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| Quality assurance agreement –  Submodule electrics/electronics components  Specific quality assurance requirements for suppliers of electrical/electronic components and development services |
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between

Schaeffler Supplier no.:

UPIK/DUNS-Nr.:

(hereinafter referred to as the Supplier)

and

(hereinafter referred to as Customer)

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# Scope

This document is a sub-module to S 296900 "Quality Assurance Agreement with Schaeffler Group Suppliers" and to the modules of the Quality Assurance Agreement and is considered a binding agreement of specific quality requirements for Schaeffler suppliers of electrical/electronic components and development services.

It sets out concrete guidelines and instructions to be followed in the implementation of quality assurance measures that are complementary and/or based on the project-specific requirements agreed in the technical/non-technical and project-specific documents.

If this sub-module contains deviating or contradictory information compared to other norms, standards, specifications or regulations, the project-specific information shall apply. In case of doubt, clarifying agreements must be made in writing in consultation with Schaeffler.

# Procurement of applicable standards & guidelines

If additional project-specific standards and guidelines are required beyond the requirements currently described and the customer is unable to provide these, the supplier must procure these on its own responsibility and coordinate them with the customer accordingly, if this has not already been done.

# Maturity assurance

The increased integration of mechatronic components and software in product applications increasingly requires the early involvement of suppliers in the Schaeffler product development process. In the "maturity assurance for new parts" method in accordance with the applicable VDA volume, the supplier must ensure in-process assurance of product maturity up to the start of series production. By harmonizing contents and processes throughout the entire supply chain, the start-up, delivery and field quality of the scope of supply under consideration must be improved.

The scope of the maturity assurance must be agreed with Schaeffler and implemented immediately with the start of the project.

# Specific requirements for electrics/electronics - components

## General requirements for the production environment

The environmental conditions along the value chain (cleanliness, temperature, humidity, etc.) must meet the component requirements. These requirements must be ensured by suitable measures and monitored and documented accordingly.

### Cleanliness and handling

The supplier must ensure compliance with the cleanliness requirements from drawings and applicable specifications or standards by means of regular inspections in the development and series production phase in all quality-relevant areas along its value chain over the entire component life cycle (incl. production, logistics and inspection areas). This requirement is an addition to S 252001.

The procedures and methods used to comply with the cleanliness requirements must be agreed with the customer. The use of cardboard boxes and wooden pallets is not permitted in the production area. Containers of production material must be covered when stored in the production area.

The handling of parts, components and assemblies must be carried out in such a way that damage can be ruled out throughout the manufacturing and transport process.

### Electrostatic discharge

When handling ESD-sensitive components, parts and assemblies, the necessary measures in accordance with DIN EN 61340-5-1 for protection against electrostatic discharge must be defined and implemented by the supplier.

## Production and test concept planning

The following concept documents must be provided prior to project nomination:

* Line layout including production, inspection and test equipment and employees (number and qualification level)
* Description of the technologies used
* Process flow
* Commissioning, inspection and test scopes (incl. frequency and content)
* Proof of capacity for production and test equipment
* Proof of capability for machines and systems used
* Safe launch concept

## Safe launch concept

The purpose of the safe launch ramp-up assurance is to ensure fault-free delivery during the start-up phase. It shall also enable the supplier to quickly identify and rectify any quality problems that occur at the site. A safe launch plan must be prepared on a project-specific basis in consultation with the customer's Q manager. The safe launch plan shall be integrated into the Control Plan. The safe launch procedure is maintained until the defined exit criteria are reached.

The exit criterion for launch shall be documented in the Control Plan. Deviations or defects during the safe launch must be analyzed, documented, monitored and made available to the customer on request.

The Control Plan for ramp-up protection shall contain at least the following elements:

* Extended test scope and frequency for individual criteria (min. CC, SC & IC features)
* Additional criteria that are only checked during safe launch
* Additional visual inspection at specific criteria and after defined process steps by specially trained personnel
* A test concept for early detection of errors during ramp-up

Subcontractors must also be included in the safe launch concept.

## Final test (End of Line)

An end-of-line test must be carried out for each fully assembled component. The objectives and content must be agreed with the customer before the B sample phase.

First Time Through or First Pass Yield (FTT, FPY) must be documented. An automatic OK marking (e.g. DMC or customer label) must be implemented in connection with the automatic final inspection. A defined temperature and humidity range must be considered and documented for the EOL (e.g. room, high and low temperature tests). Defective components must generally be analyzed and documented by the quality department.

## Flash process (SW parameterisation/variant coding not addressed)

Flash processes used by the supplier must be suitably designed and implemented in a process-safe manner, considering quality, safety and product cybersecurity aspects.

The flash process must be specifically coordinated with the responsible Q manager in the project. The following guidelines apply in particular:

* The supplier must ensure that only approved E/E and software configuration (incl. associated calibration parameters and data sets) are produced and delivered
* After the flash process, the supplier must protect the software from unauthorized access with suitable measures (encryption, certificates, etc.).
* The successfully completed flash process must be ensured by means of suitable measures (checksum, etc.).
* In particular, it must be ensured before delivery that the component and its software parts have a released configuration/production status.
* In the course of traceability, hardware / software versions must be clearly identifiable on the component (label).

## Process interlock

The processes of line production and testing must be automatically interlocked. In the event of a failed test, the corresponding component must be automatically locked by the production control system, thus preventing further processing of it (locking mechanism).

A blocked component may only be released after documented analysis and approved reworking, otherwise the component must be scrapped in a process-safe manner. Rework must be approved by the person responsible for the product.

## Rework and repair in the manufacturing process

In general, repair and rework is not permitted.

In the particular case that Schaeffler grants permission to ship reworked and repaired components, these must be clearly marked and kept separate from the regular delivery. The details of this procedure, e.g. the way in which the product is marked, must be agreed with Schaeffler in each individual case. Repaired and reworked products must not be delivered to Schaeffler without prior written approval.

If the delivery of repaired products is permitted, these repaired products must also meet the same requirements and product specifications as new products. The supplier shall monitor its repair process by specific quality statistics at Schaeffler's request. In the event of a repair, the measures, e.g. labelling, packaging or delivery of the product, must be agreed with Schaeffler in advance.

## Obsolescence management

Obsolescence is the lack of deliverability by the original source of supply and the associated lack of availability due to diverse influences. The application of obsolescence management ensures that obsolescence is considered as an integral part of design, development, manufacturing and supporting areas in use to minimize costs and negative impacts throughout the product life cycle.

Obsolescence management according to S 296013 must be implemented accordingly in order to meet the requirements of IEC/EN 62402.

Product and process change notifications must be evaluated and approved by Schaeffler in accordance with the currently applicable ZVEI *guideline* - *"Guideline for Customer Notifications of Product and /or Process Changes (PCN) of Electronic Components specified for Automotive Applications".*

## Selection & qualification of electronic components

The Automotive Electronic Council Qualification Standards (AEC-Q), have to be applied in the development, manufacture and distribution of electronic components. In exceptional cases, alternative components that do not comply with the AEC-Q standards may be used through appropriate selection and qualification. The selection and qualification of all components must be coordinated with Schaeffler Design, Development and Quality in the course of the manufacturability assessment (enquiry and quotation phase).

The supplier must ensure that the electrical and electronic parts or components included in his scope of delivery are suitably selected and used from the point of view of functional safety or product cyber security with regard to function and properties.

## Functional safety

* The supplier must ensure the functional safety of its scope of supply over the entire life cycle in accordance with Schaeffler Standard S 111111; this includes, among other things: The use of parts and components suitably selected and used from the point of view of functional safety.
* The identification, compliance and monitoring of safety-relevant special characteristics
* The timely reporting of identified product and process deviations that may have an impact on functional safety.

## Product Cybersecurity

The increasing proportion of networked and software-based systems in vehicles and additional interfaces as well as integrated functionalities in the components are increasing the risk of cyber attacks. The supplier must ensure that the corresponding products, processes and systems are available and the necessary organizational and operational precautions are taken to ensure that these comply with national/international laws and regulations relating to product cybersecurity.

S 111211 describes the relevant aspects for product definition, design, implementation, testing and verification. This standard applies for a holistic implementation of automotive security throughout the product development process and series production process.

## Software quality

Quality assurance requirements for suppliers of E/E components or development service providers with

integrated software or software are described in the QSV - Module Software S 296005.

# Term and termination

This sub-module "Specific quality assurance requirements for suppliers of electrical/electronic components and development services" applies as a supplement to the contractually agreed S 296900 "Quality Assurance Agreement with Schaeffler Group Suppliers" and/or further QAA modules and shall enter into force upon signature by both parties. This Annex is concluded for an indefinite period. If S 296900 "Quality Assurance Agreement with Suppliers of the Schaeffler Group" is terminated, this shall simultaneously be deemed to be a termination of the Annex "Specific Quality Assurance Requirements for Suppliers of Electrical/Electronic Components and Development Services" and this shall end at the same time as S 296900 "Quality Assurance Agreement with Suppliers of the Schaeffler Group". Irrespective of any termination of S 296900 "Quality Assurance Agreement with Suppliers of the Schaeffler Group", this Annex "Specific Quality Assurance Requirements for Suppliers of Electrical/Electronic Components and Development Services" may be terminated in writing by either party by giving 12 months' notice - to the end of the month. Termination of this sub-module shall have no effect on the continued existence of S 296900 "Quality Assurance Agreement with Suppliers of the Schaeffler Group" and/or other modules as well as the contracts concluded between the parties under validity. The terms and conditions of S 296900 "Quality Assurance Agreement with Suppliers of the Schaeffler Group" and the modules shall continue to apply to these.

# General

The contractual relationship shall be governed by German law to the exclusion of the conflict of laws provisions. The place of jurisdiction is Nuremberg, Germany. However, the customer is also entitled to sue the contractor at another competent court. Should a contractual provision be or become invalid, this shall not affect the validity of the other provisions.

Within the bounds of reasonableness, the parties are obliged in good faith to replace ineffective provisions with effective provisions that are equivalent in economic result.

# Applicable documents

The following appendices are part of the contract in the respective current version of both S 296900 "Quality Assurance Agreement with Suppliers of the Schaeffler Group" and of this appendix.

(see www.schaeffle[r.de](http://www.schaeffler.de) / Company / Purchasing & Supplier Management / Quality):

Brochure 1 Advance quality planning for suppliers

Brochure 2 Production process and product release for suppliers   
Brochure 3 Change approval / special release for suppliers

Brochure 4 Complaints process for suppliers

Brochure 5 Supplier evaluation

Brochure 6 Escalation process for suppliers

Brochure 7 [Safe Products and Services | Product Safety and Product Conformity](https://www.schaeffler.de/remotemedien/media/_shared_media/08_media_library/01_publications/schaeffler_2/brochure/downloads_1/pps_de_de.pdf)

S 111111 Technical delivery condition - Functional safety

S 111211 Technical delivery condition - Product Cybersecurity

# Agreements

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| **Supplier** | | |  | **Customer** | | |
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| Supplier name | | |  |  | | |
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| Schaeffler Supplier no. | | |  |  | | |
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| Place |  | Date |  | Place |  | Date |
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| Name |  | Signature |  | Name |  | Signature Purchasing |
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| Name |  | Signature |  | Name |  | Signature Quality |