1 PURPOSE & SCOPE

This document describes the general PPAP requirements for PPAP submissions to Husqvarna sites globally. The PPAP requirements are built on the ISO manual for PPAP requirements were some adaptions have been made to better fit the Husqvarna organization. Furthermore, there might be minor local variations from this general instruction at certain sites.

The information and instructions in this document are an elaborated version of the former instruction HQAP.

2 Abbreviations and Technical Terms

Below explanations to some of the technical terms and abbreviations in this document:

PSW	Husqvarna Part Submission Warrant (PPAP frontpage)
ECR	Engineering Change Request
ECO	Engineering Change Order
DS	Design Samples
EP	Engineering Pilot
MP	Manufacturing Pilot
SoP	Start of Production
TOk	Technical Ok, the technical verification on a part.
Product	The final complete product that is distributed to the market
Part	A single part or assy included in a product
BoM	Bill of Material
Top level part	The highest level part number in a BoM list
Supplier	1st tier supplier, the supplier providing a part to Husqvarna
Sub supplier	2nd tier or further
OEM	Original Equipment Manufacturer
Special Characteristic	A characteristic with a certain impact to the final product. The term “Special Characteristic” is never abbreviated as SC in this document:
CC	Critical Characteristic
SC	Significant Characteristic
IC	Inspection Characteristic
RML	Restricted Material List; a list containing the restricted substances. RoHS and REACH requirements are included in the RML.
IA	If Applicable

3 Connected PPAP Prerequisites

Below processes have a significant impact to a PPAP disposition.

3.1 RML Compliance

Parts must comply to Husqvarna RML which includes RoHS and REACH. Any RML compliance unclarities are handled by the Sourcing Compliance Coordinator.

The supplier providing the full part to Husqvarna is responsible to make sure the RML compliance documentation cover the top level part number and is submitted in good time prior to the PPAP submission.

3.2 Design Samples

During the development process Husqvarna R&D will request samples from suppliers. The most common type is design samples to be requested for evaluation and testing.

The DS is separate from the PPAP process, but the supplier is strongly advised to produce and evaluate DS in intended serial production equipment to contribute to the coming process assurance.

3.3 Technical Release

The Husqvarna term for a part's technical release is TOk (Technical Ok). The technical verification process is parallel to the PPAP process, but a PPAP can not be approved unless there is a TOk of the part.

The technical evaluation may be necessary to be conducted on both new project- and serial production PPAP samples.

3.4 Packaging

The packaging requirements for Husqvarna production sites can be found in below link:

Documentation | Husqvarna Purchase (husqvarnagroup.com)

The common denominator in each site's packaging requirements is that the supplier must use durable and weather proof packaging. This is especially important for parts sensitive to corrosion, humidity and heat during transport. In these cases, the supplier is expected to provide packaging proposals to reduce the effect of environmental conditions.

The receiving factory's production engineering has the most weight for packaging approvals.

4 Supplier PPAP Responsibilities

The supplier providing the part to Husqvarna is responsible to make sure all the requested items are included in a PPAP submission. The supplier is also responsible to process assure sub supplier parts which include to gather, review and make sure the sub supplier PPAP documentation is in order.

If any PPAP documentation from any tier supplier has discrepancies or nonconformities, the supplier providing the part to Husqvarna is responsible to follow up corrective actions and resubmit a corrected PPAP.

PPAP responsibilities for appointed sub suppliers depends on the setup in the project and what has been agreed upon.

For serial production, the supplier is responsible for sub supplier part quality, including Husqvarna appointed suppliers.

5 Mandatory PPAP Submissions Reasons

Any changes of design, production process or production equipment (including measurement equipment type) at any tier supplier must be confirmed and approved by a PPAP. If a change has been implemented without PPAP approval, the supplier is held accountable for subsequent consequences.

Below described cases are copied from the PSW and state when a PPAP must be submitted:

- New part number
- Resubmission (of a previous rejected- or interim PPAP)
- ECO implementation (design change)
- Tool maintenance (changed or refurbished tool)
- Tool replacement
- Production process change
- Transfer of full or any included part (change of plant or supplier)
- Quality performance
- When requested (if the part has not been manufactured during the past twelve months)

6 PPAP Requirements

The Husqvarna PPAP requirements are very similar to the applicable standards except for a few minor changes in the PSW, PPAP level contents and interim classes.

The general PPAP requirements for all PPAP submissions to Husqvarna follow below:

1) The **Husqvarna PSW** is mandatory to use.
2) **The PSW** must represent the top level Husqvarna part number and revision state even if the reason for submission is a sub part change.
3) **All documentation** must be referenced to the part number it represents.
4) **PPAP samples** must be:
   a) Produced in serial production conditions, equipment and operators.
   b) Top level parts. Sub part samples will be specifically asked for if needed.
   c) Sampled from a production trial run when requested.
5) **A "Production Trial Run"** is a limited and controlled production quantity to verify the serial production equipment and conditions and produce the samples to be provided in a PPAP submission. The samples, capability analysis and other data is drawn from the trial run and then summarized in the PPAP submission. The trial run quantity is communicated in the connected ECO, purchase order or PPAP call off. The "production trial run" is also commonly known as; "full run test", "significant production run", "PPAP trial run", "Run at rate" etc.
6) **Net Weight** has to be noted in the PSW because of logistical reasons:
   a) Net weight is the weight of the full top level part (excluding packaging).
   b) Weight unit is "Gram".
   c) Mean value of appropriate quantity if multiple tools or cavities.
7) **Special characteristics** must be clearly highlighted in:
   - (P)FMEA
   - Control Plan
   - Work- and inspection instructions
8) **Nonconformities** must be clearly highlighted in measurement records or summarized in close connection to the PSW.
9) **Corrective actions** to nonconformities have to be attached.
10) **Supplier signature** means that the PPAP submission documentation is in order and that any nonconformities are accounted for.
11) **A PPAP approval** always assumes that all submitted parts conform to specifications if no nonconformities are accounted for. The supplier is always responsible for consequences of unaccounted nonconformities.

6.1 PPAP Items

Below follows an explanation of all different items in a PPAP:

Item	Explanation
PSW	**Part Submission Warrant**, the frontpage showing the general key information about the PPAP.
Drawings	**All drawings** and specifications, ballooned where applicable.
Flowchart	**Process Flow Chart** for the top level or main part.
(P)FMEA	**(Process) Failure Mode and Effect Analysis** for the top level or main part.
Control Plan	**Control Plan** for the top level or main part.
MSA Studies	**Gage R&R studies** have to be provided for all SC's and CC's or when applying for a change of measurement equipment type. For electrical characteristics, the SQE will inform what has to be accounted for.
Capability Studies	**C_{pk} and C_p studies** for all SCs' and CCs' made by above MSA compliant measurement equipment. Include at least 30 pcs from each manufacturing origin (tools, cavities, lines etc) in different graphs. The capability requirements are: • **C_{pk}>1,33** for two sided tolerances • **C_p>2,0** for one sided tolerances or when tool wear is considered. • For electrical characteristics, the SQE will inform what has to be accounted for.
Samples	**Sample quantity** is communicated in the connected ECO and/or the PPAP call off. The general requirement for sample quantity is: *5 pcs measured and tagged + 20 pcs for testing* If multiple manufacturing origins of parts (tools, cavities production lines etc): *3 pcs per origin measured and tagged + X pcs per origin for testing* No sub parts are to be submitted unless stated so.
Dimensional Results	**Measurement records** of geometrical characteristics must be verified on tagged samples: • Measurement equipment noted for each characteristics. • Connect characteristics to ballooned drawing. • 3D laser scanning must be aligned to drawing references/datums, NEVER aligned to "best fit". • 3D scanning tolerances must be displayed by a color gradient between max and min tolerances. Attach clear visual pictures of views. • 3D drawings must have ballooning of characteristics in the same way as 2D drawings. • If a part need to be destroyed to evaluate geometrical characteristics, samples from the same PPAP batch and same quantities as mentioned by "samples" must be used. No need to include the destroyed samples in the PPAP if not requested to do so.
Laboratory and Functional Results	**Measurement records and results** of non-geometrical characteristics must be done on tagged samples if possible. In case of destructive evaluation, samples from the same PPAP batch and same quantity as mentioned by "samples" must be used. No need to include destroyed samples in PPAP if not requested to do so. Examples of destructive laboratory- and functional evaluation: • Material certificate • Spectrometer analysis • EoL-test results and software version verification • Pressure testing • Hardness and case depth • Plating or paint thickness, adhesion etc. • Etc.
Packaging	**Packaging requirement verifications** has to be accounted for by measurement records, drawings, pictures and quantity per box and pallet.

Item	Explanation
	Packaging requirements differ between Husqvarna manufacturing locations. Despite packaging requirements or not, the supplier must still submit clear pictures, descriptions and measurements of what the packaging will look like in serial deliveries.
AAR	**Appearance Approval Report**, if applicable, color evaluation records or other surface requirements verifications.
Production Trial Run Template	**If Applicable:** When requested, utilize and attach the "Husqvarna Production Trial Run Template" in the PPAP Production Trial Run.
RoHS Compliance	**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 Compliance	**When applicable:** Evidence of REACH compliance.

6.2 Mandatory Submission Items

The mandatory submission items in a PPAP are stated by respective PPAP level checkbox in the PSW. Any changes or exemptions of the mandatory items are communicated in connected ECO or by the SQE. Below matrix is a copy of the items by each PPAP level checkbox in the PSW. In case of differences between below matrix and the PSW, the PSW is always the reference:

Submission Item ↓ / PPAP level →	0[1)]	1	2	3	4[2)]	5[3)]	6[4)]
PSW	✓	✓	✓	✓	✓	✓	✓
Drawings	✓	✓	✓	✓	✓		IA
Flowchart				✓	IA		IA
(P)FMEA				✓	IA		IA
Control Plan				✓	IA		IA
MSA Studies				IA	IA		IA
Capability Studies				IA	IA		IA
Samples	✓		✓	✓	✓		IA
Dimensional Results	✓		✓	✓	✓		IA
Laboratory and Functional Results			✓	✓	IA		IA
Packaging description				✓	IA		IA
Appearance Approval Report			IA	IA	IA		IA
Production Trial Run Template				IA	IA		IA

[1)]Level 0 is used for tool approvals from tool suppliers in North America.

[2)]Level 4 is used for part- or process changes where all characteristics affected by the change must be verified and accounted for.

[3)]Level 5 is the same as level 3 but all items except PSW are kept at supplier location.

[4)]Level 6 is customized where requested items are stated in the ECO by the responsible SQE.

6.2.1 PPAP Submission Items for Top Level Parts

In general, a PPAP request for a top level part number and the included sub parts need to be supported by a description of which submission items that should be provided for respective part in the BoM list. The responsible SQE usually describes the requirements for top level PPAP submission in the ECO.

If no description has been given about the PPAP items for each part, then the flowchart, (P)FMEA, control plan should be provided for the top level or main part. For included Husqvarna designed and standard parts, from any tier supplier, the following items are the minimum to be accounted for in a top level PPAP submission:

- Drawing.
- Dimensional results.
- Laboratory and functional results (including material composition evaluation).
- IA, MSA studies for SC and CC.
- IA, capability studies for SC and CC.
- IA, description of how to comply to “Husqvarna Special Characteristics Requirements”

All evaluation evidence must be provided according to the same sample quantities as described in the “PPAP Items” section.

For supplier designed parts and SPD (Sourced Product Development), the required PPAP items will be decided case by case.

The supplier providing the top level part to Husqvarna is responsible to collect, verify and attach the required PPAP items from suppliers.

7 PPAP Submission

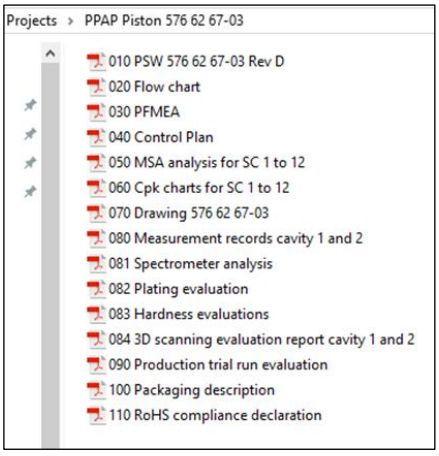
The PPAP submission address and how it is communicated depends on which category and site it belongs to and which status the part has:

- **For new projects**, the submission address will be communicated by the project team, either by an ECO, project sourcing or the SQE.
- **For serial production parts**, the submission address is generally the receiving factory.

If the PPAP address is not communicated or unclear, contact the SQA department for information.

When submitting a PPAP, make sure:

- The sample package must be clearly marked with “PPAP samples”, part number and referring to correct “attention”.
- All PPAP documentation must be collected and submitted in packages, either as PDF- or ZIP-format. In case of significant file size, the PPAP documentation can be divided into multiple parts, but make sure the different parts are send close together time wise.
- In case multiple documents and document types, make sure the documents are named and organized. See picture to the right.



8 PPAP Review & Disposition

The PPAP review process starts when the PPAP is received and registered. Below table shows which dispositions a PPAP submission can result in and which 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)
- RML compliance must be confirmed prior to the PPAP submission (supplier responsibility)
- Technical status of 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 delivery plans 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 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 an approval for limited time or quantity. If the interim is issued because of supplier nonconformities, the supplier must resubmit a new PPAP with corrected nonconformities in due time.

9 Connected Documents and Requirements

Below connecting documents are connected to the process assurance:

- Husqvarna Part Submission Warrant_Template
- Husqvarna APQP Template
- Husqvarna APQP Template_Instruction
- Husqvarna Production Trial Run_Template
- Husqvarna Special Characteristics Requirements
- Husqvarna Color Reference Order Form
- Packaging instructions to receiving factories

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