Production Process and Product Release Procedure

Note:

The most significant changes compared with the previous version of May 2012 are displayed in green text below.

# Purpose

The Schaeffler Group’s *Production Process and Product Release Procedure* is to be used by the supplier as a means of proving that all product requirements agreed with the customer are being met.

This method applies to the processes involved in the manufacture of products (raw material, semi-finished products, components and chemical operating materials) and to services such as coating or heat treatment for example. The release comprises an assessment of the production process or service based on the relevant documents, records and initial volume production samples, to ensure that the requirements associated with the volume production of products which conform to specification are met.

# Assessment of the production process

The supplier is personally responsible for assessing the effectiveness of his volume production process for initial production sampling and therefore prior to to volume production release. A trial production run takes place to establish whether the existing volume production process is capable of manufacturing the products to the customer’s required quality with the agreed production capacity, for a stipulated period, or of providing the relevant services.

In order to furnish proof of the planned output, the following must apply

* all volume production equipment (e.g. installations, machinery, tools, inspection equipment) must be in operation
* in situ
* using volume production material
* working to full capacity
* using standard personnel
* and all supporting systems

A batch size which is representative of the process (usually daily requirement from annual requi­rement) should be used to assess the volume production process.

In the case of Risk Level RL 1 to *QAA / S 296001-1 - Advanced Product Quality Planning*, the volume production process is usually assessed in the presence of the customer and also, where necessary, his end customer. The date and scope of the process assessment are agreed between customer and supplier within the framework of the *APQP*.

This review can also take place for Risk Level RL 2 where required.

# Sample types

A distinction is made between various sample types:

## Prototypes

Prototypes can originate from provisional production processes. Unless requested otherwise by the customer in his order, the following constitute the minimum requirements for prototype sampling:

* Inspection record with nominal/actual comparison of at least one part, e.g. by means of an entry in the drawing
* For prototype tools with several cavities: nominal/actual comparison of one part per cavity
* Marking of checked prototype parts for allocation to inspection record
* Indication of material composition

## Initial volume production samples

Initial volume production samples are products or services which have been manufactured or provided in full using standard operating materials and under standard conditions. They must be taken from a batch size which is representative of the volume production process.

# Cases which call for initial volume production sampling

Initial samples must always be submitted by the supplier, on his own initiative, in the event of the following:

* New parts or products (i.e. a specific part, subassembly or material which has not been supplied to the customer before)
* Changes to the product involving the drawing, specification or material
* Changes to the drawing or specification which do not affect the product or function. The scope of the sampling process and the submission level must be agreed with the recipient site.
* Elimination of a defect in a product that has already been sampled previously, i.e. the release was subject to conditions or initial samples were discarded (repeat sampling).
* Production interrupted for extended period (no production for more than 12 months) on the precondition that the product was previously delivered at least four times a year
* Receipt of delivery at another or additional Schaeffler site. The scope of the sampling process and the submission level must be agreed with the recipient site.

Following prior notification by the supplier in accordance with *QAA / S 296001-3 – Modification Approval / Special Release, Appendix 1*, the scope of the sampling process is defined by the customer in the event of the following:

* Changes to the production process
* Change of subcontractor for raw materials or purchased parts, or for services, e.g. heat treat­ment or coating
* Volume production which uses tooling, machinery or installations which are to be transferred to a different production plant of the supplier
* Use of new tooling (with the exception of wear tooling, such as indexable cutting inserts, drills)
* Use of additional or replacement tooling, e.g. multiple cavity tooling / cavities
* Volume production which uses existing tooling, machinery or installations that have been over­hauled or modified
* Significant changes to inspection or test methods released through preliminary sampling

The supplier must submit initial volume production samples at the customer’s request, e.g.:

* Following serious quality problems
* As part of the periodic requalification inspection of products

# Documentation

The supplier must prove that all features correspond with the customer’s specifications, e.g.
drawings incl. corresponding technical delivery conditions and specifications, by specifying the inspection results in the inspection report for initial volume production samples. Deviations must be clearly shown in the inspection report.

Unless agreed otherwise in writing, the storage period for documentation relating to initial volume production samples, as well as for reference sample parts (one per cavity in cases where multiple cavity tooling is used) is the agreed life of the product plus one year.

Where possible, the documentation should be sent electronically to the relevant sampling depart­ment at the customer’s recipient plant in advance. Where this is not possible, it should be included with the initial volume production samples or delivery papers.

Unless specified or agreed otherwise in the order or in one of the customer’s applicable "technical delivery conditions“, the following requirements apply as standard.

## Dimension, material and function report

A clear reference to the inspection report (see *QAA / S 296001-2, Appendix 2*)must be established through the consecutive numbering of the features in the drawings, including the
corresponding "technical delivery conditions" and specifications.

Following prior agreement with the customer, features which cannot be checked by the manufacturer are either confirmed using certification by means of specific test results (e.g. material certi­ficate) or proven by means of inspection certificates from accredited inspection institutes (see table in *Section 5.5*, requirement no. 12).

### Components

Unless requested otherwise by the customer, five parts taken at random from the process are
inspected. The actual values must be assigned to the relevant numbered sample part in the
corresponding forms of the inspection report for initial volume production samples (see *QAA /
S 296001-2, Appendices 2 to 4*). In the case of multiple cavity tooling, 5 parts must be
clearly marked and delivered for each mould cavity. In each case, one part must be measured in full and documented by means of an inspection report.

### Raw materials and semi-finished products

Unless stated explicitly in a corresponding "technical delivery condition“ or specification, the test and sample scope for raw materials and semi-finished products (e.g. granulated material, strip, wire, tube, rod profiles) must be agreed with the relevant sampling department at the receiving customer plant.

### Chemical operating materials

Unless stated explicitly in a corresponding "technical delivery condition“ or specification, the test and sample scope for chemical operating materials (oils and greases) must be agreed with the customer’s relevant sampling department.

## Evidence of process capability

The preliminary process capability of the characteristics identified specifically in the customer
drawing or by means of applicable specifications (to *Schaeffler Standard* *S 102012-1)* is determined from a minimum of 125 parts (25 samples of 5 parts). A capable process exists if the preliminary process capability generates a capability index Ppk > 1,67.

A minimum of 10 parts must be checked for destructive testing and a minimum of 300 parts for attributive testing.

## Appearance report

Where parts are required to have a defined appearance in accordance with a drawing regulation or specification, this feature must be rated accordingly in the inspection report.

## Duty to supply information on ingredients

The inspection report for initial volume production samples must include confirmation that the materials used and their ingredients comply with the customer’s requirements where the environ­ment, recycling and safety are concerned.

The ingredients of the following products must be specified in the *International Material Data
System IMDS* (www.mdsystem.com):

* Components (e.g. seals, springs, rotating parts)
* Subassemblies
* Oils / greases for products
* Coatings (e.g. phosphate coating, chrome plating)

The corresponding *IMDS* ID no. (ident. number) must be entered in the *Part Submission Warrant*, *QAA / S 296001-2, Appendix 1*. Following prior agreement with the sampling department at the recipient customer plant, the form in *Appendix 4 – Ingredients* to *QAA / S 296001-2* can also be used as an alter­native to an entry in the *IMDS* database.

The requirements governing information on the use of prohibited substances and substances
requiring declaration are described in *Schaeffler Standard S 132030-1*, see *www.Schaeffler.de* */ Suppliers /* *Environmental and Safety Protection*.

## Marking and packaging

Transport containers and delivery paperwork from consignments of initial volume production
samples must be clearly marked "Serienerstmuster / Initial Sample".

If the initial volume production samples cannot be delivered in the designated volume production
packaging, the supplier must ensure by means of suitable packaging that the quality of the
samples is not impaired by, for example, damage or corrosion.

## Submission levels

The *Production Process and Product Release Procedure* must be completed in full by the supplier and documented. The customer stipulates the type and scope of the initial production sampling process to the supplier. Unless defined otherwise by the customer in the order, the supplier should generally follow **submission level 3**.

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| --- | --- |
| **Level** | **Requirements** |
| 1 | Only the *Part Submission Warrant* (sheet, *Appendix 1*) is submitted to the customer and, if additionally requested by the customer, a *"Report on the approval of appearance-dependent parts“.* |
| 2 | *Part Submission Warrant* with sample parts and restricted supporting data / documentation are submitted to the customer. |
| 3 | *Part Submission Warrant* with sample parts and comprehensive supporting data / documentation are submitted to the customer. |
| 4 | *Part Submission Warrant* and other requirements defined by the customer within the framework of *Advanced Product Quality Planning.* |
| 5 | *Part Submission Warrant* with sample parts and complete supporting data / docu­mentation are available to the customer for evaluation at the supplier’s production site. |

The requirements associated with the relevant submission level can be found in the following table.

| **No.** | **Element / requirement** | **Explanation / comments** | **Submission level** |
| --- | --- | --- | --- |
|  |  |  | **1** | **2** | **3** | **4** | **5** |
| 1 | Design documents | Customer drawing (marked characteristics drawing) | R | S | S | \* | R |
| Specification, product delivery guideline, technical delivery conditions (marking of characteristics) |
| For components which the supplier was responsible for developing ("Black Box“) | R | R | R | \* | R |
| For all other components | R | S | S | \* | R |
| 2 | Modification documents | Documents on changes approved by the customer, which are not yet documented in the drawing, if available | R | S | S | \* | R |
| 3 | Design release from the customer | Design approval from the customer, if requested in the customer drawing | R | R | S | \* | R |
| 4 | Design FMEA  | Only applicable to suppliers with design responsibility. Cover sheet to Design FMEA, including current modification level, date and group of participants, as a minimum. | R | R | S | \* | R |
| 5 | Process flow chart(s) | Process flow chart for the product or the product family | R | R | S | \* | R |
| 6 | Process FMEA | Cover sheet to Process FMEA, including current modification level, date and group of participants as a minimum | R | R | S | \* | R |
| 7 | Control Plan  | Control plan as a minimum for all special characteristics (see *Schaeffler Standard S 102012-1*) for the product or the product family | R | R | S | \* | R |
| 8 | Inspection equipment capability study  | Inspection equipment capability study of inspection equipment for all special characteristics | R | R | S | \* | R |
| 9 | Dimensional measurement results  | Inspection reporton all dimension characteristics in the customer drawing and applicable specifications (form, *Appendix 2*), including OK / not OK rating | R | S | S | \* | R |
| 10 | Material test results and function test results  | *Material inspection report* on all material data in the drawing and all applicable specifications (form, *Appendix 3*), including OK / not OK rating. Enclose results from raw material supplier as 3.1 inspection certificate to *DIN EN 10204* | R | S | S | \* | R |
| Ingredients must be entered into the *International Material Data System* (*IMDS*). In exceptional cases, the form in *Appendix 4* may be used |
| Evidence on the use of prohibited substances and substances requiring declaration in accordance with *Schaeffler Standard S 132030-1* |
| *Inspection report* on all function features in the customer drawing and applicable specifications (form, *Appendix 2*) including OK / not OK rating |
| 11 | Process capability study  | Process capability evidence for all special characteristics in the customer drawing, and other features specified by the customer, and applicable specifica­tions (see *Schaeffler Standard S 102012-1*); alternatively as Cm/Cmk, Pp/Ppk, or Cp/Cpk values | R | R | S | \* | R |
| 12 | Documentation from the test laboratory  | If an external laboratory has been appointed, the laboratory’s test results and the *ISO/IEC 17025* certificate must be submitted, with specification of the scope. | R | S | S | \* | R |
| 13 | Report for appearance-critical parts  | If requested by the customer and specifically agreed within the framework of *Advanced Product Quality Planning.* | S | S | S | \* | R |
| 14 | Sample parts  | Check five sample parts, unless specified otherwise. Deliver parts in volume production packaging in accordance with packaging data sheet. | R | S | S | \* | R |
| 15 | Reference sample part | At least one reference sample part per cavity should be stored by the supplier for the life of the product, plus one additional year. The allocation to the initial sample inspection report should be ensured by means of clear marking. | R | R | R | \* | R |
| 16 | Inspection equipment / Inspection aids | Not required (only if specifically requested)  | \* | \* | \* | \* | \* |
| 17 | Compliance with customer requirements  | Not required (only if specifically requested) | \* | \* | \* | \* | \* |
| 18 | Part Submission Warrant  | *Part Submission Warrant* (sheet, *Appendix 1*) | S | S | S | S | R |
| 19 | APQP Status Report | For Risk Level RL 1 or RL 2, in accordance with *QAA / S 296001-1 Advanced Product Quality Planning* (sheet, *Appendix 2*)  | R | S | S | \* | R |
|  |
| S | Submit to customer |
| R | Retain and keep available for immediate access at customer’s request |
| \* | The decision on whether to submit (S) or retain (R) the individual elements is agreed specifically between customer and supplier during the course of the *APQP* |
|  | In addition to *AIAG* standard – *"PPAP 4th Edition“* |

# Customer release

Following submission of the initial volume production samples and documentation, the customer carries out further inspections at his own discretion, which can also take place at the supplier’s premises in the case of submission level 5 or as part of a trial production run.

One of the following decisions is made on the basis of the initial sample inspection report and the inspections carried out by the customer:

* Approved
* Conditional approval (repeat sampling required)
* Rejected (repeat sampling required)

The initial volume production samples must be released by the customer before the volume production products can be delivered.

# Applicable documents

**Applicable appendices to S 296001-2**

(see *www.Schaeffler.de / Suppliers / Quality / Production Material*)

*Appendix 1 Part Submission WarrantAppendix 2 Inspection ReportAppendix 3 Material Inspection ReportAppendix 4 Ingredients*

**Applicable standards**

Public standards:

*DIN EN 10204*

*ISO/IEC 17025*

Customer specific standards:

*S 102012-1 Technical drawings; Classification of characteristics / special required
 documentation S 132030-1 Material Compliance, environmental protection, occupational health; Prohibited and
 declarable substances; Raw materials, products, components, branded items,
 purchased parts, mixtures of substances, chemicals, packaging* (see *www.Schaeffler.de / Suppliers / Environmental and Safety Protection*)

*S 296001-1 Quality Assurance Agreement with Production Material Suppliers; Advanced
 Product Quality Planning*

*S 296001-3 Quality Assurance Agreement with Production Material Suppliers; Modification
 Approval / Special Releas*