Training document for PPAP Level 1

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AT&S

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Agenda

- **General informations about PPAP**
- AT&S PPAP form Part 1
- PPAP Process Requirements
- AT&S PPAP form Part 2 (PSW)

What is PPAP?

The Production Part Approval Process (PPAP) is a standardized process in the automotive and aerospace industries that helps manufacturers and suppliers communicate and approve production designs and processes before, during, and after manufacture. Created in hopes to promote a clearer understanding of the requirements of manufacturers and suppliers, PPAP helps ensure that the processes used to manufacture parts can consistently reproduce the parts at stated production rates during routine production runs. For those in the automotive industry, the PPAP process is currently governed by the PPAP manual published by the Automotive Industry Action Group (AIAG).

What's included in a PPAP?

The PPAP manual is the ultimate resource for those in automotive supplier quality management. The manual contains the PPAP checklist which includes all the requirements, called elements, for a complete PPAP package. The checklists identify different PPAP levels (from 1 to 5). For those in the automotive industry, there are 18 possible elements that must be checked off. The aerospace industry has a similar set of elements to be completed during the development, planning, and design of the production process. Each PPAP level determines the specific requirements for each element and indicates which elements should be submitted to the customer. It is important to note, however, that the supplier, regardless of PPAP level, must complete every applicable element no matter what level the PPAP is.

When is a PPAP required?

A PPAP is required anytime a new part of change to an existing part or process is being planned. A customer may request a PPAP at any time during the life of a product. For suppliers, this means maintaining a quality system that develops and documents all of the requirements of a PPAP submission, no matter if you have been asked to deliver one, is a must. Customers are not responsible for creating PPAPs, suppliers are.

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AT&S PPAP form Part 1

PPAP Übersichtsliste

PPAP general view

Submission Level

Material name

Type

No.	Requirements	gefordert demand	Level 1	Level 2	Level 3	Level 4	Level 5	erfüllt fulfilled	nicht anwendbar not applicable	Bemerkungen Remarks
			X							

AT&S normally order PPAP Level 1

12	*Qualified Laboratory Documentation*	R
13	*Appearance Approval Report,*	S

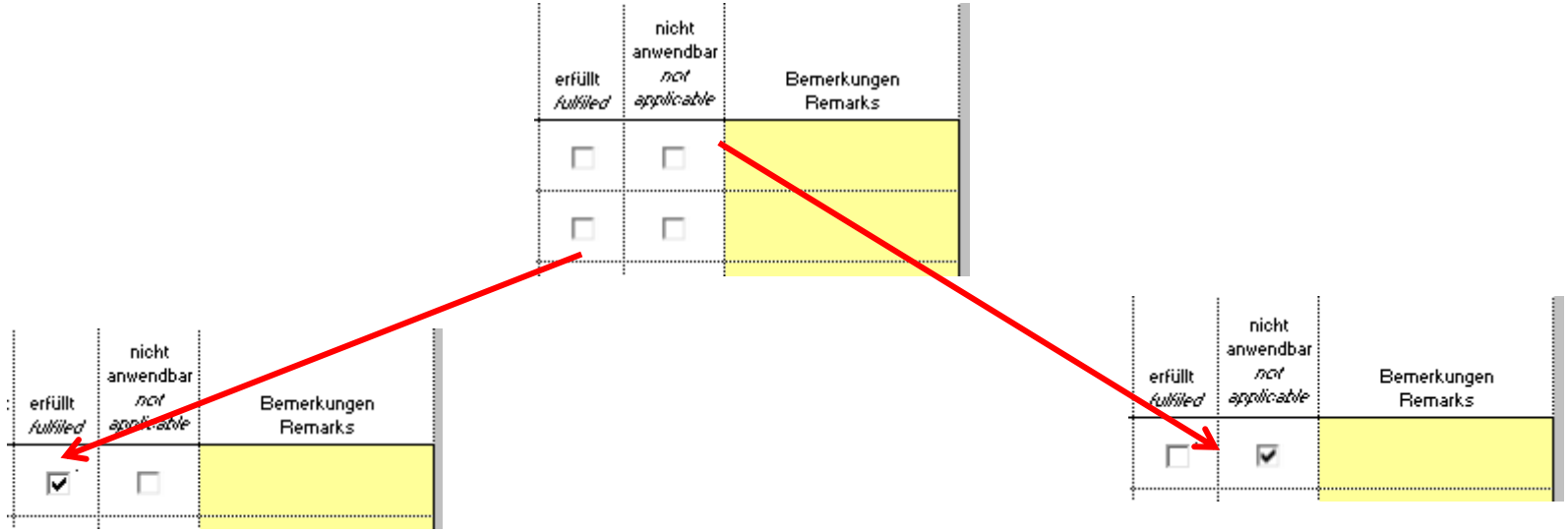
S - The organization shall submit to the customer and retain a copy of records or documentation items at appropriate locations

send to customer

R - The organization shall retain at appropriate locations, and readily submit to the customer upon request

do not need to send to customer

AT&S PPAP form Part 1



Fullfield

Maybe with remark how you fullfill this point

Not applicable

With remark why you did not fullfill this point

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PPAP Process Requirements

1 - Design records of saleable product

A printed copy of drawing needs to be provided. If the customer is responsible for designing, this is a copy of customer drawing that is sent together with the Purchase Order (PO). If supplier is responsible for designing this is a released drawing in supplier's release system. "Each and every feature must be “ballooned” or “road mapped” to correspond with the inspection results (including print notes, standard tolerance notes and specifications, and anything else relevant to the design of the part).“

2 - Engineering Change Documents, if in existence

The ‘*Engineering Change Documents’* section should include any marked and signed drawings specifications etc. that state or authorize the supplier to deviate or change any part of the instructions from the design record (normal signed by a customer engineer or VIP). You should also include any Applicable Engineering Permit(s) and any extra comments that relate to deviation of design or engineering changes. If the Supplier PPAP submission includes changes referenced on a submitted Supplier Change Request (SCR) form, then copies of the approved SCR must be included in this section of the PPAP.

PPAP Process Requirements

3 - Customer Engineering approval, if required

This approval is usually the Engineering trial with production parts performed at the customer plant. A "temporary deviation" usually is required to send parts to customer before PPAP. Customer may require other "Engineering Approvals".

4 - Design FMEA

Please note that this is only applicable when the supplier has the design responsibility.

Design Failure Mode and Effects Analysis (DFMEA) is an application of the Failure Mode and Effects Analysis (FEMA) principles but is specifically aimed at the design stage of the process. The basic concept of the DFMEA is to understand where the product design could fail. The DFMEA method allows the design team to document what they know and suspect about a product's failure modes prior to completing the design, and then use this information to design out or mitigate the causes of failure.

Ideally, the DFMEA is begun at the earliest stages of concept development, and can then be used to help winnow down competing designs and generate new, more robust concepts.

PPAP Process Requirements

5 - Process Flow chart

Process Flow Diagram, also known as a process flow chart, shows the document and clarifies all steps required in the manufacturing of the part in question. The process flow diagram must match both the control plan and the Process Failure Mode and Effects Analysis (PFEMA). The process flow diagram must include all of the main steps in the processing of the part and also all offline activities such as handling, measuring, inspection etc. The diagram also needs to show the flow of non-conforming materials (rejects), parts that can be salvaged, and parts that can be waste or scrap from the product.

6 - Process FMEA

A copy of the Process Failure Mode and Effect Analysis (PFMEA), reviewed and signed-off by supplier and customer. The PFMEA follows the Process Flow steps, and indicates "what could go wrong" during the fabrication and assembly of each component.

7 - Control Plan

A control plan of the process should be included in your PPAP submission. It should mirror the PFEMA and be signed by the relevant parties. You may want to include areas such as early production containment. This area can also be seen as a Pre-Launch Control Plan if the part is completely new or if no relevant control plans exist.

PPAP Process Requirements

8 - MSA-List / Measurement System Analysis Study** (MSA)

MSA is a study in itself. However in the PPAP the supplier must demonstrate its own MSA system and must record all tools and instruments used to measure or check the raw materials and finished parts that are listed in the control plan.

Please note that the supplier's MSA system should conform to their relevant ISO or TS standard.

9 - Dimensional Result (See PPAP Result reports***)

In this section of the PPAP the supplier can record any measurements taken from the finished part. This will include the size, length, width, angles, thickness and any other measurements specified by the customer or the design drawing. Make sure each measurement is ticked off to ensure it has passed the test.

If any parts do not meet the correct specification for a valid reason which could continue into mass production then the supplier should create an exception report. This will document any abnormal readings, and these should be commented on to show why these anomalies have taken place.

PPAP Process Requirements

10 - Material, Performance Test Result (See PPAP Result reports***)

This should include a summary of all tests that have been performed on the part in question. The summary should document any pass or fails that have been identified. It should be signed off by the customer and the supplier to show that all the tests that are required have been done and any additional data for the tests has been submitted.

11 - Initial Process Studies, if required

During the initial process studies stage of the PPAP the customer needs to start performing internal studies. The supplier needs to complete any customer required studies. An SPC can be used to demonstrate the processes capability.

12 - Qualified Laboratory Documentation

If testing is performed in a supplier's internal lab, they must provide a copy of their quality certification. The supplier should also provide documentation from an independent test house or the data from the RAW supplier.

PPAP Process Requirements

13 - Appearance Approval Report

The appearance approval report needs to be included in the PPAP. This is produced from the appearance approval inspection process. This needs to be signed by the customer and include any other documents or concerns related to the appearance of the product.

14 - Sample Production Parts (includ. Material test report)

A number of pictures can be included of the sample part from the same production run that has been analyzed throughout the PPAP. Also, a picture of any storage area and packing instructions / images can be included in this section.

15 - Master Sample

A sample signed off by customer and supplier, that usually is used to train operators on subjective inspections such as visual or for noise.

PPAP Process Requirements

16 - Checking Aids

When special tools are used they should be photographed, documented and included in this section, and this should also include the calibration records of the tools and the dimensional report from the tools.

17 - Records of Compliance with Customerspecific Requirements

Each customer may have specific requirements to be included on the PPAP package. It is a good practice to ask the customer for PPAP expectations before even quoting for a job.

18 - Part Submission Warrant (PSW)

This is the form that summarizes the whole PPAP package. This form shows the reason for submission (design change, annual revalidation, etc.) and the level of documents submitted to the customer. There is a section that asks for "results meeting all drawing and specification requirements: yes/no" refers to the whole package. If there is any deviations the supplier should note on the warrant or inform that PPAP cannot be submitted.

PPAP Process Requirements

19 - Bulk Material Requirement Checklist

The term “bulk material” is used to refer to a granular or lumpy mixture existing in a free-flowing form. A bulk material’s properties are defined by its grain size and grain size distribution, as well as by its bulk density, angle of repose, moisture, and temperature.

Bulk materials are classified into two groups:

Cohesionless, free-flowing bulk materials

Cohesive bulk materials

The following are some important characteristics of bulk materials:

Bulk density

Angle of repose

Grain size

Grain size distribution

Grain shape

Cohesion

Adhesion

PPAP Process Requirements

20 - QM – System Certificate (also EMS)

All relevant QM Certificates

21 - MSDS

Material Safety data sheet

22 - Material data form

Material data

23 - Technical data sheet

Technical data sheet

PPAP Process Requirements

24 - PPAP Result reports***

This measurements has to be done on one specific material type which will be defined by AT&S. The supplier need to measure each item at least 25 times, and has to fill the results in AT&S „PPAP Result reports“ file.

25 - Statement of substance if required (IMDS)

The **International Material Data System** (IMDS) is a global data repository that contains information on materials used by the automotive industry. Several leading auto manufacturers use the IMDS to maintain data for various reporting requirements.

In the IMDS, all materials present in finished automobile manufacturing are collected, maintained, analyzed and archived. IMDS facilitates meeting the obligations placed on automobile manufacturers, and thus on their suppliers, by national and international standards, laws and regulations.

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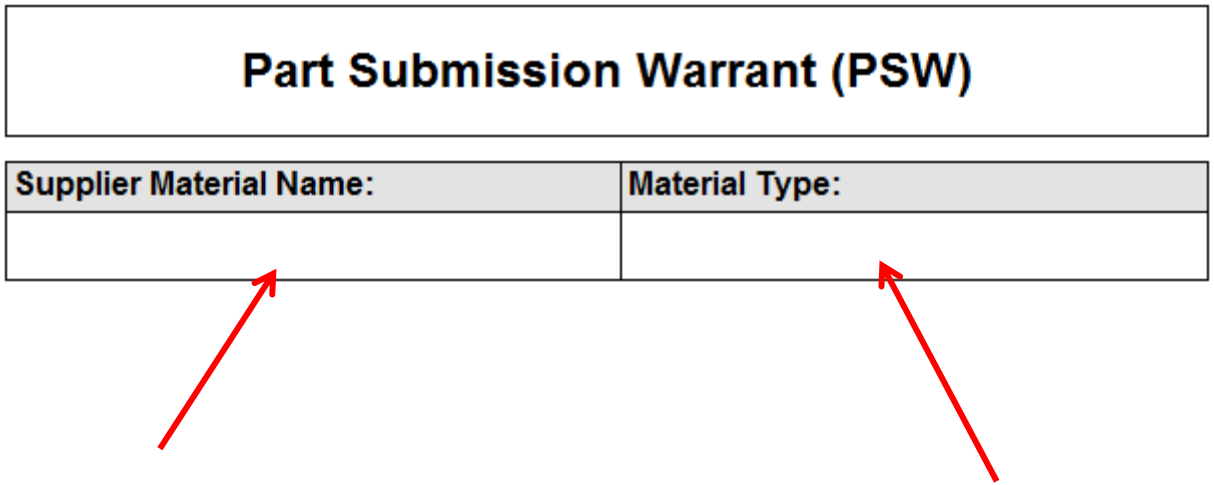
Part Submission Warrant (PSW)



Part Submission Warrant (PSW)

Supplier Manufacturing Information:		
Supplier Name:		Street Address/ Zip:
City:	State:	Customer:

Application: ☐ Laminate ☐ Prepreg ☐ RCF ☐ Copper foil ☐ Solder mask ☐ Others:

☐ Ink ☐ ECP ☐ Offload

Fill in the supplier manufacturing Information

Fill in the correct application for the relevant material

Note: Does this part contain any restricted or reportable substances? ☐ Yes ☐ No

Click yes or no for restricted or reportable substrances

Part Submission Warrant (PSW)

Reason for Submission:

☐ New supplier	☐ Change of sub-supplier
☐ Engineering change	☐ Change to optional build up
☐ Change in process flow	☐ Correction of Discrepancy or Improvement project
☐ New resin type	☐ New material
☐ New plant for supply	☐ Material not delivered within 1 Year
☐ New Component	☐ Other – please specify

Please choose correct reason for Submission

Part Submission Warrant (PSW)

Submission Results:

The sample results comparing to AT&S Material specification:

- ☐ Within specification
- ☐ Without specification (please explain why)

Explanation / Comments:

Please choose Submission result –

don´t forget the comments

Part Submission Warrant (PSW)

Print name:	Title:	Phone Nr:	Fax Nr:
Supplier Authorized Signature: Date:			

Please fill in correct data

Print out the completet PPAP, sign the page and scan the hole PPAP

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