

Guideline for Production Process and Product Approval (PPA)

between

**sonnen GmbH
Am Riedbach 1
87499 Wildpoldsried, Germany**

hereinafter referred as "sonnen"

and

hereinafter referred as "the supplier"

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1 Introduction

This guideline aims to ensure that the necessary documents and procedures for first articles are consistent with the required scope and timing. The first article should proof that the agreed quality requirements met under serial conditions. The result is entered into the regular vendor evaluation.

2 Requirements

First articles shall be carried out under the following conditions:

- New or changed parts/ material
- Changed suppliers
- Changed specification
- Changed production conditions/ process change
- Changed production location
- Long suspension of production (time > 1 year)

First articles must be carried out in accordance with the applicable VDA Vol. 2 or QS9000 (PPAP) and documented in a first article inspection report (EMPB), conform to the template requirement, which is required by sonnen (see 7 - "submittal level").

If suppliers do not have a first article inspection report in accordance with VDA/ QS9000, it may be provided by sonnen.

3 First article

The production of first articles must be carried out under serial conditions with serial tools/ serial devices and serve as basis for the product- or process release.

Unless a separate agreement has been made in form of a delivery specification between SUPPLIER and the responsible employee of sonnen, the following shall be carried out for the first article inspection:

Test results:

All test results must be recorded in a first article inspection report with setpoints, the corresponding tolerances and the actual values. When testing several samples, all the measured values of each sample must be written down one by one, whereby the actual values must be assigned to the marked samples. The drawings/ specifications with the marked characteristic shall be supplied.

Scope: 3 pieces (1 piece for each cavity, if relevant)

Test equipment:

The requirements of the latest edition of QS9000 or VDA Vol. 5 apply for the capability of test equipment. Sonnen reserve the right to request a proof of the accuracy and regularity of monitoring the relevant test equipment of the supplier in case of deviations from the ability.

Proof of process capability:

For all defined test and functional measures specified in the specification documents (e.g. drawings), a statistical process capability must be proved in series. Appropriate evidence must be enclosed with serial deliveries without application. For the PPA the supplier must present

the current quality situation for all defined test and functional measures by means of a short-term capability (sample of least 20 parts per characteristic):

- Sample scope
- Nominal and actual values
- Tolerance limits
- Average
- Standard deviation
- Short-term process capability Cmk-values ≥ 2.0
- Long-term process capability Cpk $\geq 1,67$

Material-specific information

- Plastic: - Acceptance test certificate "3.1 or 3.2" according to DIN EN 10204
- Process parameters
- Metal: - Acceptance test certificate "3.1 or 3.2" according to DIN EN 10204
- Elastomers: - Acceptance test certificate "3.1 or 3.2" according to DIN EN 10204
- Shore hardness A or B

Other tests

If further tests are determined according to the technical specification of the part, the results of these tests are also part of the PPA.

Delivery:

First articles of any kind shall be delivered separately from other parts (within a delivery) and must be clearly marked as first article. The first articles must be marked traceable to the measurement results. Test and measurement results shall be submitted in writing to the first articles. The first articles must send to the sonnen staff of quality assurance department. Electronic delivery of the PPA in advance is desirable.

4 Decision

Formal serial deliveries may only be made after a successful first article has been carried out and a written approval has been given by the PPA. Any special permits must be defined and are depending on quantity or time and must be released by quality assurance of sonnen. Sonnen reserves the right to conduct a process audit for the decision-making at SUPPLIER within the framework of PPA. The SUPPLIER shall be able to support sonnen as best as possible and make a commitment to work out the deviations contemporary which are determined in the audit report. The release of the samples does not relieve the SUPPLIER from the responsibility for the quality of its products, nor does the release of the samples constitute a delivery order.

5 Change of revision level

Only the affected characteristics/ specifications of change, as well as the test and functional dimensions of the drawing, need to be tested. The above described formal regulations applies.

6 Exceptions

Deviations of the specifications and requirements stated in this document may be accepted by mutual agreement between the SUPPLIER and the quality assurance of sonnen. Exceptions shall be documented in writing as a part of the first article inspection report.

7 Submittal level

First articles must be carried out in accordance with the applicable VDA Vol. 2 or the QS9000 (PPAP) and documented in a PPA report, conforming to the template requirement, which is required by sonnen (see table below).

Unless otherwise agreed with sonnen, "Level 2" is standard. The submittal levels are listed in the table below.

| No. | Requirements | Level 1 | Level 2 | Level 3 |
|-----|--|---------|---------|---------|
| 1 | PPA report cover sheet | X | X | X |
| 2 | Test results (e.g. dimension, function, material, haptics, surface, etc.) | | X | X |
| 3 | FMEA | | E* | E* |
| 4 | Process flow chart (production and inspection steps) | | X | X |
| 5 | Supplier design and development approvals if responsible for development | | X | X |
| 6 | Production control plan | | | E* |
| 7 | Inspection and test equipment list (product-specific) | | | X |
| 8 | Inspection and test equipment capability study (MSA) | | | X |
| 9 | Process capability | | X | X |
| 10 | Confirmation of compliance to legal requirements, if agreed with sonnen (e.g. environmental, safety) | | X | X |
| 11 | Drawing/s, specification/s (stamped) | X | X | X |
| 12 | Transportation / Packaging | | | X |
| 13 | Change history | X | X | X |
| 14 | Other tests (Certificates, RoHs certificates,...) - if agreed with sonnen | | X | X |

X = Requirement for submittal level

E* = for perusal only. Documents remain by supplier.

Verification with revision level and date must documented.

8 Non-adherence

If the agreed first article inspection does not lead to success, the supplier bears all additional costs incurred by sonnen which are directly related to the sampling process, if he's responsible for the negative result.