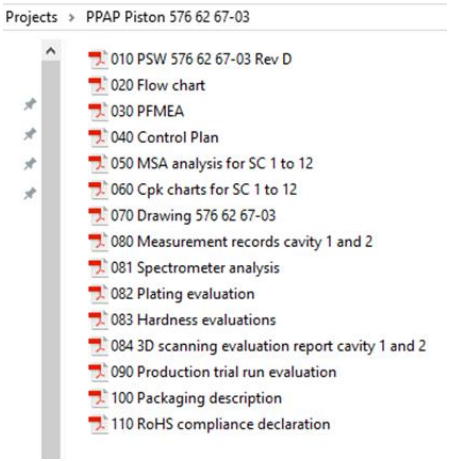
	• EoL-test results and software version verification • Pressure testing • Durability test results • Hardness evaluation and case depth • Plating or paint thickness, adhesion etc. • Etc.
Packaging	**Packaging requirement verifications** such as measurement evaluation records, drawings, pictures and quantity per box and pallet must be attached. Packaging requirements differ between Husqvarna manufacturing locations. If no packaging requirements from Husqvarna, the supplier must still submit clear pictures, descriptions and measurements of what the packaging will look like in serial deliveries.
AAR	**Appearance Approval Report**, when applicable, color evaluation records or other surface requirements verifications.
RoHS	**RoHS documentation or a signed declaration of compliance** to RoHS regulations must be submitted for new parts or when changes of material. The first tier supplier is responsible to gather RoHS information for the full part, including sub parts.
REACH	**When applicable:** Evidence of REACH compliance.
Production Trial Run Template	**When requested:** Utilize and attach the “Husqvarna Production Trial Run Template” in the PPAP Production Trial Run. The requirement to use it will be communicated in advance and when deemed necessary, a production trial run can also be requested for sub parts.

7 PPAP Submission & Format

All PPAP samples and documents must be submitted to receiving factory's PPAP department. If you do not know where to submit the PPAP, the responsible SQE or Quality Manager can help out.

The package containing the PPAP samples must clearly be marked with "PPAP samples" and the PPAP documentation should preferably be submitted in PDF-format. Summarize all documentation, compress it to a zip-file package, and then submit it.

Below is a good example of how to organize the PPAP documentation before submitting it to the PPAP department.



Note: In above picture, the numbers 080-084 are all measurement evaluation records.

8 PPAP Review & Disposition

The PPAP review process starts when the PPAP is received and registered. Below table shows what dispositions a PPAP submission can result in and what actions that are required. Following requirements have to be met to approve a PPAP:

- All items by the PPAP level or separate agreement must be submitted (supplier responsibility)
- Samples must be according to specifications (supplier responsibility)
- RoHS and RML compliance must be attached (supplier responsibility)
- REACH compliance must be attached when applicable (supplier responsibility)
- Technical status on the part must be approved (Husqvarna R&D responsibility)

Disposition	Explanation and Action
Approved	The PPAP meet all requirements and depending on situation, the supplier can start to deliver according to demands or project call off's. A signed interim or approval of a PSW on a top level part number, all non Husqvarna designed parts are always assumed to be: • According to specifications • Process assured by the supplier • Tested and verified in its intended form, fit and function In case of any quality performance issues of, or caused by, non Husqvarna designed part numbers, the supplier is held responsible.
Rejected	The PPAP does not meet the specifications or requirements. The reasons behind a rejection are described in the PSW or attachments. Depending on the origin of a rejection, following is the next step: 1) **Supplier origin**: Address the nonconformities with corrective actions and resubmit a new corrected PPAP. Depending on nonconformity, the supplier might need to implement a 100% sorting operation until a suitable solution is implemented. Resubmission is made on supplier expense. 2) **Husqvarna origin**: The supplier does not need to take any actions until Husqvarna communicate how to proceed.
Interim	An interim approval is a time/quantity limited approval. The required actions are the same as for a PPAP rejection.

9 Connected Documents and Requirements

Below connecting documents are strongly recommended to read:

- Husqvarna Part Submission Warrant_Template
- Husqvarna APQP Template
- Husqvarna APQP Template_Instruction
- Husqvarna Production Trial Run_Template
- Husqvarna Special Characteristics Manufacturing Requirements_Definitions
- Husqvarna Colour Reference Order Form
- Several packaging instructions depending on where the parts are intended to be shipped.

All documentation can be found at this location:
https://purchasing.husqvarnagroup.com/general-requirements

10 Version History

The version is managed automatically by How We Work. There is no need for manual modification.

Version number	Tracking of changes in the document	Date
Version history - SharePoint	Review / Compare function of Microsoft Office	Version history - SharePoint