

# Guideline for Approving Vendor Parts

Revision version 2a of April 2005

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## **Validity:**

This guideline applies for all ebm-papst vendor parts.

For ebm-papst Mulfingen part numbers the format nnnnn-n-nnnn (n=numeral) applies.

For ebm-papst St. Georgen part numbers the format nnnnnnnnnn (n=numeral) applies.

Deviations from this guideline specific to groups of goods require an explicit agreement with the Vendor Parts Quality Assurance department of ebm-papst.

This guideline was been approved and put into force,

Mulfingen, on Oct 08, 2003.

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## Introduction

The approval process described here is based on the requirements of ISO/TS 16949 whereby a process which is recognized by the automotive industry must be observed for the product- and production-process-specific approval also of vendor parts. The process described here is therefore oriented to the PPAP process of QA9000. The designation of the same name is used in order to emphasize this orientation without claiming total agreement.

## Purpose

The production part approval process (PPAP) of ebm-papst defines basic requirements for the production part approval including production materials and process-engineering products (refer to Appendix).

The purpose of the production part approval process (PPAP) is to determine whether all the design documents and specification requirements have been implemented correctly by the supplier and whether the production is able to manufacture products which fulfill these requirements during an actual production run.

## Applicability

This chapter describes the production part approval process for suppliers of ebm-papst. It corresponds more or less to the approval process described in the PPAP reference manual of the QA-9000 and describes the general requirements with regard to the product part approval for production parts, production material and process-engineering products.

Ebm-papst suppliers of standardized catalog products must fulfill PPAP, unless ebm-papst waives the fulfillment. The required scope of submission of the PPAP is defined by the "Checklist approval of Vendor Parts" of ebm-papst, and is issued parts-specifically as part of the purchase order by the buying department. In the case of modifications listed by the supplier the corresponding submission documents have to be submitted for the approval decision by ebm-papst. In case of doubt the scope has to be agreed with ebm-papst.

## General remarks

The supplier receives the approval decision of the buying department or the quality assurance for vendor parts at ebm-papst. To this purpose the documents and samples in accordance with the "Checklist Approval of Vendor Parts" have to be submitted for the parts class specified by ebm-papst in the following cases:

- New part or product for the supplier
- After a deviation has been eliminated at a part which had been submitted and found not to comply in a previous approval procedure (subsequent sampling)
- After modification of products due to a change in the design with an effect on drawings (modification of specifications or materials)
- After a change in the production process\*
- After a production move\*
- In case of new subsuppliers\*, in as far as these are producers or finishing plants

Further information can be found in the *chapter "Customer notification and submission requirements of the PPAP reference manual of the QA-9000*.

\* In as far as these can affect the applicability, function, durability and ability to be finished. In cases of doubt the supplier has to clarify this through the ebm-papst buying department.

### Remark

If questions arise with regard to the necessity of an approval for serial parts, please contact the person responsible in the buying department of quality assurance of ebm-papst.

## Representative production run

The serial parts must have been manufactured at the production site in series, with the corresponding tools, the gauges, the processes (feeds, speeds, cycle times, pressures, temperatures, etc.), the materials and the personnel from the manufacturing area.

## Production Part Approval Process (PPAP)

Approval for New Parts and Product/Process Modifications  
Guideline for Vendor Parts

The serial parts must originate from the parts based on the PPAP and be of a representative production run. This production run encompasses a specific production quantity of at least 100 consecutively manufactured parts, unless a different quantity was agreed in writing with the person responsible at ebm-papst. Parts of every item of a multiple casting mold, of a multiple forging die, of a multiple form, of a multiple tool or of a multiple tool have to be measured and representative parts have to be tested.

The following applies for process-engineering products, also called bulk materials here:

No specific number of "parts" are required. If a sample is required for submission, it must be taken in such a manner that it is ensured that it represents the current state of the process sequence.

Process-engineering products include:

*Bulk goods and continuous goods are: Adhesives and sealants (soldering fluxes, elastomers), chemicals (flushing agents, paints/pigments, solvents), coating materials (phosphates, surface treatment materials), foils and laminates, ferrous and non-ferrous metals (crude steel, aluminum, coils, bars), lubricants (oils, greases, etc.), monomers, prepolymers and polymers (rubbers, plastics, resins and their preliminary materials).*

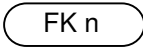
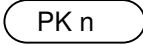
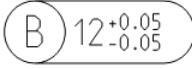
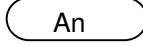
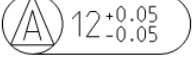
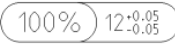

### Customer notification and submission requirements

The supplier must inform the sector responsible for approvals at ebm-papst about every design and process modification, which can influence function, following process steps and given accreditations or approvals (eg. VDE, UL, CSA etc.) as well as legal requirements. In case of doubt this has to agree with ebm-papst.

The basis for the agreement are the requirements and examples of QS 9000 (PPAP chapter 1.3 Customer Notification).

### Special characteristics

The characteristics important for the interfaces to ebm-papst are identified as "function-specific / function-relevant characteristics" or process-critical characteristics" in the specification and are based on the FMEA results of ebm-papst. "Special characteristics" and "verify characteristics" are furthermore identified company-specifically in the ebm-papst specification as follows.

ebm-papst St. Georgen	ebm-papst Mulfingen	Characteristic type
 		<b>Special characteristic:</b> Marking of characteristics a process capability studie as well as a measurement system (MSA) analyse has to been prove. FK n: Function-critical-characteristic PK n: Process-critical-characteristic
		<b>A – characteristics</b> are characteristics with a compulsory archiving (statutory requirements or critical with regard to safety).
		<b>Verify characteristics</b>
		<b>100% inspection:</b> The compliance with the tolerances in the specification has to assure with a 100% inspection. A measurement study is needed.
		<b>Minimum-process-capability</b> Characteristic with a process-capability of at least 1.x

## Production Part Approval Process (PPAP)

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		<b>Continuous sample</b> A continuous and periodical inspection during production of the marked characteristic. The sample size and the sample frequency as well as the measurement equipment has to mention in the Control Plan and in the inspection plan respectively.
		<b>Inspection criteria</b> This characteristics has to inspect during each systematically disposed inspection, at least 1 times per cavity.

### Parts classes

The parts class determines the extent of the documents which are to be submitted for the approval decision at ebm/Papst. The parts classes are specified by ebm-papst and are divided into four parts classes.

ebm-papst reserves the right to change the specification of the parts classes at any time. If the parts class is changed subsequently, the supplier is informed in writing by the buying department of ebm-papst. All the requirements with regard to the production part approval (PPAP) form part of the purchase contract with the supplier. The supplier must submit the relevant documents to ebm-papst in accordance with the "Checklist Approval of Vendor Parts". If not specified otherwise by ebm-papst, the supplier must keep all the documents relevant to PPAP as long as the part is active plus at last one calendar, however at least 15 years. This requirement does not, however, replace statutory requirements. If the supplier does not know the period in which the part is active, the last date of delivery plus 15 years applies, in as far as legislation or further customer requirements do not require longer periods.

### Records with regard to the production part approval

The supplier must ensure that the corresponding PPAP records of a replaced part are contained in the PPAP records of a new part, or that a corresponding reference to them is made.

#### 1. ebm-papst specification

The submission documents named below are to be submitted in a unified folder and to be structured in accordance with the "Checklist Approval of Vendor Parts". The "Checklist Approval of Vendor Parts" should serve as the table of contents. The date on which the supplier signs the "Checklist Approval of Vendor Parts" counts as the date of creation of the PPAP process. Any later supplements are to be carried out chapter-by-chapter and to be documented on a further checklist. Obsolete submitted documents are to be marked clearly as obsolete, but not to be removed from the folder.

The supplier must be in possession of all the design records for the sellable product including the design records for components or parts of this sellable product and to be submitted in copy. Every characteristic is to be numbered uniquely and continuously in order to ensure the unique reference to the proofs. In case of any later supplements/modifications it must be ensured that the numbering sequence is retained.

- 1.1 If the design records such as CAD/CAM calculation data, parts drawings or specifications, exist in an electronic data format, for example as computer-based data, the supplier must make a print-out in order to prove the measurements to be carried out.
- 1.2 Irrespective of the design responsibility for the product, only one valid design record which has been approved by ebm-papst exists for each sellable product, each part or each component. The design record can refer to other documents and thus make these part of the design record. The design record becomes unique through the modification index.

#### 2. Documents which describe the modification

- 2.1 The supplier must be able to produce in writing all the design changes agreed with ebm-papst which have not yet been included in the design documents, but have already been included into the product,

part or tool. These also include the notes of talks, telephone notes with statement of the talk partners, talk data and clear reference to the part number.

- 2.2 Modification wishes of the supplier can also be submitted here, but do not replace the information in the corrective action plan. These modification wishes are to be agreed with the persons responsible at ebm-papst beforehand. The reference to this agreement (talk partners, date, etc.) is to be cited.

### 3. Proof of the technical approval by ebm-papst

- 3.1 If the design records name the materials, coatings, additives, etc. under specification of the source (e.g. manufacturer, pre-supplier), the supplier must supply proof of the technical approval by ebm-papst.
- 3.2 The use of the approved source is to be confirmed.

### 4. Design FMEA

- 4.1 The supplier must be able to produce a design FMEA for the parts or materials for which he has the design responsibility, if this is expressly required in the "Checklist Approval for Vendor Parts PPAP. Instructions for FMEA are contained in QA 9000 (Ref. Man. FMEA) or VDA Volume 4 Part 2.
- 4.2 The RPZ evaluation guideline of the ebm-papst Mulfingen serves as orientation for the suitable evaluations levels of the RPZ determination (see appendix).
- 4.3 The interface to the FMEA of ebm-papst must be taken into consideration by the supplier. For further information please contact the responsible development department of ebm-papst.

## **5. Process flow diagram**

- 5.1 The supplier must be able to produce a process flow diagram created in the supplier-specific format. This must describe the steps and the sequence of the process to an adequate extent. Further information can be found in the reference manual "Advanced Product Quality Planning and Control Plan (APQP)" of the QA 9000.
- 5.2 Process flow diagrams for "families" of similar parts are acceptable if the new parts were checked for conformance. A process flow diagram for example contains process steps, test steps, transportation, intermediate and final storage. The representation must clearly show the sequence of the individual process steps from the goods acceptance to the delivery. If appropriate, the change of production sites is to be identified within the process chain. If the represented process sequence refers to part families or part variants, the varied process steps are to be identified clearly.

## **6. Process FMEA**

- 6.1 The supplier must be able to produce a process FMEA for the parts or materials, if this is required in the "Checklist Approval for Vendor Parts". Instructions for FMEA are contained in QA 9000 (Ref. Man. FMEA) or VDA Volume 4 Part 2. The RPZ evaluation guideline of the ebm-papst is recommended as orientation for the suitable evaluations levels of the RPZ determination.
- 6.2 An individual process FMEA can refer to a process through which a family of similar parts or materials is manufactured. The process FMEA for "families" of similar parts is acceptable if the new parts were checked for conformance. Any complaints brought for parts of this part family have to be evaluated and to be taken into consideration.

## **7. Measuring record results**

- 7.1 The supplier must provide the proof that verifications of measurements were carried out in accordance with the requirements of the design records and the control plan and that the results conform to the specified requirements. The supplier must record measuring results for each individual manufacturing process, e.g. production stations or lines and all the nests, forging dies, models or casting molds.
- 7.2 The supplier must list the valid revision version of the design record and of each approved technical revision document which has not yet been entered in the applicable design record of the manufactured part.
- 7.3 The supplier must measure at least one part per nest/track/station and document the results in the measuring record. The supplier must mark the parts under specification of the production stations, nests, tracks, forging dies, etc. and supply these as well (also refer to Chapter "16. Sample parts, Page 12).
- 7.4 The supplier must note the revision version, the drawing date, the supplier name and the part number on all the supplementary documents (e.g. results of measurements with coordinate inspection machines, data sheets with tolerances of form and position or copies of other supplementary drawings which are used in connection with the parts drawings). If an optical comparison is required in the context of the test, a drawing print is required in order to enable optical scanning.
- 7.5 All the listed dimensions, characteristics and specifications on the design drawing and on the control plan should be listed in a suitable format with the currently measured results. The listing must establish the characteristic reference to the design record (numbering). Each (numbered) characteristic is to be listed in tabular form. The corresponding data with reference to the origin of the part (nest number, tool number, track, etc.) and the clear naming of nominal dimension, the specification limits or tolerances (also at free size tolerances) are to be specified. In case of several nests/tracks, etc. these are to be represented next to each other, as far as possible. To this purpose the corresponding forms of ebm-papst can be used. However, it is also possible to use the forms Measuring report Appendix 2 (VDA) or „Dimensional Results“ (QA 9000). If the individual values for an item are not specified, the format „min / max“ with the respective minimum and maximum values are to be entered. In the case of group characteristics / division characteristics and characteristics with form faults > 20% of the tolerance range the measured values are to be specified in "Min. and max. values". Any existing deviations from the specification are to be marked in the forms for example by underlining



and the number of faulty sample parts is to be specified.

Several nests/tracks are to be represented next to each other as far as possible (see ebm-papst "Nests" form).

7.6 The supply should assign a unique number to each dimension test or specification in a copy which is to be supplied of the drawing used. This number is to be used in the measuring report.

7.7 Attributive characteristics are to be described verbally (e.g. burring degree, material specifications, etc.) and to be confirmed individually in the measuring record.

## **8. Records of material tests**

The supplier must dispose of records of the results of the material tests which were specified in the design records or the control plan. If chemical, physical or metallurgical requirements exist, material tests must be carried out for all the parts and production materials in accordance with the requirements of the design record or control plan.

All the tests required in accordance with the design records and assigned specifications should be listed in a suitable format, whereby the number of tested products and the current results of each test must be listed. The supplier must also list each approved technical modification document which has not been included in the design record on which they are based.

In the case of products which are based on a material specification developed by the customer and a list with sub-contractors approved by ebm-papst, the supplier must obtain the materials and/or services (e.g. coating, electroplating, thermal treatment) from sub-contractors contained in this list (also refer to Chapter 3. Proof of the technical approval by ebm-papst on Page 6).

If there are no requirements, tests are not necessary.

### **8.1.1 Material confirmation**

The material confirmation confirms the designation of the material used in accordance with the specification. This can also be done in the measured result (see Chapter 7).

### **8.1.2 Material certificate (material data sheet)**

Material certificate of the raw material manufacturer for the material batch which was used for the sample parts. The certificate must contain the set values, limits and actual values of the required characteristics.

#### **Material data sheet for contained substances which have to be declared in vendor parts**

Substances whose application are prohibited by law may not be contained! Dangerous substances which arise or are released during use also have to be specified.

The ebm-papst list of substances which have to be declared / are not desired / are prohibited with the respective date index has to be observed. The questions on the contained substances in the vendor part are to be answered correspondingly in accordance with VDA Volume 2 "Initial sample test report VDA substances in vendor parts (material data sheet)". The information on the contained substances is to be provided in the ebm-papst form or VDA form. The design and purchase guideline "Harmful substances" technical terms of delivery of ebm-papst is decisive.

### **8.1.3 Material test reports**

The material test reports are to be provided if they are explicitly required by ebm-papst. In this case the scope and contents of the report are agreed separately.

### **8.1.4 International Material Data System (MDS)**

In case of the usage of subject of the contract is fixed during product discussions, the substances of content must feed into the International Material Data System (MDS).

[\[http://www.mdssystem.com/\]](http://www.mdssystem.com/)

A guidance for access to the MDS can be requested at ebm-papst.

## **8.2 Performance record**

- 8.2.1 The supplier must dispose of records of the results of the performance tests which were specified in the design records.
- 8.2.2 If requirements for the performance or function are specified, performance tests have to be performed for all the parts and production materials in accordance with the requirements of the design records or other customer requirements (refer to Chapter 19. Proof of the fulfillment of further requirements).
- 8.2.3 The result report has to contain the following:
- Approval state of the design records of the tested parts, the number, the date and the approval state of the specifications of the part used for the test.
  - Every approved technical modification document which was not entered in the design records on which the manufactured part is based.
  - The date on which the test took place.
  - The result of all the tests required in accordance with the design documents and the corresponding specifications is to be listed in a comprehensible form, including the tested quantity and the results of each individual test.

## **9. Provisional process capability proofs (Ppc)**

### **9.1 General:**

- The provisional process capability (Ppc) has to be submitted in the statistically common display forms (histogram, probability paper, etc.) as the parts for all the "special characteristics" with a specified minimum process capability (e.g.  $C_{pk} \geq 1.0$ ) which were specified by ebm-papst.
- An analysis of the measuring systems has to be carried out in order to recognize whether measuring errors influence the measuring results of the study (refer to Chapter 10).
- The supplier should select the number of parts which are to be included from a pre-production for the test as large as possible so that the process capability test can be carried out. Unless specified otherwise by the responsible employee, ebm-papst expects a production of at least 20 random samples with at least 5 parts per form nest/track/station for a provisional process capability test (Ppc). Alternatively the determination and specification of the machine capability index  $C_{mk}$  per form nest/track/station is possible.

### **9.2 Quality capability parameters**

In order to calculate quality capability parameters at "special characteristics" and at all the "verify characteristics" with a specified minimum process capability (e.g.  $C_{pk} \geq 1.0$ ) ebm-papst expects that the supplier uses recognized processes and techniques (VDA, QA9000, DIN 55319) for process testing.

- 9.2.1 If enough measured values are available from the past or enough data are available from pre-testing (at least 100 random sample measured values), the process capability can be calculated in accordance with a known and proven distribution model at a stable process. If the proof cannot be brought on the distribution model with statistically recognized models, ebm-papst expects the application of the M4 procedure (percentile method) in accordance with DIN 55319. In the case of chronically unstable processes at which the measured values all lie within the specified limits and show a predictable pattern, the provisional process capability characteristic (Ppc) should be calculated.
- 9.2.2 In case of multiple-cavity dies (nests), forging dies, models, casting molds or also production stations or lines, the valid process capability characteristic from the worst capability characteristic of a cavity, etc. should be used.

### **9.2.3 Acceptance criteria for the provisional process capability analysis**

The provisional process capability must fulfill the acceptance criteria for all the special characteristics which were specified by ebm-papst before the part submission. The supplier must apply the following acceptance criteria for evaluation of the process for processes which are

regarded as statistically stable, in as far as nothing else has been specified by ebm-papst.

- Provisional process capability characteristic  $P_{pc} \geq 1.67$   
The process currently fulfills the customer requirements. Serial production can be started after the approval, whereby the process control plan is to be observed.
- $1.33 \leq$  Provisional process capability characteristic  $P_{pc} < 1.67$   
The process can currently be considered as acceptable, however a further improvement is required. Evaluate the results of the test and agree the corrective actions with ebm-papst and document these in the corrective action plan. If no improvements in the process are carried out before the serial production, this situation requires modifications and the documentation in the process control plan.
- Provisional process capability characteristic  $P_{pc} < 1.33$   
The process currently does not fulfill the customer requirements. Agree the corrective actions with ebm-papst and document these in the corrective action plan. If no improvements are carried out before the serial production, this situation requires modifications and the documentation in the process control plan.

#### 9.2.4 Acceptance criteria for the process capability

ebm-papst requires a process capability characteristic  $C_{pc} > 1.33$  at special characteristics for serial products, if not specified otherwise by ebm-papst.

9.2.5 For all "verify characteristics" with a minimum process capability (e.g.  $C_{pk} \geq 1.0$ ) the description of chapter 9.2.3 is applied but with the limits of  $P_{pk}$  according to  $P_{pk} = C_{pk} + 0.33$ .

## 10. Measuring system capability proofs

10.1 As submission for "special characteristics" and "verify characteristics" with a specified minimum capability (e.g.  $C_{pk} \geq 1.0$ ) ebm-papst expects a measuring system capability study (Gage R&R or GRR), determined using the range method. (to this purpose refer to Process V1a or V1b Ref. Man. MSA QA 9000). The results of these characteristics related to the percentage overall mean value are to be evaluated in order to determine and prove the suitability of the measuring system with regard its usability.

Note: An MS Excel template for test means capability is available from ebm-papst as an aid.

#### 10.2 Acceptance criteria for measuring system capability

Measuring system capability [%GRR]	Measuring device is:
$[\%GRR] \leq 10\%$	Acceptable
$11 \leq [\%GRR] \leq 30\%$	<u>Conditionally</u> acceptable, if measures in the process take this into consideration. (documented in the corrective action plan)
$30\% < [\%GRR]$	<u>Not</u> acceptable

## 11. Documentation of a qualified laboratory

11.1 The supplier must be able to produce the "Field of work of the laboratory" and the corresponding documentation. The proofs of the laboratories used must contain the appropriateness of the laboratory process, competence of the laboratory personnel, testing of the product, traceability of the service and result evaluation. If the supplier cannot produce an own laboratory scope, the questionnaire drawn up by ebm-papst to describe the field of work of the measuring laboratory (laboratory scope) can be used alternatively as the document of proof.

If external laboratories are used, these must be accredited for all the determined measured quantities and calculations in accordance with IEC/ISO 17025. The proof is to be submitted for Parts Class 1.

**12. Production control plan (PLP) / Control plan (CPL)**

The supplier must dispose of a control plan which specifies all the supervision methods used for process control. A process flow diagram is not required if the PLP / CPL lists all the working steps / process steps (refer to Chapter 5 "Process flow diagram" on Page 7). Every working step of the manufacturing process must be taken into consideration from the goods acceptance to the delivery, including product audits at the supplier. No special format is prescribed for a control plan. However, ebm-papst wishes the PLP / CPL in accordance with the form of the QA9000 (refer to Appendix). The production control plan/control plan must conform to the requirements of TS 16949 and cover the following contents:

**a) General data**

- Number of the production control plan,
- Date of issue and modification,
- Customer information (refer to customer requirements),
- Name of the manufacturer/supplier with location designation,
- Part number(s) ebm-papst, if appropriate part number of the supplier,
- Part designation/description,
- Design revision version (refer to specifications),
- Phase to be applied (prototype, preseries, series),
- Main contact person at the supplier/Manufacturer in case of questions regarding the contents,
- Construction stage or working step number,
- Process designation/description of the task.

**b) Product control**

- Product-specific special features are to be identified and emphasized expressly,
- Other control characteristics (number, product or process),
- Specification/tolerance.

**c) Production process control**

- Process parameters,
- Process-specific special characteristics,
- Machines, devices, workpiece bearers, tools for the production.

**d) Methods**

- Test method,
- Fault tolerance (e.g. sensors, limit switches, process supervision means, etc. used),
- Random sample size and frequency,
- Method of control (e.g. SPC control boards, error group cars, etc.).

**e) Reaction plan and corrective actions**

- Reaction plan (listed or written),
- Corrective action.

**12.1 The written description for the control of processes is to be drawn up and applied for:**

- Product families, product, modules, parts

Production control plans/control plans for families of similar parts are accepted if the new parts were tested for conformance. ebm-papst does not require approval of the control plan before the PPAP submission, unless not specified otherwise by the responsible person of ebm-papst.

**12.2 Following is only applied for ebm-papst Mulfingen and "verify characteristics"**

e.g.

$P \begin{pmatrix} 12^{+0.05} \\ -0.05 \end{pmatrix}$

$100\% \begin{pmatrix} 12^{+0.05} \\ -0.05 \end{pmatrix}$

$KS \begin{pmatrix} 12^{+0.05} \\ -0.05 \end{pmatrix}$

$cpk \geq 1.xx \begin{pmatrix} 12^{+0.05} \\ -0.05 \end{pmatrix}$

For all the specified "verify characteristics" at least an inspection plan with the description of the inspection frequency, sample size, nominal value and measurement equipment have to provide.

### 13. ebm-papst part submission by means of cover sheet (VDA) or application for approval (QA9000)

- 13.1 After all the required measurements and tests have been completed satisfactorily, the supplier must draw up the completely filled-out cover sheet of the EMPB (VDA 3rd. edition) or application for approval "Part Submission Warrant" (PSW, QA 9000) with the required information.
- 13.2 The supplier must verify that all the measuring and test results agree with the customer requirements and that the entire required documentation (depending on the submission stage!) is available. The person responsible at ebm-papst must check the cover sheet (VDA) / "Part Submission Warrant" (QA9000) and approve it by signing it.

### 14. Report on appearance

If the product has been identified in the specifications as an "Appearance item" or as "appearance-dependent product/part", a separate "Appearance Approval Report" (QA9000) or test report VDA (Appendix 13) must be drawn up for each part or series of parts for which an approval process is required.

### 15. Checklist for requirements on process-engineering products (bulk materials)

The checklist "Requirements on process-engineering products" must be agreed with ebm-papst for process-engineering products (refer to "Process-engineering products" on Page 4).

### 16. Sample parts

- 16.1 The supplier must send ebm-papst the sample serial parts (or first samples) which are required and specified in the submission query documents.
- 16.2 Sample serial parts must be marked clearly and delivered as "first sample".  
The following information is to be provided for the parts:
- Origin: Nest, track, etc.
  - Part number
  - Supplier/manufacturer
  - Submission date/manufacturing date
  - If appropriate, batch information
- If the components are so small that they cannot be labeled, the information is to be specified on the corresponding individual packaging.

### 17. Reference sample

- 17.1 The supplier is advised to keep at least one reference sample (per nest, etc.) for 15 years after the production end of the part number.
- 17.2 The reference sample should be marked as such and be uniquely assignable to the respective PPAP documentation (e.g. date of the PPAP submission, PPAP submission number, etc.).

### 18. List of the product-specific test equipment

- 18.1 The supplier has to list all the product-specific test equipment which was used for the current part number and its variations in an informal list in the context of the PPAP submission.  
(e.g. specially manufactured gages, testing instruments, retainers, etc.)  
Listing can also be carried out in the process control plan/control plan (refer to Chapter 12. Production control plan (PLP) / Control plan (CPL)).
- 18.2 If ebm-papst expressly wishes so, the supplier must submit every part- or aggregate-specific test equipment.
- 18.3 The supplier must provide preventive maintenance and suitable calibration for each specific test equipment during the entire product lifetime.

### 19. Proof of the fulfillment of further requirements

- 19.1 The supplier has to confirm the observance of all the applicable separate requirements which are not named in the specification, if these have not already been confirmed at a different point in the PPAP submission (e.g. packaging types, test specifications, distribution forms, etc.).

### 19.2 Applies only for ebm-papst Mulfingen and Part Class 4

Distributors (suppliers who do not carry out measures which increase the value of the parts to be supplied) must submit the information on the article master data approval instead of the submission documents 1 to 18. The point of the article master data approval by ebm-papst Mulfingen is to establish the proper connection of the manufacturer designation via the article number of the distributor to the ebm-papst Mulfingen part number.

This information must be sent to the respective employee of the buying department of the ebm-papst Mulfingen at least per email whenever the article master data are created/modified before the first delivery.

The following contents are to be sent:

- ebm-papst Mulfingen part number
- Manufacturer
- Manufacturer designation
- Article number of the distributor
- If appropriate, housing form
- If appropriate, output
- If appropriate, tolerance
- If appropriate, nominal value
- Packaging type
- If appropriate, further part-specific characteristics
- Quantity and dates of the planned deliveries

After this information on the article master data approval has been checked, the distributor receives the approval decision for the article master data by ebm-papst Mulfingen in writing.

### 19.3 Applies only for ebm-papst Mulfingen and Part Class 4

Suppliers who carry out measures which increase the value of standard or catalog parts are to proceed in accordance with the requirements placed on the submission documents 1, 2, 7, 8, 13 and 16 for the characteristics which increase the value.

The origin (manufacturer, manufacturer designation) of the modified standard or catalog part is to be listed in the measuring records and a corresponding standard or data sheet of the manufacturer is to be enclosed. If the standard or data sheet cannot be submitted, all the characteristics of the standard or catalog part are to be measured.

## Corrective action plan

The corrective action plan is necessary if "special characteristics" or capabilities and/or "verify characteristics" have not been observed. Also refer to Chapter 12. Production control plan (PLP) / Control plan (CPL).

The following information is to be provided for each special feature of ebm-papst when the tolerance is exceeded:

- Cause of exceeding,
- Planned and implemented actions with reference to the subsequent sampling,
- Assessment of the result to be expected (improvement)
- Dates and responsibilities.

It must be taken into account that a desired specification extension has to be agreed beforehand with ebm-papst. The discussion partners and date of the agreement are to be stated in the corrective action plan. If any stocks are to be taken into consideration, the desired procedure is also to be agreed with ebm-papst beforehand.

## PPAP status of ebm-papst

### Approval

Enabling means that the supplier is entitled to supply production quantities of the part in accordance with the approval of the planning and scheduling department of ebm-papst. The respective part number may be



## **Production Part Approval Process (PPAP)**

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supplied in future in series in accordance with existing orders/general agreement. Renewed submission of the PPAP documents is only required if changes are carried out. Additional conditions are possible.

### **One-off test exception / approval with conditions**

The respective part number may be supplied in future in series in accordance with existing orders/general agreement for the specified duration or the specified number of pieces - if appropriate, under observance of further conditions specified by ebm-papst. Renewed submission of the PPAP documents, referenced to the modified processes, is also required before the specified number of pieces or duration has expired.

### **No approval / rejection**

The respective part number may not be supplied in series until samples have been presented again. Renewed submission of the PPAP documents, referenced to the modified processes, is required before the specified number of pieces or duration has expired.

### **Checklist for approval of vendor parts**

The form is part of the production part approval process. The checklist contains important information on carrying out the PPAP. It is filled out by the responsible person in the buying department and is given to the supplier with the specifications at the beginning of the approval process. The checklist lists for the supplier who is to be contacted in case of questions.

The supplier confirms by his initials in the "Documents enclosed/exist at supplier" that the required documents have been enclosed with the approval or that they are available at the supplier. This sheet is to be enclosed signed with the approval documents.

The enclosed "Remarks sheet" is to be copied, if required, by the supplier and to be used for further remarks if the "Remarks" column in the checklist is insufficient. To this purpose use the "No." column to establish a reference between the remark and the checklist.

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### **ebm-papst master forms:**

- Measuring record
- Measuring record for 2 to 6 nests
- Corrective action plan
- Contained substances in the vendor part (declaration)
- ebm-papst cover sheet
- Performance test report
- Appearance approval report (AAR)