VDA | Verband der Automobilindustrie

2

Quality Management in the Automotive Industry

Quality Assurance for Supplies

Production process and product approval (PPA)

5th revised edition, November 2012

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Verband der Automobilindustrie e.V. (VDA)

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References to standards

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Translations

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Preamble

Within the framework of globalisation the submission of sampling for approval as standard practice has become a central task in quality management. Constantly increasing cost pressures, in parallel with increasing risks associated with deliveries in terms of maturity level and product quality demand an efficient interplay in the production process and product approval PPA.

Cost advantages and greater competitiveness in the production of large quantities can be achieved only if a standard procedure for production process and product approval is established throughout the supply chain.

At the same time any friction at the interfaces between supplier and customer should be minimized by cooperation between partners in the enterprise.

With the first edition of VDA volume 2 in the series "Quality management in the automotive industry“ published in 1975 framework guidelines were laid down for assessing the quality capability of suppliers, the initial sample submission procedure and the quality of production parts in Goods Inwards inspection.

In the second edition of VDA volume 2 which appeared in 1995 a description was provided of the procedure for assessing the quality performance of production deliveries and the initial sample submission procedure in their basic form.

With the third edition in 1998 the alignment with international quality management standards in the automotive industry was completed. In addition the publication was condensed and matters already covered comprehensively in other VDA publications were no longer covered.

As part of the 4th edition in 2004 the production process and production approval (initial sample submission) was described afresh in significant areas. The subject of material data sheets / IMDS has been fully revised and described by the VDA "material data sheet" working group.

With the publication of this 5th edition the PPA Process has been completely restructured in order to describe the requirements relating to new or modified deliveries from external sources and those produced within the company.

The area of application is defined more clearly, taking into consideration existing VDA publications and terms. As an aid in implementing the stipulations in this present publication a sequence diagram for PPA is included, as well as the "trigger matrix" for changes which must be declared.

To improve understanding, the requirements relating to submission level have been stated more precisely. A significant up-date covering process validation has also been introduced, together with submission level "0". All the changes which have been made are taken into account in the completely revised form for production process and product approval in accordance with VDA volume 2.

We thank the participating organisations and their employees for their contributions in the compilation of this document. The following companies were involved in drawing up the volume:

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Our thanks also go to all who have given us encouragement and assistance in generating and improving the document.

Berlin, November 2012

VERBAND DER AUTOMOBILINDUSTRIE E.V. (VDA)

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1 Introduction

In the automotive industry shortening development times, the range of projects and increased out-sourcing and internationalisation make intensive cooperation between customers and suppliers throughout the entire supply chain of crucial importance.

1.1 Production process and product approval (PPA) – process

The PPA Process is broken down into the approval of the processes used in manufacturing and transporting the products and the approval of the product itself.

The submission of documents accompanying the process and product with the samples for product approval is referred to as the “sampling” (to the customer).

Samples for PPA (initial samples) are products and materials which have been manufactured entirely with production equipment under production conditions as part of the PPA.

Other samples (DIN 55350, Part 15) are products and materials which have not been manufactured entirely under production conditions. Samples of this kind cannot be used for the PPA.

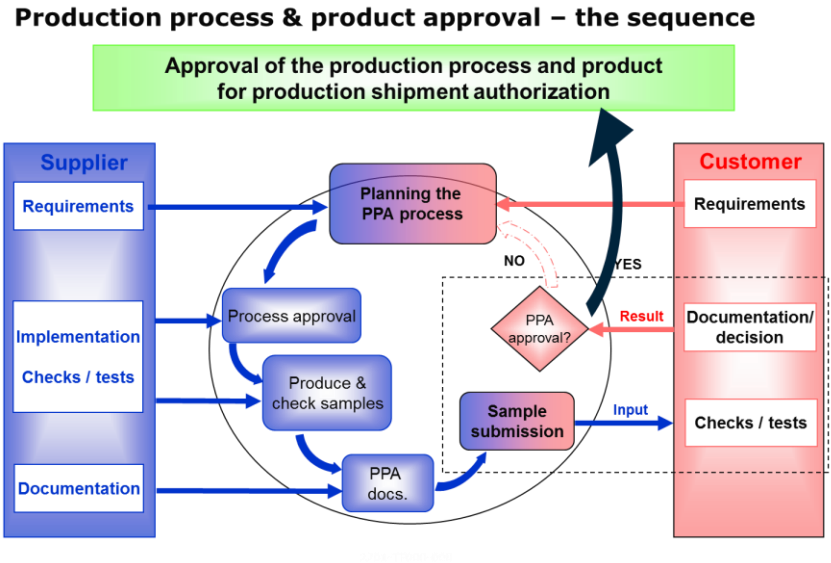


Fig. 1: Overview of the PPA Process

The supplier is responsible for the approval of all components, sub-systems and services provided by his sub-suppliers in order to meet the customer's product and process requirements.

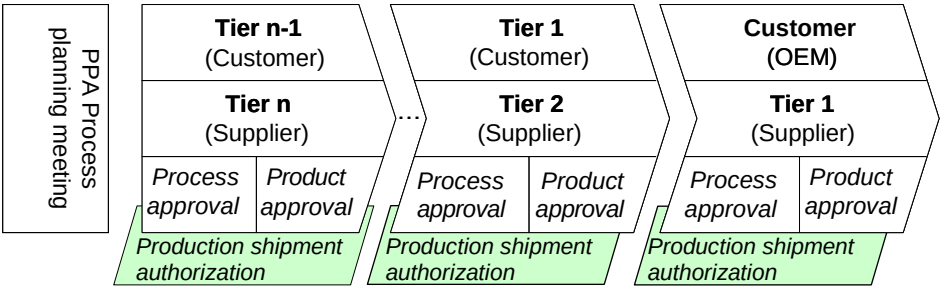


Fig. 2: PPA in the supply chain

1.2 Production process and product approval (PPA) – objective

The PPA Process is used to provide evidence, before the start of production, that the customer requirements agreed in specifications (e.g. the component requirements specification, drawings, standards, packing instructions, document issue levels, colour-sample charts, capacities and flexibility) and other requirements (e.g. legislation, standards) are satisfied.

The approval/release covers the evaluation of **processes** and **products** based on relevant documents, records and PPA samples in order to ensure that the requirements for production deliveries of conforming products have been met by the supplier.

In addition the customer can carry out a process approval exercise (e.g. a process audit to VDA volume 6.3).

Positive results lead to full approval production shipment authorization by the customer.

A decision by the customer not to carry out a review of an PPA Process does not release the supplier from his obligation to carry out a PPA Process and to record the results.

The timing sequence and inter-actions within the overall project are described in the VDA publications "Maturity level assurance for new parts“ (VDA MLA) and "Robust production process“.

The timing of the PPA Process must be agreed between the supplier and customer so that the PPAP and production shipment authorization can be carried out in good time before the first production shipments are required – see section 5.

2 Range of Application

Unless otherwise agreed the procedure is to be used for the following products (systems, modules, parts and components):

- Manufactured products / finished parts (DIN 199-1)
- Spare parts (DIN 199-1)
- Raw parts (DIN 199-1)
- Production materials / auxiliary materials (DIN 199-1) which will become integral parts of the product (e.g., paints, fluid sealing aids, adhesives, oils, brake fluid)

As a general rule services are evaluated within the framework of function checks as part of the PPA Process for the products.

In the case of the supply of software it may also be necessary to carry out an assessment of the processes involved in the software development in terms of the process maturity required by the customer. This assessment may be carried out using Automotive Spice or CMMI for example. The decision as to whether an assessment is necessary is taken within the framework of the project management, based on a risk classification (e.g. to the VDA publication "Maturity level assurance for new parts", risk classification). The assessment is carried out by the customer (for example via the VDA publication to ML3 in the early development phases.

Investment goods such a manufacturing equipment and process materials (e.g. auxiliary and production materials for machines) are not covered by the PPA Process.

Unless otherwise agreed between customer and supplier the PPA Process is also not applied to standard parts (e.g. DIN parts and fluids covered by DIN or SAE).

Note: Standard products with a modified specification must be submitted to the PPA Process.

Note: Vehicle models / assembly plant / vehicle ranges are not the supplier's responsibility and must be secured by the customer / OEM. The publication VDA volume 2 covers components and parts, not complete vehicles.

3 Initiation for a PPA Process

The PPA Process is applied in the case of:

a) new parts or products

b) notifiable modifications which must be reported in accordance with the PPA trigger matrix (appendix 2). This includes:

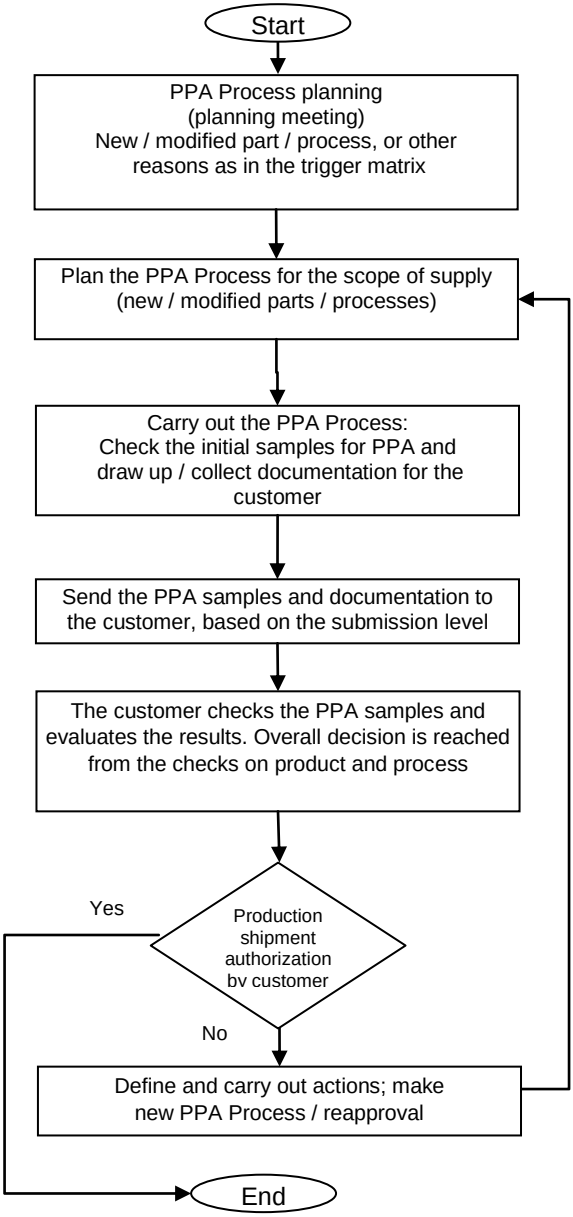
- modifications to products
- modifications to production processes
- long-term production stop for (more than 12 months)

The reasons for initiation in the trigger matrix (appendix 2) may need to be adapted or expanded to cover the specific organisation. However, they represent the defined minimum requirements. If any customer-specific requirements exist, they must be maintained.

Additional reasons for initiating the PPA Process (for example to deal with results from the requalification checks) must be agreed in the customer-specific requirements (VDA publication: "Establishing customer-specific QM system requirements based on ISO/TS 16949“).

For electronic components see the trigger matrix (change assessment matrix) in "Guideline for customer notifications of product and/or process changes (PCN) of "Electronic components for the automotive market". This can be accessed on the ZVEI Homepage: www.zvei.org/PCN.

4 The PPA Process in principle (sampling)



5 Planning and agreeing the PPA Process

The customer and supplier must carry out an agreement of the PPA Process for each product to be examined with the aim of establishing a common understanding of the extent, contents and timing plan for the PPA Process.

Customer requirements may include:

- Initial pre-conditions such as, agreed specifications (including legal requirements), the customer's requirements, drawings, standards, packing instructions, document issue levels, colour-match charts
- Milestones (sequences) must be planned so that a production shipment authorization can be issued at the right time
- Submissions level including documentation requirements
- A specified performance test / process validation (the batch size of the products to be produced must take account of the type of product and variants) – see section 6.2.
- Statement of the quantity of parts to be delivered and checked in the sampling (each tool, cavity, variant, colour, …)
- The customer and supplier can agree that a PPA Process shall be carried out for a defined product range (e.g. product family)
- Measurement and test methods
- Product and process characteristics to be selected for capability studies

The result of PPA Process planning meeting must be documented.

For products which are suitable for an PPA Process and if agreed with the specific customer, the use of the VDA publication "Field failure analysis" must be demonstrated in an appropriate form. Details must be agreed specifically with the customer, for example as part of the planning and agreement of the PPA Process.

- If the same product is made at several different production locations a PPA Process must be carried out for each location. Relevant details of the production location must be recorded in the PPA

documentation. If the same product is made using different production equipment, the same applies.

All essential product-specific test equipment must be made available to the customer by the supplier on request for cross-checks to be made.

Example of a form for PPA Process planning is shown in appendix 3.

Time of Realization:

- For new parts the planning and agreement must be agreed and carried out at the maturity levels stated in the VDA publication "Maturity level assurance for new parts“
- The agreement meeting for PPA Process of new parts is initiated by the customer
- The agreement meeting for PPA Process following changes to production products is initiated by:

  - the customer, if the changes are initiated by the customer
  - the supplier following changes which are required to be reported (as the trigger matrix – see appendix 2)

Notes: An essential requirement for the successful execution of the PPA Process is evidence of the capability of the production process (qualitative and quantitative) under production conditions (production tools, production location, production process conditions).

Process capability is demonstrated statistically on the basis of agreed product and process characteristics (VDA volume 4 "Ring-binder“).

In the case of PPA Process following modifications or an extension to the product family it is permitted to refer to those sections of documents from previous PPA Process where the contents have not changed.

Production shipment authorization can be obtained only by carrying out and providing positive proof of the PPA Process.

6 Selecting submission level

Unless otherwise agreed, samples and the associated documentation will be submitted to the customer in accordance with **submission level 2** (see table 1: "Evidence for PPA".

Possible selection criteria for submission level 0:

- The products involved have no special characteristics
- The suppliers are companies within the same organisation (in-house parts) and sub-contracted processes
- The quality capability of approved suppliers has been demonstrated
- Standard parts
- Change to the supplier no./DUNS no. but no change of production location and/or processes

Possible selection criteria for submission level 1:

- Changes to the products involve little or no risk to maturity level (e.g. no special characteristics are affected)
- The suppliers are companies within the same organisation (in-house parts) and sub-contracted processes
- For a product family: a sample submission is made, covering a single part number to submission level 2 or 3, with a simplified procedure to submission level 1 for all further associated part numbers

Possible selection criteria for submission level 3:

- Products with an increased risk to maturity level or with significant changes
- New-technology changes or significant modifications to existing production processes
- Products with a high level of innovation (for supplier and/or customer)
- Products where there are requirements regarding evidence of compliance of significant/special characteristics (VDA volume 1 "Documentation and archiving“)

Table 1: Evidence for PPA

		Submission level			
	Evidence required, if applicable to the product	**0**	**1**	**2**	**3**
Cover sheet to PPA report		**V**	**V**	**V**	**V**
1	Test results for product approval (e.g. geometry, dimensions, function, materials (strength, physical characteristics), weight, haptics, acoustics, odours, appearance, surface, reliability, ESD tests, electrical reliability)	**D**	**D**	**V**	**V**
2	Samples (quantity / delivery quantity as agreed)	**D**	**V**	**V**	**V**
3	Technical specifications (e.g. customer's drawings, CAD data, specifications, approved design changes, resistance to short-circuit, voltage resistance, functional safety management) (FSM))	**D**	**D**	**V**	**V**
4	Product FMEA	**D**	**D**	**D**	**D**
5	Design / development approval by the supplier (in case of development responsibility)	**D**	**D**	**V**	**V**
6	Confirmation of compliance with legal requirements (e.g. environment, safety, recycling, national certificates)	**na**	**V**	**V**	**V**
7	Material data sheet to IMDS *	**V**	**V**	**V**	**V**
8	Software test report	**D**	**V**	**V**	**V**
9	Process FMEA	**D**	**D**	**D**	**D**
10	Process flow chart (production and test/inspection operations)	**D**	**D**	**D**	**V**
11	Control plan	**D**	**D**	**D**	**D**
12	Confirmation of process capability	**D**	**D**	**V**	**V**
13	Evidence of compliance with special characteristics	**na**	**na**	**V**	**V**
14	List of test/inspection equipment (specific to the product)	**D**	**D**	**D**	**V**
15	Capability study testing equipment, if appropriate (result)	**D**	**D**	**D**	**D**
16	Tooling list (with quantities/number of cavities and information on tooling concept)	**D**	**D**	**V**	**V**
17	Confirmation of achievement of agreed capacity (process validation)	**D**	**D**	**V**	**V**
18	Written self-assessment on the criteria as evaluation matrix for maturity of product and process	**D**	**D**	**V**	**V**
19	Part history	**D**	**V**	**V**	**V**
20	Confirmation of suitability of the products carrying units, incl. storage	**D**	**D**	**V**	**V**
21	PPA status of components in the supply chain (purchased parts, directed parts by the customer and in-house parts)	**D**	**D**	**V**	**V**
22	Approval of coating systems to customer requirements	**D**	**D**	**V**	**V**

Key to abbreviations on the following page

V For Submission at the customer

D execution, documentation and archiving at supplier (if appropriate for inspection by the customer)

na Not applicable; presentation level must not be selected

***** Independent of the contractual arrangements, the material data sheet must be provided by IMDS for items over the real supply chain

6.1 PPA Process

Independent of the submission level or PPA Process planning, the supplier must carry out a PPA and document the results. In this the supplier must produce evidence that requirements 1 to 22 in table 1.

The documents agreed in accordance with the PPA Process planning are essential when providing the customer with evidence of compliance with the requirements.

Within the framework of a process validation (see section 6.2) the supplier must take a random sample (samples for PPA) to demonstrate the product characteristics and evidence of compliance with the specification requirements.

The samples must be clearly identified (e.g. with item numbers), so that they are securely linked to the individual measurements which are made. Where appropriate the identification should also indicate whether the parts are from single-cavity mold or multi cavity mold tools.

The framework conditions of the process validation are used in verifying the process requirements. This will include checks on the capability of measurement equipment and systems, with appropriate records of the results (VDA volume 4 "Ring binder“ and VDA volume 5 "Capability of measurement processes“).

Checks are made on the samples when they are ready for delivery and the results are documented. The results must be compared with the specified requirements. If there are discrepancies, improvements must be made until the internal PPA is to guarantee.

To provide evidence of the product characteristics in accordance with item 1 of table 1 all the requirements contained in the drawings and specifications must be checked and documented (proof of plausibility in the PPA Process planning meeting).

This will include:

- Geometry, dimensions
- Materials, connection technology (strength, physical characteristics)
- Function
- Reliability (endurance test, ageing test, …)
- Appearance (colour, gloss, …)
- Surface (structure, …) VDA volume 16: "Decorative surfaces of external fittings and functional parts in the internal and external areas of automobiles"
- Haptics
- Acoustics
- Odour
- Emissions
- Weight

All characteristics must be clearly identified and shown individually with nominal values, tolerances and actual measured values.

Note: For CAD drawings details must be provided of reference points, test cross-sections and test surface areas.

The verification of the process characteristics is provided via items 9 to 20 of table "Evidence for PPA"

Notes:

Items 4 / 9: Product and Process FMEAs must be must be made available to the customer for inspection as part of the PPA approval.

Item 5: Where development responsibilities are transferred to the supplier, he must provide the relevant releases in accordance with requirements.

Item 7: "Material data sheet to IMDS“: the constituents of products (including original spares and replacement parts) must be documented in the material data sheet (MDB) - see section 8.

Item 8: For examples see appendix 6

Item 11: The control plan provides proof that the information gained from the FMEAs was taken into account when planning and establishing production and that transparent/traceable records of the product and process characteristics are assured, together with control of the production process – see ISO/TS 16949.

Item 13: See VDA volume "Maturity level assurance for new parts"

Item 14: The list of test/inspection equipment must be provided on a product-specific basis with agreement being achieved within the framework of the planning of the PPA.

Item 15: Test/inspection equipment for which capability must be demonstrated to the customer is defined in the planning of the PPA Process.

Item 16: A statement is required of the number of tools (initial and forming tools) used to manufacture the product or the number of cavities in a multi cavity mold (e.g. small injection-moulded parts).

Item 17: Within the framework of process validation under production conditions, evidence must be provided that the required quality and volumes can be produced in accordance with the maximum contractually agreed capacity (see also section 6.2).

Item 18: With the self-assessment the supplier confirms that the product and process meet all requirements in accordance with the defined criteria and that an internal release has been carried out. For an example see appendix 4

Item 19: The part history records all changes (see trigger matrix in appendix 2) to the product and the production process.

Item 20: Evidence must be provided that the proposed storage and product containers used will have no negative effect on the products to be supplied.

Item 21: PPA status of the supply chain (see Fig. 2) must be included in the PPA documents.

The use of parts specified by the customer must be agreed separately with the customer in line with customer-specific requirements – see VDA volume: "Establishing customer-specific QM system requirements based on ISO/TS 16949“ (e.g. responsibility for the PPA Process).

Item 22: For surface-coated products it is usual for the entire system (substrate and surface coating/plating) to be approved/released to the customer's requirements (to ensure paint adhesion, for example).

Notes regarding capability

Process capability must be established and documented for defined characteristics (item 12 in the submission matrix). The methods used for these studies and the capability figures must be agreed between customer and supplier. If no other stipulations are made the following must be achieved as a minimum:

Capability study	**Capability**
Machine capability index, short-term study	$Cm_k \geq 1{,}67$
Process capability index, long-term study, stable process	$Cp_k \geq 1{,}33$
Process performance index, long-term study of non-stable process	$Pp_k \geq 1{,}33$

(see VDA volume 4, ring-binder: "Economical process design and process control“ and "Industrial tolerance process“)

The customer may demand greater capability values for special characteristics (item 13 in table 1).

If a product characteristic cannot be demonstrated with process capability studies (e.g. for welding, heat-treatment, casting, rolling and surface coating processes) evidence must be provided via secondary characteristics or a correlated non-destructive 100% check must be used.

In cases where no appropriate method is available other suitable methods must be developed for the specific parts to demonstrate process reliability in production (random sampling frequency, limiting samples, etc…)

6.2 Performance test / process validation

The purpose of the performance test / process validation is to provide evidence of:

- the process performance and quality capability of the complete manufacturing process under production conditions (production tools, machines, cycle times, personnel, …)
- the ability to produce the agreed quantities to specification with the deployed resources for the customer at the right time (VDA volume: "Maturity level assurance for new parts “)
- Evidence of process validation for new / modified processes and products (e.g. changes, transfer of production) is maintained in accordance with the contractually agreed conditions (timings, extent, frequency). Usually this happens between 0-series and release by the customer for production shipment authorization (VDA volume: " Maturity level assurance for new parts “).

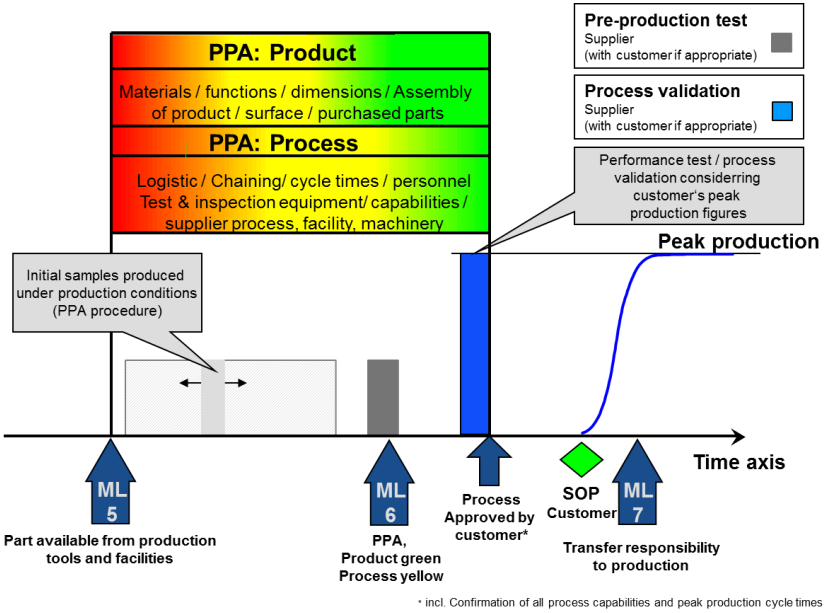


Fig. 3: Timing for process validation by the supplier within the framework of the product creation process

Detailed planning for process validation is carried out in the PPA Process planning as described in section 5.

When specifying the production quantity for the process validation the following aspects must be taken into account:

For deliveries with a high maturity level risk (e.g. classification "A" in VDA volume "Maturity level assurance for new parts") the production quantity and variants will be agreed with the customer on the basis of the following points:

1. The period of production (duration) under full production conditions must be agreed with the customer depending on the production capacity of the equipment (quantity of parts per shift). Unless otherwise agreed the production quantity test is over a period of at least one shift

2. In the case of a product where several variants are involved agreement must be reached with the customer on one or more variants (for process release). For complex contracts with a large number of variants this may make it necessary for a staged performance test to be carried out on several variants adapted to reflect the quantity of samples required and the number of variants.

3. When assessing performance capability agreement must also be reached in particular on the significant influencing parameters which must be taken into consideration for process validation. These may include:
    - General setting-up and maintenance times
    - Rest breaks
    - Tooling concept (e.g. single or multiple-impression tools)
    - Number of production lines
    - Tool changes
    - Shift changes
    - Scrap levels
    - Shift models
    - Planned maintenance shifts
    - Safety reserve for unplanned breaks in production

For deliveries with a low maturity level risk (e.g. classification "B + C" in VDA volume "Maturity level assurance for new parts") and unless otherwise agreed with the customer the quantities are decided by the supplier on his own responsibility. Points 1 to 3 above must be taken into account as appropriate.
In addition the customer defines which performance test with what quantities he would like to accompany and will make his own evaluation.

6.3 PPA documentation

The supplier provides a complete set of PPA documentation (including drawings, specifications, CAD data, etc.) on the basis of the level to be submitted and as agreed in the PPA Process planning meeting. The customer must be able to trace investigations, measurements and tests on the product. Test results must be recorded either with the forms shown in appendix 5 or as required by the customer.

Documents and samples must not be submitted until all specifications have been met. In case of deviation the supplier must obtain a written deviation approval in advance from the customer. The deviation approval must be included with the PPA documents together with an action plan to executed the deviation.

If no deviation approval can be issued the products are not capable from the customer's stand-point and must not be used in the end-product.

6.4 Sample submission and customer's decision on approval for production shipment authorization

The supplier sends the customer the documents agreed in the PPA Process planning (as shown in the submission level matrix) together with the samples for the PPA. The customer evaluates the documents which are presented or submitted and, where appropriate, may carry out counter-checks on the samples. The results of this evaluation are recorded by the customer and a decision is taken regarding approval for production shipment authorization, as follows:

- **OK**
  This means that all the agreed customer requirements (as in the initial sample submission planning) are met without restrictions. Approval is issued for full production shipment authorization.

- **Conditionally OK**
  This means that all the agreed customer requirements (as in the PPA Process planning) are subtotal complied. Deliveries of the product can be made (possibly subject to agreed actions) for a limited period of time or quantity, against production delivery schedules. A reapproval of the PPA Process must be made in good time before the expiry of the specified restriction.

- **NOK**
  This means that all the agreed customer requirements (as in the PPA Process planning meeting) are not satisfied. No approval is

issued for production shipment authorization. A reapproval of the PPA Process is required. The extent of this must be agreed.

Product and process approval can lead to a single or an overall assessment (see section 5). In the case of deviations, these must be identified in the matrix.

The overall result is influenced by the worst individual result. The worst individual result plays an important role in the overall evaluation.

The customer informs the supplier of the result of the evaluation.

6.5 Special procedures

Stepped PPA Process

In exceptional cases the sample submission can be made in several steps – e.g. a sample submission may be made for the materials, including weathering tests before dimensional checks. The details must be agreed between customer and supplier in the PPA Process planning meeting.

Reference can be made to the results from previous steps provided, there have been no changes in production conditions or product characteristics.

PPA Process for part variation

PPA Process for variants must be agreed with the customer as part of the PPA Process planning meeting.

Items to be checked in a PPA Process of part variation can include:

- coloured exterior parts (bumpers, decorative trim, centre consoles, etc …)
- cabling/wiring harnesses
- assemblies which are subject to multiple choice by the customer (seats, door cladding, etc., …)
- assemblies which may use various materials
- vehicle-specific adaption of identical parts (mirror bases, exterior mirrors, national variants (lettering))

On the PPA Process of part variation, it is also possible to check all the standard features first (i.e. those not changing with the variants) before checking the characteristics which are dependent on the variant.

Notes:

a.) standard features first (i.e. those not changing with the variants) may include:

dimensions, functions, material of the base component, …

b.) characteristics dependent on the variant may include:

colour, brilliance, resistance to weathering, …

As a general rule, colour checks are carried out on the basis of master samples which have been released by the customer (colour master samples).

Approval for production deliveries cannot be issued until both the standard and the variant-dependent characteristics have been checked and approved

Low volume production

As a general rule, low volume production describes items not manufactured in fully automated production but are not produced individually.

If it is not possible to demonstrate process capability because of the quantities required, 100% checks are made in production covering agreed product characteristics.

The details must be agreed between customer and supplier in the PPA Process planning meeting.

Note: The term "low volume production" is not capable of precise definition. It may involve small quantities for certain trim levels or to meet active and passive customer desires, special vehicles or products of all kinds, limited quantities or life cycle, etc.

7 Archiving periods

The archiving periods for documents (VDA volume 1 Documentation and Archiving) and reference samples (those retained for future reference) must be agreed with the customer. Essentially the archiving periods are based on legal requirements.

8 Declaration of constituent materials

The constituent materials of products (including original spares and replacement parts) must be documented in the material data sheet (MDB). The material data are assembled and transferred along the supply chain. The international material data system (IMDS) represents an electronic documentation and reporting tool for constituent materials (http://www.mdsystem.com).

Binding and detailed requirements are defined in the relevant current IMDS recommendations and can be called up by any registered IMDS user.

Within the framework of the PPA the MDB (material data sheet) identification number is required as evidence of the declaration of material data using the IMDS. A new material data sheet must be submitted with any PPA involving a change of part-number – see VDA 231-200).

Note: Prohibited substances and those subject to specific declaration requirements, with their associated declaration limits, are set out in the "Global Automotive Declarable Substance List (GADSL) – see also VDA 232-101.

9 Technical terms and abbreviations

For the purposes of this present publication the terms (titles and definitions) in DIN EN ISO and the VDA QMC glossary apply.

In addition:

Outsourced Process	See ISO/TS16949: a process which the organisation needs for its quality management but which is carried out by an external organisation
Reference sample	See DIN 55 350 Part 15: samples which enable values of characteristics, etc. to be measured at a later stage .
DUNS® number	D-U-N-S = Data Universal Numbering System. This is an international standard numeric code for the clear identification of companies/ production locations as well as indicating company group structures. DUNS numbers are issued and managed centrally by Dun & Bradstreet (http://www.dnb.com).
In-house part	Components or assemblies which are made by the organisation itself and are integrated in the overall assembly (complete delivery product)
Material	Chemical elements, compounds or preparations and materials in their finished state from which products are manufactured.
Production transfer	see "Transfer"
Part number	Classification number for a product, such as an assembly, supply item, component, unfinished part, material, etc.
Parts specified by the customer / directed parts	These are parts where an organisation manufactures assemblies and in doing so must use parts where the customer specifies the

	supplier. In this case the organisation is still responsible for the quality – that is, the organisation must take appropriate measures to ensure that these parts comply with the quality requirements
SOP	Start of production
Substance	Chemical elements or compounds as a constituent of materials or preparations.
Transfer	Complete or partial change of production to a new location with the objective of replacing the original production wholly or in part or in order to expand capacities.

10 Appendix documents

Appendix 1 - How to use the trigger matrix (*)

Appendix 2 - Trigger matrix (*)

Appendix 3 - Form for PPA Process planning (*)

Appendix 4 - Matrix for assessing the serial production maturity of product and process

Appendix 5 - PPA form (cover sheet*)

Appendix 6 - Software test report (*)

Appendix 7 - Comparison between PPA and PPAP

10.1 Downloads

The appendix documents are difficult to display in A5 format and are therefore (*) also available free of charge as PDF downloads.

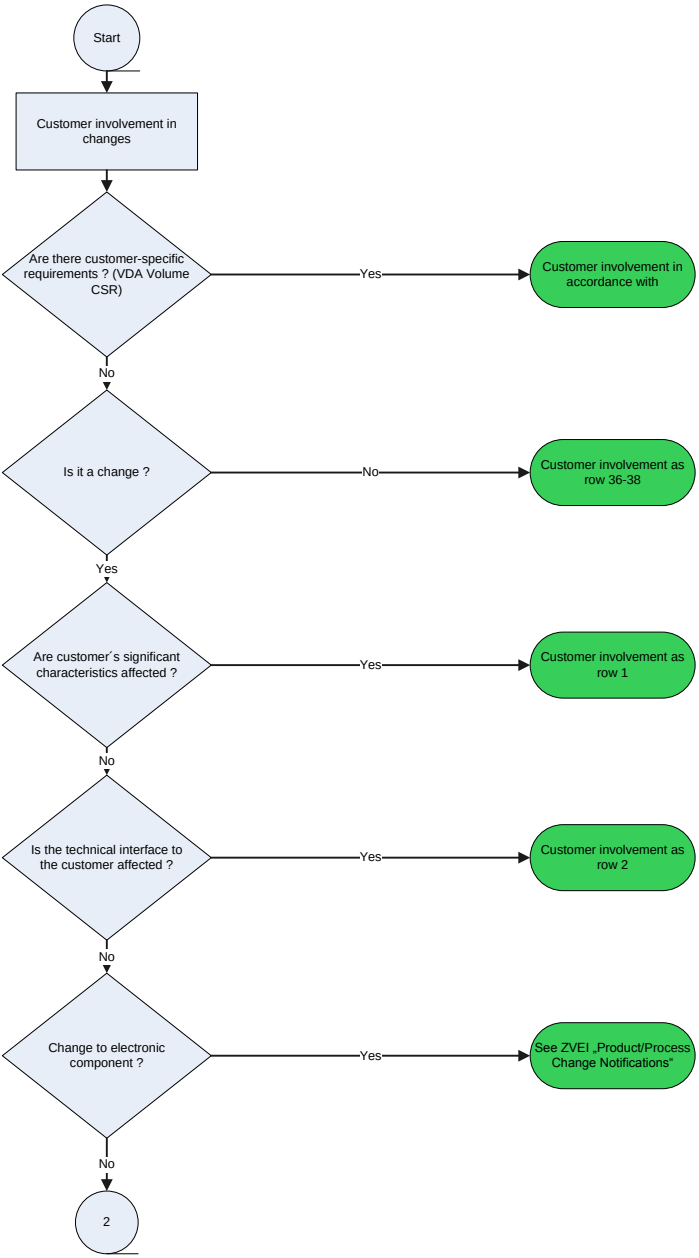
Access data

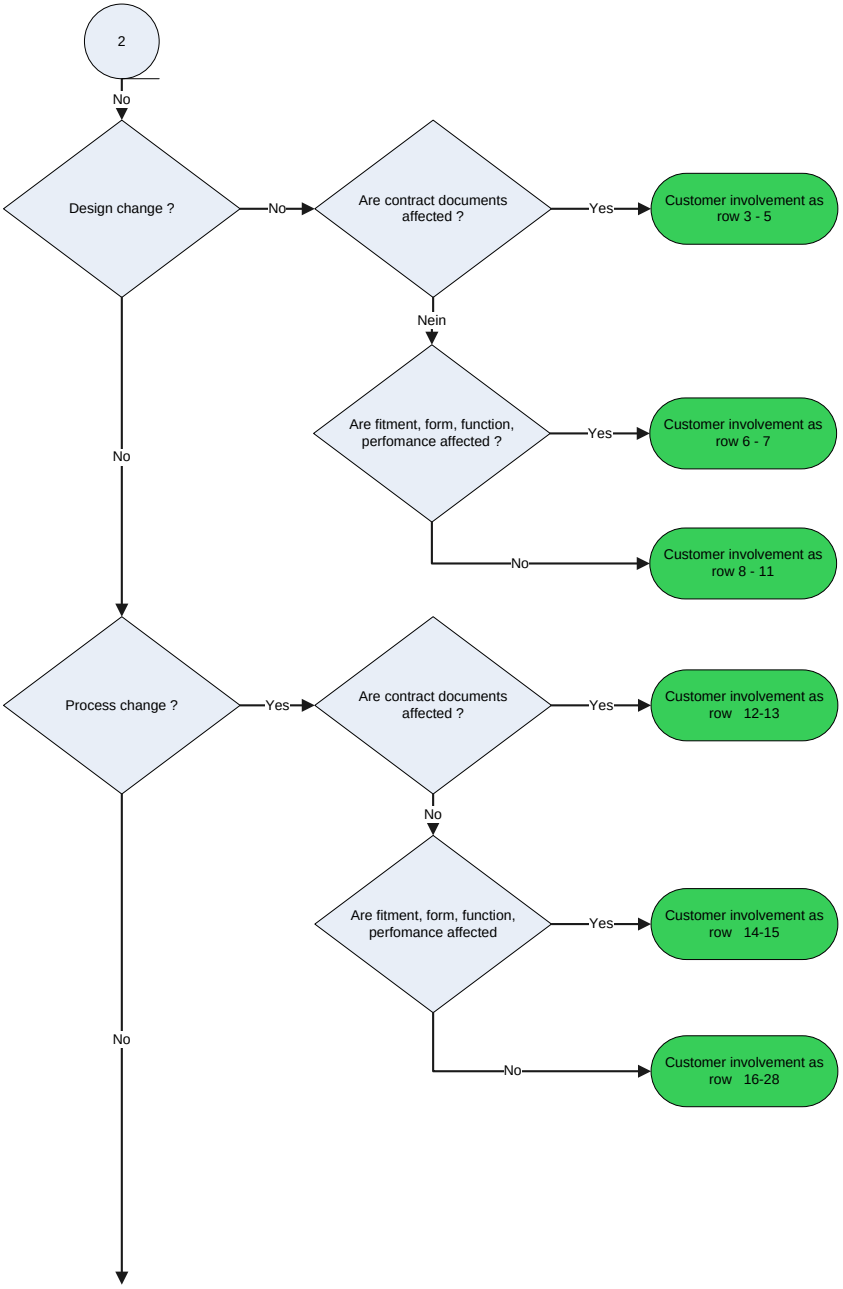
http://www.vdaqmc.de/downloads

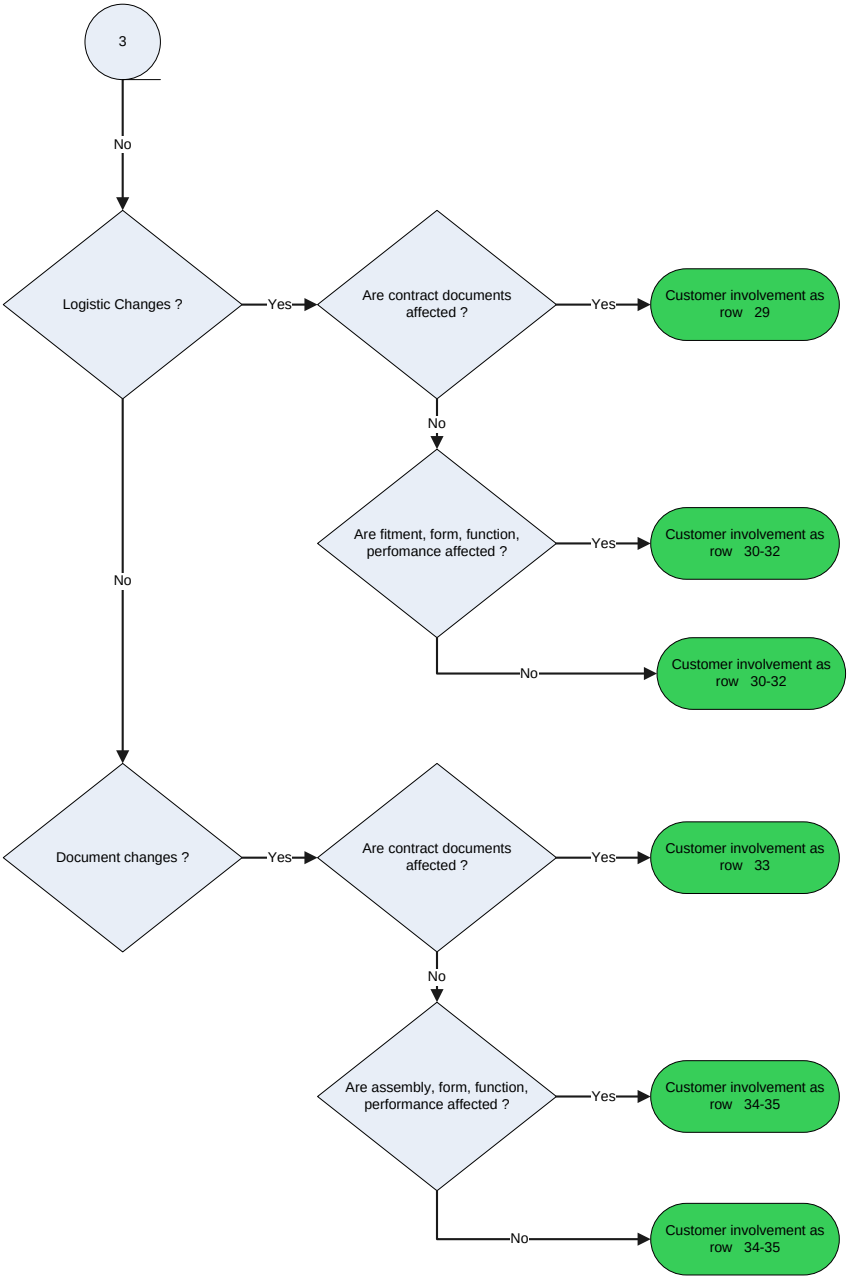
User name: vda2ppf2012

Password: 2012anlagenvda2

Appendix 1 - How to use the trigger matrix







Appendix 2 - Trigger matrix

1) Is it a change?	2) Does it affect customer's significant characteristics?	3) Is the technical interface to the customer affected?	4) Type of change?	5) Does it affect contract documents (e.g., specifications, customer's drawing, data-sets,....? *	6) Are fitment, form, function, performance, reliability affected?			If customer-specific requirements exist, the agreement is obligatory !	Row
y	y	y / n	All	y / n	y / n	Change to significant characteristics agreed with the customer for the product, sub-assy., component (electrical/mechanical), process, ...)?		Z	1
	n	y	All	y / n	y / n	e.g., fixing to the vehicle, electronic parts and/or connections...		Z	2
		n	Electronic components (see ZVEI "Product/Process Change Notifications - Guideline for Automotive Electronic Components")						
			Design Mc **	y	y	e.g., change to design, tooling, ...		Z	3
					n	e.g., change to product software (parameters, architecture)		Z	4
				n	y	e.g., change to sealing material, change to EMC capacitor, ...		Z	5
						e.g., change to a dimension not included in the customer's drawing		Z	6
						Change to materials		Z	7
					n	Change to internal specification or tolerances outside customer's specification		Z	8
						Change to internal specification or tolerances but still within customer's specification		-	9
						Change to identification of parts/materials but with unchanged composition		-	10
						Change in early man'f'ing stages (e.g., pre-drilled dimension for a shaft, wafer location,...)		-	11
			Process Mc	y	y / n	e.g., change in process chain (inc. supplier, duplicated production lines, ..)		Z	12
						e.g., change in checks, checking sequence or other reasons,.....		Z	13
				n	y	e.g., change in hardening parameters, injection temperature, ...		Z	14
						e.g., change in process chain (inc. supplier, duplicated production lines, ..)		Z	15
					n	Prod'n - assembly	Change in no. of cavities in tool, progression tools, incremental tools	I	16
							Duplication of production and checking equipment within an existing line	I	17
							New type of machine obtained and installed	I	18
							Change to an existing tool, new equipment, new Poka Yoke	-	19
							Change to process, inc. early manufacturing stages (e.g., as No. 11)	-	20
							Change to setting parameters, production facilities, injection temperature, ...	-	21
						Testing	Changes in checks, worsened RPN	n p	
							Change to checking method, RPN unchanged/improved, same process	I	23
							Extended checks with no change to method (e.g., larger sample size)	-	24
							Reduction/elimination of check not relevant to the customer (e.g., random sample check)	-	25
						Transfer of production	Tools moved from one line to another; lines are the same	-	26
							Movement of equipment in a production plant with no change to the process chain	-	27
							Location change: equipment, parallel prod'n (not early mfg stages as No. 11)	Z	28
			Logistics	y	y / n	Supplier change, new 2nd supplier, supplier has changed sub-supplier		Z	29
				n	y / n	New carrier or ESP, SLC		I	30
					y / n	Customer packing, shipping, invoicing		Z	31
					y / n	Internal packing (e.g., plant to plant, within the plant,...) and suppliers		-	32
			Doc Mc	y	y / n	Documents adjusted to status of approved/released product		Z	33
				n		Documents adjusted to status of approved/released product or to correct formal defects		-	34
						Change to documents not product-related (e.g., work instructions, ...)		-	35
n	Re-use of tools following 12 or months out of use							Z	36
	Maintenance/overhaul of existing tools/ tools subject to rapid wear (e.g., turning tool, honing tools)							-	37
	Change of compiler version; software tool change affecting customer software (debugger change not relevant here)							-	38

y Yes
n No
np not permitted
- Customer involvement not essential (Note: PPA documents must be archived in-house)
I Customer must be informed - as ISO/TS16949, para. 4.2.3.1 the customer must have 2 weeks to issue findings.
Z Customer agreement required, execution of PPA procedure
Mc Modification
ESP External service provider
SLC Supplier logistics centre (also applies to warehouse)
RPN Risk priority number from Process FMEA
***** or other authorized production documents provided to the customer (e.g., quotation drawing, control plan)

Appendix 3 - Form for a PPA Process planning

Form for PPA Process planning meeting /
Report for planning and agreeing the sampling

Version: | Date: | Replaces version: | Customer signature:

Supplier		Customer	
Name / production location:		Receiving plant:	
Supplier no. with index / DUNS-Code:		If IT system is used: Process No.	
Report no. / index (if known):		Report no. / index (if known)	
Product description :		Product description :	
Part No.:		Part No.:	
Drawing No.:		Drawing No.:	
Drawing issue / date:		Drawing issue / date:	
Common parts / product families:	☐	PPA Process for part variation::	☐
Directed parts:	☐	BMS/BMZ/BMF: Special/significant characteristics (safety, certification, function)	☐

Notes:

Mandatory fields:

General	Technical sampling	Variant sampling
orange	blue	apricot

Optional fields

optional	yellow
distributed sampling	grey

Filling obligation of all specialist departments involved in case of the execution of sampling vote discussions:			
Participants in planning / agreeing the PPA	**Name**	**Dept.**	**Telephone:**
Supplier			
Delivery scheduling			
Quality management			
Development			
Production (installability)			
Materials technology			
Measurement technology			
...			
...			
...			

☐ Production process and product release

☐ PPA Process

- ☐ New parts
- ☐ Product modification
- ☐ Production process modification
- ☐ Reapproval of PPA Process
- ☐ Modification in the supply chain
- ☐ Long-term production stop (more than 12 month)

☐ Report covering other samples

☐ Stepped PPA Process (please agree below, state the dates for the individual submissions and plan the documents required for each submission)

Reason for the stepped PPA Process:

Confirmation by the supplier:

Considering the approved features the presented samples have been entirely manufactured with series equipment and under series conditions at the series production site or in case of "other samples" according to the agreement between supplier and customer specialist department (see attachment). Concerning these features there aren't any changes known, respectivily planned. The results achieved in our tests and in the sample release procedure can be assumed in further sample releases.
In case of nevertheless necessary changes in part and / or process, changes will be announced by the supplier in a new sample release.

Name:		Comments:
Dept.:		
Telephone:		
Fax:		
E-mail:		
Date:		Signature:

Confirmation of procedure for stepped PPA Process, by the customer's quality management department for supplier parts

Name:		Comments:
Dept.:		
Tel..:		
Fax:		
E-mail:		
Date:		Signature:

PPA Process date (technical):		**Stepped PPA Process:**	Step 1:		Step 2:		Step 3:		Step 4:				
PPA Process date (colour):		Attach list if relevant								**Jointly agreed completion date:**			

No.	Requirements (characteristics as specification)	Submission level				Technical samples / report	Steps of distributed sampling				PPA Process for parts variation	Notes
		0 ☐	1 ☐	2 ☐	3 ☐		1	2	3	4		
	Cover sheet to PPA report	V	V	V	V	✔	✔	✔	✔	✔	✔	
1	Test results (e.g., geometry, dimensions, function, material (strength, physical characteristics, ...), weight, haptics, acoustics, odour, appearance, surface, reliability, ESD test, electrical safety)	D	D	V	V							
	Dimensional checks Parts per nest / form: 5											
	Raw part measurement					☐	☐	☐	☐	☐		
	Single component measurement					☐	☐	☐	☐	☐		
	Standard measurement report (all drawing details)					☐	☐	☐	☐	☐	☐	
	Standard gauge report					☐	☐	☐	☐	☐	☐	
	3D data-set measurement					☐	☐	☐	☐	☐		
	Cross sections / cut					☐	☐	☐	☐	☐		
	Others					☐	☐	☐	☐	☐	☐	

	Material testing											
	Evidence of compliance with customer's standards (requirements)					☐	☐	☐	☐	☐	☐	
	Sample extraction plan					☐	☐	☐	☐	☐	☐	
	Metallography					☐	☐	☐	☐	☐		
	Chemical analyses					☐	☐	☐	☐	☐	☐	
	Approval single components					☐	☐	☐	☐	☐		
	Approval operatings equipment					☐	☐	☐	☐	☐	☐	
	Mechanical characteristics					☐	☐	☐	☐	☐	☐	
	Approval raw parts					☐	☐	☐	☐	☐		
	Corrosion test					☐	☐	☐	☐	☐	☐	
	Odour test					☐	☐	☐	☐	☐	☐	
	Haptic test					☐	☐	☐	☐	☐	☐	
	Surface test					☐	☐	☐	☐	☐	☐	
	Colour measurement and visual self evaluation					☐	☐	☐	☐	☐	☐	
	Colour-specific characteristics (material, etc.)						☐	☐	☐	☐	☐	
	Function tests according to component specifications / functional requirements					☐	☐	☐	☐	☐	☐	
	Reliability test					☐	☐	☐	☐	☐		
	Acoustic test					☐	☐	☐	☐	☐		
	ESD tests					☐	☐	☐	☐	☐		
	Weight					☐	☐	☐	☐	☐	☐	
	Transport equipment					☐	☐	☐	☐	☐		
	Others					☐	☐	☐	☐	☐	☐	

2	Samples (quantity supplied by agreement) Samples retained for reference	D	V	V	V	5 ☐	5 ☐	5 ☐	5 ☐	5 ☐	2 ☐	
3	Technical specifications (e.g., customer's drawings, CAD data, specifications, approved design modifications, resistance to short-circuits , voltage resistance, functional safety management (FSM)) Approved customer drawing	D	D	V	V	☐	☐	☐	☐	☐	☐	
4	**Product FMEA**	D	D	D	D	☐	☐	☐	☐	☐		
5	Design & development approval by supplier in case of development responsibility	D	D	V	V	☐	☐	☐	☐	☐	☐	
6	Confirmation of compliance with legal requirements (e.g., environment, safety, recycling, national certificates)	na	V	V	V	✔	✔	✔	✔	✔	✔	
7	**Material data sheet** per IMDS	V	V	V	V	✔	✔	✔	✔	✔	✔	
8	**Software test report**	D	V	V	V	☐	☐	☐	☐	☐	☐	
9	**Process FMEA**	D	D	D	D	☐	☐	☐	☐	☐		
10	**Process flow chart (production and test/inspection operations)**	D	D	D	V	☐	☐	☐	☐	☐		
11	**Control plan**	D	D	D	D	☐	☐	☐	☐	☐		
12	**Confirmation of process capability**	D	D	V	V	☐	☐	☐	☐	☐	☐	
13	**Evidence of compliance with special characteristics**	na	na	V	V	☐	☐	☐	☐	☐	☐	
14	**List of test/inspection equipment** (product-specific) Test/measurement reports and test reports for gauges	D	D	D	V	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	
15	**Capability study testing equipment, if appropriate (result)**	D	D	D	D	☐	☐	☐	☐	☐	☐	
16	**Tooling list (with quantity/number of cavities and information on the tooling concept)**	D	D	V	V	☐	☐	☐	☐	☐		

17	**Confirmation of achievement of the agreed capacity (process validation)**	D	D	V	V	☐	☐	☐	☐	☐	☐	
18	**Written self-assessment of the criteria** as per the evaluation matrix for production maturity of product and process (Attachment 4)	D	D	V	V	☐	☐	☐	☐	☐	☐	
19	**Part history**	D	V	V	V	✔	✔	✔	✔	✔	✔	
20	**Confirmation of suitability of the product carrying units, incl. storage**	D	D	V	V	☐	☐	☐	☐	☐	☐	
21	**PPA status of the supply chain (purchased parts, directed parts and in-house parts)**	D	D	V	V	☐	☐	☐	☐	☐	☐	
22	**Approval of coating systems to customer's requirements**	D	D	V	V	☐	☐	☐	☐	☐	☐	

D = execution, documentation & archiving at supplier (if appropriate, for inspection by the customer) ; V = for submission at the customer

Appendant documents:

- ☐ Customer's technical documents
- ☐ Zone specification for optical assessment
- ☐ Specify limit samples
- ☐ Specify porosity classes
- ☐ Acceptance guidelines
- ☐ Test/inspection regulations
- ☐ Standards
- ☐ List with timing dates for PPA Process for parts variations
- ☐ Others

Reasons in case of non-conformance

Note:

In the case of non-conformances the supplier must first obtain a written permission (deviation permit) from the customer and attach this to the PPA report. The signed form must be submitted as an attachment to the PPA report.

This completed form and if necessary any other appendix must be attached to the PPA report under point "Other document".

Necessary tests at the customer:

It must be ensured that all submitted documents will be evaluated property.

Technical check	Quantity of samples	Duration in working days	Technical samples	Steps of distributed sampling				PPA Process for part variation	Part number*	Contact person in customer' organisation
				1	2	3	4			
Dimensions			☐	☐	☐	☐	☐	☐		
Function			☐	☐	☐	☐	☐	☐		
Fitting			☐	☐	☐	☐	☐	☐		
Material			☐	☐	☐	☐	☐	☐		
Corrosion (to be ordered separately)			☐	☐	☐	☐	☐	☐		
Paint technology			☐	☐	☐	☐	☐	☐		
Colour			☐	☐	☐	☐	☐	☐		
Surface; grain finish			☐	☐	☐	☐	☐	☐		
Process			☐	☐	☐	☐	☐	☐		
			☐	☐	☐	☐	☐	☐		
			☐	☐	☐	☐	☐	☐		
			☐	☐	☐	☐	☐	☐		

* to be filled for common parts / product families

Comments / miscellaneous

Appendix 4 - Matrix for assessing the serial production maturity of product and process

Assessment : Product

Part No.:		Description:	
Supplier:		Colour:	

Design level:

Presented:		Current:	

For electronic components:

Hardware level:		Software level:	
Diagnosis level:			

	OK (green)	Conditionally OK (yellow)	NOK (red)
Tools	**Production tool** accepted ☐	**Production tool** improved/corrected ☐	**No production tool** ☐
Dimensions	**Dimensionally OK** no rework ☐	**Dimensionally OK** with rework by supplier or non-critical dimensions NOK (deviation permit is available) ☐	**Dimensionally NOK** ☐
Surface Structure Colour/grain finish	**OK** no sink marks no corrugation ☐	**Just acceptable** complies with boundary sample ☐	**Significant non-conformance / defect** not suitable for assessment ☐
Material	**Production material** Customer's specification met ☐	**No production material or different processing or customer's specification not met** Deviation permit available; material data sheet (IMDS) is not available or incomplete ☐	**No production material** Customer's specification not met / demonstrated ☐
Installability	**Can be installed** without extra work ☐	**Can be installed** with extra work ☐	**Cannot be installed** ☐
Function	**Function satisfied** complies with specification ☐	**Minor deviation from specification** ☐	**Function NOK or not demonstrated;** specification not met ☐
Purchased parts	**Released** ☐	**Conditionally released** ☐	**Rejected or not yet submitted as samples** ☐

Overall result:

Date

Signature supplier

Assessment : production process

Part No.: Description:

Supplier: Colour:

Design level:

Presented: Current:

For electronic components:

Hardware level: Software level:

Diagnosis level:

	OK (green)	Conditionally OK (yellow)	NOK (red)
Machines Plant Equipment	**Production at production location** - acceptance checked by supplier, capability demonstrated	**Production at production location** No quality problems expected in production	**Production not at production location** or quality problems to be expected
Tools	**Production tool** released	**Production tool** improvement	**No production tool**
Chaining / Logistics	**Series**	**No series** But no quality deficiencies expected	**Quality deficiencies to be expected**
Cycle time / quantity	**Production cycle time** No special actions	**Production cycle time** Permanently achievable with special actions	**Production cycle time** Not achievable with special actions
	All production tools / cavities checked / released	**At least one set of series production tool approved**	**No production tools**
	All production lines checked / released	**One production line** checked / released	**No production line**
Personnel	**All production personnel** trained Complete work & inspection instructions available	**Selected production personnel** trained Complete work & inspection instructions available	**No production personnel** Work & inspection instructions incomplete
Process capability (if 100% inspection is not planned)	**Agreed capability fully achieved**	**Agreed capability not achieved** 100% inspection introduced	**Capability not demonstrated** No 100% inspection
Test/inspection equipment	**All present, checked and accepted** Capability demonstrated	**Only partially present, checked and accepted** Substitute equipment available	**Not present** or not checked and accepted

Overall result:

Date Signature supplier

Cover sheet

Sender **Recipient**

☐ **Production process and product approval report**
☐ **Report covering other samples**
☐ Sample submission
☐ New parts
☐ Product modification:
☐ Production process modification:

Submission level: _____
☐ Reapproval of PPA Process
☐ Long-term production stop (more than 12 months)
☐ Modification in the supply chain

Attachments / items for inspection

Product / Process

☐ 1.1 Geometry, dimension check	☐ 1.9 ESD test	☐ 8 Software test report	☐ 16 Tooling list
☐ 1.2 Function check	☐ 1.10 Reliability tests	☐ 9 Process FMEA	☐ 17 Confirmation of agreed capacity
☐ 1.3 Material check	☐ 2 Samples	☐ 10 Process flow chart	☐ 18 Written self-assessment
☐ 1.4 Haptic check	☐ 3 Technical specifications	☐ 11 Control plan	☐ 19 Part history
☐ 1.5 Acoustics check	☐ 4 Product FMEA	☐ 12 Confirmation of process capability	☐ 20 Confirmation of suitability of transport equipment
☐ 1.6 Odour check	☐ 5 Design release	☐ 13 Achievement of special characteristics	☐ 21 PPA status of the supply chain
☐ 1.7 Appearance check	☐ 6 Compliance with legal requirements	☐ 14 Test/inspection equipment list	☐ 22 Approval of coating systems
☐ 1.8 Surface check	☐ 7 Material data sheet / IMDS	☐ 15 Capability study testing equipment	☐ 23 Others

Supplier details

Supplier/production location:	Ident. No. / DUNS:	Customer:
Part description:	Delivery note no.:	Report No.: Index:
Part No.:	Quantity supplied:	Goods Inwards No. / date:
Drawing No.:	Batch No.:	Order schedule no. / date:
Issue / date:	Weight of sample:	Unloading point:

Confirmation by supplier – It is hereby confirmed that the sample submission has been carried out in accordance with the agreed submission level to VDA volume 2

Name: Telephone: ☐ The IMDS data-set has been drawn up under IMDS ID-No.:
Dept.: Fax / E-mail:

Comments: Date: Signature:

Customer's decision

	Approval			Product / Process																													
	Overall	Overall process	Overall product	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
OK	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Conditionally OK – follow-on submission required	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
NOK – Reapproval of PPA Process is required	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Deviation approval no.	Valid until	Quantity	Date of reapproval PPA Process	If returned: delivery note no. & date:

Name: Telephone:
Dept.: Fax / E-mail:

Comments: Date Signature

Distribution:	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Supplier / production location	Customer
Ref. No. DUNS code:	**Ref. No.:**
Report No.: Index:	Report No.: Index: to be completed by the customer
Title: Part No.:	Drawing No.: Index/date:

Appendix	Issue level/ date	Type, extent and identification of the appendix
☐ 1.1 Geometry, dimensional check		
☐ 1.2 Function check		
☐ 1.3 Material check		
☐ 1.4 Haptic check		
☐ 1.5 Acoustics check		
☐ 1.6 Odour check		
☐ 1.7 Appearance check		
☐ 1.8 Surface check		
☐ 1.9 ESD test		
☐ 1.10 Reliability tests		
☐ 2 Samples		
☐ 3 Technical specifications		
☐ 4 Product FMEA		
☐ 5 Design release		
☐ 6 Compliance with legal requirements		
☐ 7 Material data sheet / IMDS		
☐ 8 Software test report		
☐ 9 Process FMEA		
☐ 10 Process flow diagram		
☐ 11 Control plan		
☐ 12 Confirmation of process capability		
☐ 13 Achievement of special characteristics		
☐ 14 Test/ Inspection equipment list		
☐ 15 Capability study testing equipment		
☐ 16 Tooling list		
☐ 17 Confirmation of agreed capacity		
☐ 18 Written self-assessment		
☐ 19 Part history		
☐ 20 Confirmation of suitability of transport equipment		
☐ 21 PPA status of the supply chain		
☐ 22 Approval of coating systems		
☐ 23 Others		
Comments by supplier:		
Name: Dept.: Telephone: Fax: E-mail: Date: Signed:		

Product-related test results

Issue: ___ / Date: _____

Sheet ___of _____

☐ 1.1 Geometry; dimensional checks	☐ 1.9 ESD test
☐ 1.2 Function checks	☐ 1.10 Reliability checks
☐ 1.3 Material checks	☐ 2 Samples
☐ 1.4 Haptic checks	☐ 3 Technical specifications
☐ 1.5 Acoustics checks	☐ 4 Product FMEA
☐ 1.6 Odour checks	☐ 5 Design release
☐ 1.7 Appearance checks	☐ 6 Compliance with legal requirements
☐ 1.8 Surface checks	☐ 7 Material data sheet / IMDS

Supplier / production location:	**Customer:**
ID No. / DUNS code:	ID No.:
Report No.: Index:	Report No.: Index: to be completed by customer
Description: Part No.: Drawing No.: Issue level/date:	Description: Part No.: Drawing No.: Issue level/date:

Ref. No.	Requirements Specifications	Measured data (supplier)	Specification satisfied? Yes	No	Comments:
			☐	☐	
			☐	☐	
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Confirmation by supplier: Comments:	**Decision by customer:**	
	Released	☐
	Rejected; reapproval of PPA Process is required	☐
	Comments:	
Name: Dept.: Telephone: Fax: E-mail: Date: Signed:	Name: Dept.: Telephone: Fax: E-mail: Date: Signed:	

Process-related and other documents

Issue: ___ / Date: _____

Sheet ___of _____

☐ 8 Software test report	☐ 16 Tooling list
☐ 9 Process FMEA	☐ 17 Confirmation of agreed capacity
☐ 10 Process flow chart	☐ 18 Written self-assessment
☐ 11 Control plan	☐ 19 Part history
☐ 12 Confirmation of process capability	☐ 20 Confirmation of suitability of transport equipment
☐ 13 Achievement of special characteristics	☐ 21 PPA status of the supply chain
☐ 14 Test/inspection equipment list	☐ 22 Approval for coating systems
☐ 15 Capability study testing equipment	☐ 23 Others

Supplier / production location:	**Customer:**
ID No. / DUNS code:	ID No.:
Report No.: Index:	Report No.: Index: to be completed by customer
Description: Part No.: Drawing No.: Issue level/date:	Description: Part No.: Drawing No.: Issue level/date:

Confirmation by supplier:	**Decision by customer:**	
Comments:	Released	☐
	Rejected; reapproval of PPA Process is required	☐
	Comments:	
Name: Dept.: Telephone: Fax: E-mail: Date: Signed:	Name: Dept.: Telephone: Fax: E-mail: Date: Signed:	

Appendix 6 – Software test report

Sender:	**Software Test Report**	Date of issue:
Recipient:	**Appendix to the PPA report**	

Part No.[1]:	Drawing and geometry status (ZGS):

	Company	Dept.	Name	Telephone	Signature
Produced by:					
Approved by[2]:					

Software description[3] :

This software replaces the following part nos.:

Reason for the software test report	
Main release	
Change release	
Repeat release (Bugfix)	

Changes compared to previous software[4]:

Configuration details[5]:

Part No.	Hardware version	Software version	Diagnosis ident.	Security class
Order No.				
Hardware part no.	YY/WW	YY/WW_Patchlevel		
Software part no. 1		YY/WW_Patchlevel		
Software part no. 2		YY/WW_Patchlevel		
Software part no. 3		YY/WW_Patchlevel		
Software part no.4		YY/WW_Patchlevel		

Release:

Date | Signature

Part No.	Software Test Report Appendix to PPA report
ZGS:	

Sheet 2 : Tests completed

General hardware and software details			
Microcontroller	1.	2.	3.
Microcontroller frequency	1.	2.	3.
Quartz frequency	1.	2.	3.
Operating system			

Memory capacity utilization					
Component	Used	Available	Used [%]	Specified	Status
ROM					
RAM					
EEPROM					
Hard disk					

Compatibility[6]						
On which hardware (part no.) if is possible to flash the software (part no.)?	HW Version	HW Version	HW Version	HW Version	HW Version	HW Version

Function tests[7]		
Tested according to test specification		
All test sequences successful?	Yes	No
Which test sequence was not successful?	1)	
	2)	
	3)	
	4)	
	5)	
	6)	
Which measure have been defined?		
When is the next bugfixing release?		

Signature

Part No.	Software Test Report Appendix to PPA report
ZGS:	

Sheet 3 : Confirmation of software tests

Herewith we confirm the performance of the following tests and the correctness of their results:

Software integration test			
Performed	yes	no	
Version	xxxxxxxx		
Result	successful	not successful	
Number of points outstanding	xxxxxxxx		

Module test			
Performed	yes	no	
Version	xxxxxxxx		
Result	successful	not successful	
Number of points outstanding	xxxxxxxx		
System integration test			
Performed	yes	no	
Version	xxxxxxxx		
Result	successful	not successful	
Number of points outstanding	xxxxxxxx		
Software in the loop (SIL)			
Performed	yes	no	
Version	xxxxxxxx		
Result	successful	not successful	
Number of points outstanding	xxxxxxxx		
Acceptance test			
Completed	yes	no	
Version	xxxxxxxx		
Result	successful	not successful	
Number of points outstanding	xxxxxxxx		

Approval:

Date

Signature

Appendix 7 – Comparison between PPA and PPAP (1/2

	PPA (contents)	versus [PPAP No]
	Cover sheet to PPA report	(18)
1	Test results (e.g. geometry, dimensions, function, materials [strength physical characteristics], weight, haptics, acoustics, odour, appearance, surface, reliability ESD tests, electrical safety, etc.)	(9), (10), (13)
2	Samples (quantity supplied by agreement)	(14)
3	Technical specifications (e.g. customer drawings, CAD data, specifications, approved design modifications, resistance to short-circuit , voltage reliability, functional safety management (FSM))	(1), (2)
4	Product FMEA	(4)
5	Design and development approval by the supplier in case of development responsibility	(1), (3)
6	Confirmation of compliance with legal requirements (e.g. environment, safety, recycling, national certificates)	(17)
7	Material data sheet (per IMDS)	(10)
8	Software test report	No equivalent
9	Process FMEA	(6)
10	Process flow chart(production and test/inspection operations)	(5)
11	Control plan	(7)
12	Confirmation of process capability	(11)
13	Evidence of compliance with special characteristics	(17)
14	List of test/inspection equipment (product -specific)	(16)
15	Capability study testing equipment, if appropriate (result)	(8), (11), (16)
16	Tooling list (with quantity /number of cavities and information on tooling concept)	No equivalent
17	Confirmation of achievement of agreed capacity (process validation)	No equivalent
18	Written self-assessment of criteria as per evaluation matrix for production maturity for product and process	No equivalent
19	Part history	(2)
20	Confirmation of suitability of the product carrying units , including storage	No equivalent
21	PPA status of the supply chain (purchased parts, directed parts and in-house parts)	No equivalent
22	Approval of coating systems in accordance with customer requirements	No equivalent

PPAP (12) & (15) not incl. in PPA

PPAP (contents) 4th edition	
(1)	Design Records
(2)	Engineering Change Documents
(3)	Customer Engineering Approval
(4)	Design Failure Mode and Effects Analysis
(5)	Process Flow Diagrams
(6)	Process Failure Mode and Effects Analysis (P-FMEA)
(7)	Control Plan
(8)	Measurement System Analysis Studies
(9)	Dimensional Results
(10)	Records of Material / Performance Test Results
(11)	Initial Process Studies
(12)	Qualified Laboratory Documentation
(13)	Appearance Approval Report
(14)	Sample Production Parts
(15)	Master Sample
(16)	Checking Aids
(17)	Customer-specific Requirements
(18)	Part Submission Warrant (PSW)

PPAP Level	
Level 1:	Only the part submission warrant (PSW) is submitted to the customer
Level 2:	The part submission warrant (PSW) with samples and restricted supporting data are submitted to the customer
Level 3:	The part submission warrant (PSW) with samples and full supporting data are submitted to the customer
Level 4:	The part submission warrant (PSW) and other requirements as specified by the customer
Level 5:	The part submission warrant (PSW)) with sample parts and complete supporting data are available for assessment at the supplier's production location

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