InnoSenT-Quality Assurance

Quality Guidelines for Suppliers (IS-QGLS-2023-08)
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Quality Agreement

Experience and Reliability in Radar Technology

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1. Introduction

Changing customer expectations and world-wide competition require permanent improvement of all products and services including all processes and company procedures. It is INNOSENT's target to offer their customers flawless products with a maximum degree of reliability. Customer satisfaction through quality in every respect has been a decisive factor for INNOSENT's success as a supplier of complex products for their international customers and therefore also for you as our contractor (in the following referred to as supplier), whose products are becoming a part of INNOSENT products.

At that, reaching the **zero-error-target** is an essential condition for all deliveries - which can be achieved and ensured only by way of joint efforts made by INNOSENT and its suppliers together:

Avoiding instead of detecting errors and permanent improvement in the overall process chain, customer query, quotation, order, product creation, start of production, serial delivery and field service are absolutely necessary requirements we must and want to fulfill with the active help of our suppliers.

This guideline is showing our customers what INNOSENT's requirements are, and is further referring to the applicable international standards, methods and implementation information (e.g. from VDA, the German Association of the Automotive Industry) which are needed to make our joint targets a reality. So it is possible to implement a joint quality strategy in order to ensure trouble-free procedures between or suppliers and INNOSENT and to minimize costs.

Range of application

This guideline shall apply for all products and services supplied by a supplier to INNOSENT GmbH and shall be an integral part of the "General Supply Agreement for the Procurement of Production Material", of the „General Terms and Conditions of Purchase of INNOSENT", or it shall become effective by way of an individual agreement.

For clarification, in this guideline, the expressions "shall", "must" and "have to" mean "has a duty to".

2. Implementation of Basic Requirements

2.1. Management Systems and Sustainability

The supplier has effectively introduced a QM system in its company and is therefore proving its ability to provide quality.
A quality management system in line with the requirements according to IATF 16949[2] is a pre-requisite for any supplier relationship with INNOSENT. The minimum requirement is a certificate on the basis of the applicable valid version of ISO 9001 [1]. A third-party-certification acc. to IATF 16949, ISO 14001 [3] (Environmental Management System) and ISO 45001 (Occupational Health and Safety Management System) [4]is recommended by INNOSENT.
Additional requirements can be defined according to VDA Volume 6 Part 1 [10] or the AIAG documents [11]. Specific customer documents may also have to be heeded. The efficiency of the QM-system is mirrored in:

■ Continuous and provable improvement of all business and manufacturing processes and products

■ Delivery quality

■ Supply reliability

■ Continuous field observation of its products and commitment to provide customer information when requested

■ Efficiency and speed in implementing corrective actions

■ Communication on all levels

■ Processing of new products and changes to serial products professionally and in line with schedules

The expiration of a certificate without any planned re-certification shall be advised to INNOSENT no less than three months prior to the expiration date. New certificates shall be sent to the contact person in the sales department of INNOSENT without specific request. Any revocation of a certificate shall be advised immediately. INNOSENT reserves the right to carry out shortterm audits about quality management systems, processes and products with its customers after prior announcement. The commissioners shall be granted access thereto.

SUPPLIER shall nominate a PSCR (Product Safety & Conformity Representative) to be in charge of all related tasks in accordance with VDA Volume “Product Integrity” [12] and IATF 16949 [2].

Assignment and change of any sub-contractor has to be advised to INNOSENT in due time beforehand and is subject to approval. Production Process Approval and Product Approval (PPAP) shall be carried out. INNOSENT reserves the right to carry out short-term audits also of their sub-contractors, if applicable together with their customers, after prior announcement. This, however, does not release the supplier from its responsibilities towards the subcontractor and INNOSENT.

SUSTAINABILITY

All SUPPLIERs are requested to work on reduction of the environmental impacts of their products and processes by developing new solutions supporting the “Circular Economy”.

The SUPPLER must deploy actions on their operational perimeter to

■ improve the energy efficiency and usage of renewable energy of their sites to reduce greenhouse gas emissions

■ prevent air, water, soil and noise pollution

■ reduce hazardous material and waste as well as develop a sustainable use of resources – materials, energy and water

■ protect the biodiversity in the context of land and legal deforestation

On request, the SUPPLIER shall inform INNOSENT about the Carbon Footprint of the supplied products. The Carbon footprint calculation should be carried out in line with the International Standards on LCA (Life Cycle Assessment) (ISO 14040 [13] and ISO 14044 [14]).

SUB-SUPPLIERS

The SUPPLIER shall ensure that his sub-SUPPLIERS also meet the above-mentioned requirements. As proof, the SUPPLIER must be able to present the valid certificate issued by an accredited certifying company (3rd party audit). If the SUPPLIER places orders with sub-contractors, he shall ensure that his sub-contractors also meet the requirements of this guideline. INNOSENT must be informed in good time about the use of and change in sub-contractor and must approve this. A production process and product release must be conducted.

2.2. Audits

INNOSENT AUDITS

INNOSENT reserves the right to conduct audits and assessments on SUPPLIER´s management systems, processes, products as well as on sustainability at short notice, with the INNOSENT customer if appropriate, following prior announcement. The SUPPLIER shall grant the auditor access accordingly. If the quality management systems, processes or products are subject to type approvals, the SUPPLIER shall also grant access to legal authorities or authorized technical services. The SUPPLIER shall inform INNOSENT about such visits in advance.

If INNOSENT, together with its customers, wants or must carry out audits of SUPPLIERS' contractors (“sub-contractors”), the SUPPLIER shall ensure to enable such an audit to be carried out with sub-contractors.

SUPPLIER AUDITS

The SUPPLIER shall carry out internal planned audits according to VDA Volume 6 Part 3 [5] and/or VDA 6.5 [6] for all the products delivered to INNOSENT and all the processes linked with their development and production at regular intervals, planned annually in advance. On request the SUPPLIER shall provide the results of internal audits to INNOSENT. This is based on contractually defined product specifications and properties as well as further agreements affecting the deliveries, e.g., logistics and packaging. In the event of deviations, the SUPPLIER initiates all the corrective actions necessary and ensures their effective and long-term implementation.

If quality problems occur which are caused by performances and/or deliveries of the SUPPLIER’s sub-contractors, the SUPPLIER shall carry out an audit at the sub-contractor’s if requested to do so by INNOSENT, with INNOSENT participation if appropriate, and present the results to INNOSENT.

2.3. Further Basic Principles

In addition to the stated standards, the INNOSENT-purchase order documents shall be binding, e.g.

- Purchase order drawings including the provisions established therein, e.g. DIN standards, INNOSENT-standards, technical terms and conditions of supply and delivery, data sheets etc.,
- stipulated testing instructions and gauges (test devices),
- additional purchase order data, e.g. packaging instructions,
- special statutory regulations,

- FiFo/FeFo principle
- Special requirements related to sustainability (e.g., responsible sourcing, climate change / product carbon footprint), environmental protection, recycling, health & safety

2.4. DELIVERED QUALITY AND INCOMING GOODS

The products need to be free of any design, material or processing defects and must comply with the specifications and properties contractually agreed. The SUPPLIER shall bring proof of composition of the materials used and their individual components as well as environment-related aspects.

In case of quality problems or blocking of products or processes the SUPPLIER is obliged to inform INNOSENT immediately and in writing, before the products are delivered, and to agree the necessary corrective actions with the Quality Assurance of the INNOSENT production plants.

Furthermore, the supplier has to create a deviation approval request form sheet on its own with meaningful explanation of the deviation itself and risk assessment regarding possible effects. Without signature by the responsible INNOSENT representative of the receiving plant any delivery of the affected products to the respective plant is not permitted.

REQUIREMENTS ON MATERIAL DATA REPORTING SYSTEMS

For all products requested, a material data sheet must be sent to INNOSENT in the IMDS (International Material Data System) or in other Material Data systems that are requested by the final end customer which must be used for specific markets, like CAMDS (Chinese Automotive Material Data System). After agreement the material data sheet can be published. The material data sheets (MDS) must be kept up to date according to the valid IMDS recommendations or equivalent requirements in the relevant system (e.g., IMDS or CAMDS), considering the latest version of the GADSL (Global Automotive Declarable Substance List, www.gadsl.org).

With ending of the delivery obligation, the material data sheet shall be updated with the latest information on materials and substances.

Missing or incorrect material data sheets (MDS) lead to a rejection or only to a conditional sample release and must be reworked until final acceptance.

REQUIREMENTS ON CHEMICAL MANAGEMENT

INNOSENT assumes that all substances for use in products delivered to INNOSENT (e.g., raw materials, process materials, components, assemblies) that require registration in line with REACh (EC directive 1907/2006: Registration, Evaluation and Authorization of Chemicals) [15] have been registered by the SUPPLIER or sub-SUPPLIER for the application used by the SUPPLIER or INNOSENT within the time frame given by REACh. Same applies to other chemical substance inventories worldwide (e.g., TSCA (USA), DSL (Canada), IECSC (China)). If, contrary to expectations, this is not the case, INNOSENT must be informed immediately.

Caused by REACh every SUPPLIER of a product (including packaging) has to declare to INNOSENT all SVHCs (Substances of Very High Concern) within the product, which are contained in a

concentration higher than 0.1 % by weight. SVHCs are listed in an EU publication and this list is permanently enlarged. The SUPPLIER must keep himself informed at all times about the current candidate list. The SUPPLIER is requested not to use SVHC (Substances of very high Concern) in articles and mixtures delivered to INNOSENT.

The restrictions of REACh ANNEX XIV and ANNEX XVII have to be observed in its current version at all times. Products delivered to INNOSENT must follow the restrictions of the EU ELV (Directive 2000/53/EC) [16]

and EU RoHS (Directive 2011/65/EU) [17] as well as the respective legislation worldwide (e.g., China, Korea).

To sell products on a global market it is mandatory, that the SUPPLIER´s production processes and products will comply with all applicable legal environmental regulations and conventions on a worldwide scale in its current version.

The SUPPLIER must fulfill all resulting obligations such as the restriction and forbiddance of substances and their certain uses, e.g., by updating:

■ the material data of its products (IMDS), and

■ used raw, auxiliary and operating materials (Chemical Management).

RQUIREMENTS ON NON-CONFORMANCE REPORTS

A quality control report is used to inform SUPPLIERS about non-conforming deliveries. The costs incurred to INNOSENT for this report are to be borne by the SUPPLIER. Scrapping and reworking costs are recorded by INNOSENT and charged to the SUPPLIER.

Cost recovery will be communicated, if applicable, with each claim through a cost breakdown. The cost recovery process will include, but is not limited to, contaminated stock at INNOSENT affected plant, products in transit, OEM assembly plant, nonconforming received goods, assembly line downtime due to delivery or quality related issues, warranty returns, and costs required to analyze and rectify the effects of a quality, warranty, launch or delivery issue which result in a concern. Inspection costs, analysis costs, rectification costs, transit costs and costs to manage the implementation of a non-reversible corrective action may also be included. Level of cost recovery against concerns will be a significant factor in INNOSENT sourcing decisions.

The QM-system introduced at the SUPPLIERS and the quality assurance process derived from this are the basis for the ability of the SUPPLIER to achieve freedom from defects in all the products and services delivered by the SUPPLIER or on his behalf (“zero defect(s) quality”).

INNOSENT will report defects in the delivery to the SUPPLIER immediately as soon as they have been determined according to a proper course of business. At INNOSENT, incoming goods inspection is restricted to a visual inspection of the transport packaging for external signs of damage, e.g., transport damage, a quantity check and an identity check based on the comparison of the delivery papers with the order documents. Further tests, in particular measuring tests, do not have to be performed. To ensure the quality of its own products, INNOSENT also has an efficient QM-system in place. Within this context, INNOSENT carries out device-specific tests accompanying production in compliance with the requirements of the QM-system in order to guarantee the earliest possible detection of defects in its production including the integrated

delivery and performance scopes of the SUPPLIERS. Insofar, the SUPPLIER waives its objection of belated notice of defect.

The INNOSENT part number incl. revision status according to the INNOSENT drawing, must be quoted on the delivery note and the smallest packaging unit. If there is no revision status noted on the drawings, the issue level according to the delivery schedule or order must be quoted.

2.5. Handling of nonconforming output

Unless otherwise agreed with INNOSENT, the SUPPLER shall guarantee conformance to the following requirements:

■ The SUPPLIER must have a documented process for handling of nonconforming output

■ The SUPPLIER must ensure, that nonconforming output is identified and controlled right after detection

■ In case any output produced for INNOSENT is to be recycled or to be scrapped, the SUPPLIER must ensure that this output is rendered unusual and unrepairable prior to disposal

■ The SUPPLIER must not divert nonconforming output to service or other use

■ The SUPPLIER must ensure and verify that all sub-SUPPLIERS will conform to this practice

2.6. Complaints Processing, 8D-Report, NTF (NO TROUBLE FOUND)

8D REPORT

The SUPPLIER shall respond to every complaint within 10 working days using an 8D report:

■ 24 hours: quick response e.g., containment actions at INNOSENT

■ 48 hours: containment actions fully implemented (D3 completed and sent to INNOSENT)

■ 10 working days: root cause analysis done for occurrence and non-detection, permanent corrective actions defined and implemented (D4&5 sent to INNOSENT)

■ 20 working days: effectiveness of permanent corrective actions checked and recurrence prevented (D6&7 sent to INNOSENT)

■ The 10 working days period can be shortened by INNOSENT, if necessary. Interim containment measures must be initiated immediately and reported

■ to guarantee delivery of faultless goods

■ to keep costs for the SUPPLIER and INNOSENT as low as possible

The SUPPLIER shall present interim reports on time on request.

INNOSENT must be informed by SUPPLIER in writing in advance of any possible delays. The SUPPLIER shall analyze the products complained about carefully (defect-cause analysis). He shall summarize the results and planned corrective actions including deadlines for their implementation in an 8D report without delay and forward this to INNOSENT. Proof shall be provided by SUPPLIER to INNOSENT of “effectiveness” of the corrective actions. A root cause analysis always needs to be carried out using suitable problem-solving methods. Detailed analyses (such as Ishikawa, 5 why, error simulations) shall be provided by SUPPLIER.

Subsequent deliveries after a previous fault must be marked accordingly until it has been proven that the fault has been remedied. The type of marking on the individual part needs to be agreed with INNOSENT.

INNOSENT reserves the right to carry out an audit at the SUPPLIER's premises following prior notification, in case of problems caused by the SUPPLIER and unacceptable reaction times, and to charge the costs incurred to the SUPPLIER.

SORTING

Within 24 hours of notification of the complaint, the SUPPLIER must inform INNOSENT about his decision whether to sort, scrap, rework or collect the non-conforming materials ("chosen measures"). He shall then immediately initiate the chosen measures at his own expense. If the SUPPLIER requests the return of the parts by INNOSENT, these costs are passed on to the SUPPLIER.

If the SUPPLIER does not respond to the request within 24 hours, INNOSENT is entitled to make the disposition and is authorized by the SUPPLIER to assign a 3rd party to fulfill the chosen measures on behalf of the SUPPLIER and at his expense. All resulting invoices shall be handled between the SUPPLIER and the 3rd party directly.

Any costs incurred by INNOSENT in connection with the packaging, shipping preparation, and material handling of non-conforming materials will be charged to the SUPPLIER. For clarification, the SUPPLIER shall bear all costs related to the "chosen measures" in case the defective parts relate to a defect caused by the SUPPLIER.

The SUPPLIER is responsible for outside sources (e.g., 3rd parties, which have been assigned by the SUPPLIER or by INNOSENT to fulfill the chosen measures above) and must make all arrangements to ship parts between the affected plant of INNOSENT and the outside source in time. The SUPPLIER shall also be responsible for inspecting and monitoring the quality of sorted parts. Reworked (e.g., deburring) or repaired (e.g., exchange of single component of assembly) parts must meet specifications. The reworking or repairing of parts is not permitted without prior written authorization of INNOSENT.

In case a potentially defect part is delivered at any INNOSENT location and sorting and/or rework is required, only INNOSENT listed and approved contractors (3rd Party) are allowed.

In any case the SUPPLIER is responsible for inspecting and monitoring the quality of sorted parts. He must ensure the 3rd party's compliance with all obligations which apply to the SUPPLIER as well as the preparation of a daily report by the 3rd party which shall be provided directly to INNOSENT.

FIELD FAILURE ANALYSIS / NO TROUBLE FOUND

The investigation procedure for claims from the field as well as for NTF (No Trouble Found) is basically described in VDA Field Failure Analysis & Audit Standard [18] and must be performed according to this.

2.7. Quality Documentation

Documents and records from the product and process development phase as well from the production phase of the delivery item shall be submitted upon demand. In particular, the results of the quality tests and audit results carried out at the suppliers' and at their subsuppliers' shall be recorded including any planned and effectively implemented corrective action, and such shall be provided completely upon demand to InnoSenT or, respectively, to the customer by InnoSent. Any deviations from this procedure shall be agreed upon between the parties already at the time of conclusion of contract. For parts with special characteristics and increased documentation requirements (refer here also to VDA Volume 1 [19] or IATF 16949 [2]), quality records must be stored at the SUPPLIERS' and his sub-contractors' for at least 15 years after EOP.

For all other characteristics, a useful documentation system, as described in VDA volume 1 (documentation and archiving) shall be introduced. Such provisions do not substitute the statutory requirements. It is recommended to keep [records] for a major period of time in view of statutory periods of limitation for product liability claims.

2.8. Quality Agreement and ppm-Management

For the operative implementation of a "zero-error-quality" policy, INNOSENT and the supplier agree upon measurable targets for the supplied quality (ppm-target agreements) with reference to a period of time to be determined.
The ppm-results shall be recorded at INNOSENT, communicated to the supplier and become part of the supplier rating. At the same time, they are the basis of selective measures for continual improvement of quality.
The target setting on ppm values is not an accepted quality level by INNOSENT. All purchased parts which are recognized as defective will not be accepted and will be claimed to the SUPPLIER.

2.9. Change Management / Q-problems

FOR SUPPLIER INITIATED CHANGES

The SUPPLIER shall inform INNOSENT (e-mail to pcn@innosent.de) and the assigned Purchaser as soon as possible, but at least 9 months before carrying out all changes in products and processes, both before and after SOP (Start of Production), e.g. in case of:

- Changes in design, specification and material
- Use of new, modified or replacement tools
- Changes in manufacturing methods or production processes
- Relocation of production within a manufacturing location or to other locations
- Changes in SUPPLIERS of products, components, materials, services or software
- Restart of production equipment after closure of more than 12 months.

The SUPPLIER is also obliged to inform INNOSENT if one of the above points is applicable to a sub-SUPPLIER.

FOR INNOSENT AND SUPPLIER INITIATED CHANGES

INNOSENT reserves the right to carry out tests and a release process before any change is implemented.

In case of changes, which according to the latest IMDS Recommendation 001 require an update of the IMDS data sheet (respectively CAMDS or other national registration systems), those updates need to be provided immediately.

The SUPPLIER defines the scope of new approval tests (initial samples) with INNOSENT. He makes sure that serial production deliveries to INNOSENT are carried out only after the initial samples have been approved by INNOSENT (see section 3.9). The changes are to be documented in the part life cycle.

If old versions still exist at the time the change is made, the SUPPLIER shall inform INNOSENT of the quantities bound by purchasing obligation so that a decision can be taken about their use.

After changes, the first deliveries must be specially marked by the SUPPLIER on the delivery note, containers and parts themselves, if appropriate. Details of this must be agreed in writing between INNOSENT and the SUPPLIER before the parts are delivered.

2.10. CONTINUOUS IMPROVEMENT PROCESS

The SUPPLIER has introduced a structured process of continuous improvement for all products, processes, workflows and services in his company. He can prove that it is used for the products delivered to INNOSENT and the activities connected with this business relationship. Its effectiveness is proved by continuous improvement of the quality performance, prices, delivery performance, flexibility and cooperation. INNOSENT is shown the respective programs and actions for continuous improvement on request.

2.11. PREVENTIVE MAINTENANCE

The SUPPLIER shall employ a defined system for carrying out planned total preventive maintenance. This shall include having replacement parts available for key manufacturing equipment. A maintenance plan must be established and documented which includes the maintenance intervals and the extent of the maintenance.

2.12. SUPPLIER EVALUATION

For selected SUPPLIERS INNOSENT will perform a yearly evaluation based on the performance of the SUPPLIER. As a result of that evaluation the SUPPLIER will be graded into the categories A, B or C. The grading is considered during the decision process whether a SUPPLIER will get new business or not.

2.13. TARGET SETTING

For selected SUPPLIERS INNOSENT will set targets on a yearly base. The target setting will be submitted to the SUPPLIER after the evaluation is done. The SUPPLIER can negotiate the targets in case not achievable with Purchasing. The SUPPLIER has to set up an action plan/improvement plan in order to meet the given targets.

2.14. TRACEABILITY

The SUPPLIER is obliged to guarantee the traceability of the products he supplies.

The products shall be marked or otherwise labeled by SUPPLIER so as to ensure that in the event of a defect being discovered, all other products which could be defective can be identified and blocked until subsequent measures have been agreed between the SUPPLIER and INNOSENT. These requirements must be cascaded down to the complete supply chain.

Product specific traceability requirements will be detailed out in additional documents.

2.15. INFORMATION SECURITY

Supplier must sign the Non-Disclosure Agreement (NDA) before to start any business with INNOSENT.

In case sensitive information needs to be managed INNOSENT is requesting their relevant SUPPLIERS to be certified/labeled in accordance to the valid version of Trusted Information Security Assessment Exchange (TISAX) or Information Security Management ISO 27001 (financial information, intellectual property, employee details or information entrusted by third parties).

3. Requirements for product and process release

INNOESNT's objective is to involve suppliers in quality planning for a new project at the earliest possible stage. INNOSENT always requires systematic planning from our suppliers in the context of project management according to VDA Volume Material Level Assurance (Product Creation – Maturity Level Assurance for New Parts), or AIAG APQP, provided INNOSENT does not stipulate another procedure. This planning applies both to the parts made by the supplier as well as to the supplier's purchased parts.

3.1. FEASIBILITY STUDY

Technical documents (e.g. drawings, specifications, legal/environment requirements, packaging regulations, requirement specification etc.) prepared by INNOSENT or legally mandatory, must be analyzed and evaluated by the SUPPLIER in the context of checking the contract. This check provides the SUPPLIER with the possibility of submitting his experience and suggestions to the advantage of both sides. A feasibility study must be presented to Purchasing, together with the quotation, and is a prerequisite for order placement. Feasibility study must be updated by SUPPLIER for each new/changed drawing.

Please note: The analysis of legal requirements is not limited to pre-defined INNOSENT specifications. Each SUPPLIER is responsible on its own to identify, analyze and comply with all necessary legal requirements (in process validation and series production).

3.2. ADVANCED PRODUCT QUALITY PLANNING

To ensure "zero defect(s) quality" in all phases of the cooperation, the SUPPLIER is obligated to draw up a binding advanced quality plan for prototypes, pre-series samples and serial production deliveries, to document this in test sequence plans (Control Plan) and to coordinate it with INNOSENT.

The Control Plan is in accordance with the requirements of IATF 16949 [2], annex A.

The commitment to "zero defect(s) quality" and therewith to defect prevention as well as to continuous improvement is an essential part of the contract and valid without any acceptance.

3.3. PLANNING CONTENTS

SCHEDULING

The SUPPLIER draws up a project-related schedule based on the deadlines presented by INNOSENT. The schedule is updated regularly by the SUPPLIER during the whole project phase and presented to INNOSENT if requested. Potential deviations from the schedule have to be indicated by the SUPPLIER in good time and agreed with INNOSENT.

WORK-/ PRODUCTION FLOW CHART

The SUPPLIER prepares a production flow chart for the whole process chain. Work plans have to be drawn for all component parts and components. These must contain complete information of process steps, internal and external transportation, means of transport as well as the machinery and equipment used. Manufacturing and raw part drawings as well as process descriptions have to be drawn as required.

RELIABILITY REQUIREMENTS

The reliability requirements contained in the requirement specification/drawing must be implemented with the aid of suitable methods of reliability management and validated based on respective reliability tests and evaluations.

3.4. DESIGN AND PROCESS FMEA

Taking the application of his products at INNOSENT and INNOSENT´s customers into account, the SUPPLIER shall carry out preventive risk analysis (FMEA) for all products delivered to INNOSENT and the processes linked with these and updates the FMEA whenever deviations of product and/or process quality occur as well as when changes are made as described in section 2.9. All parameters affecting product safety must be integrated in the analysis. Points evaluated as critical must be improved in the short-term by means of suitable corrective and preventive actions to enable specifications, properties and product safety as well as capable manufacturing to be guaranteed. To implement the actions, deadlines, and responsible persons have to be named and proved if required.

Independently of the design- and process-FMEAs prepared on his own responsibility, the SUPPLIER agrees to cooperate in the system or interface FMEAs initiated by INNOSENT. Results must be taken into account in the SUPPLIER’s further development process. The SUPPLIER shall make the Process-FMEA available for review on INNOSENT’s request. On demand a reverse FMEA must be performed.

Details are defined in AIAG & VDA FMEA-Handbook [24] . Results must be recorded as described in section 2.7 “Quality Documentation”.

3.5. CONTROL PLAN

Within the Control Plan, the results of the Design-FMEA, Process-FMEA, experience with similar processes and products as well as the utilization of methods of improvement have to be considered.

Based on the Control Plan, the SUPPLIER assures compliance with all the routine tests, taking the agreed measurement and inspection equipment as well as the sampling scheme into consideration.

The Control Plan must also include all necessary actions to comply with the legal requirements (in EU/ECE regulations called "Conformity of Production"). This is compulsory for legal requirements which have to be identified both by INNOSENT and by the SUPPLIER at his own responsibility.

The Control Plan and all other related documents (records of part and process approvals as well as inspection results) have to be provided to INNOSENT on request.

3.6. PLANNING SERIAL PRODUCTION

The planning of lines and operating equipment includes the planning and manufacturing/procurement of all the operating equipment required to produce the component. The capability or suitability of operating equipment must be proved. Capabilities must be proved individually for multiple jigs or molds. Care must be taken that operating equipment in sufficient capacity and function is available at the latest when off-tool parts are produced at the sampling date. Internal and external means of transport and packaging must also be taken into consideration.

COORDINATION OF SERIAL MONITORING

All product and process characteristics are important and must be kept in a reliable process. Special characteristics require the proof of process capability. For this purpose, the SUPPLIER shall use suitable methods e.g., quality control cards (SPC) to monitor these characteristics. If process capability cannot be proven, a 100% test must be carried out. Characteristics that cannot be measured or only measured in a destructive test must be monitored and documented using suitable methods.

BOUNDARY SAMPLES

Where necessary, boundary samples must be agreed between INNOSENT and the SUPPLIER. In the case of decorative parts, this is obligatory.

3.7. CAPABILITY OF TESTING EQUIPMENT, MACHINES AND PROCESSES

By applying suitable statistical procedures, the SUPPLIER shall guarantee that the used machines, tools, measuring and test equipment as well as the processes in which these are introduced are suitable and capable for the production of products supplied to INNOSENT.

The characteristics for which capability studies have to be provided will be agreed between INNOSENT and the SUPPLIER.

However, this does not release the SUPPLIER from his responsibility of defining further characteristics related to his processes or characteristics of the sub-SUPPLIERS.

CAPABILITY OF TESTING EQUIPMENT

For all characteristics, the SUPPLIER defines the testing method with the appropriate testing equipment. For the planned measuring equipment a suitability of the test-process has to be proven. The measuring process and the tolerances of the characteristic to be measured has to be considered for this.

Proof has to be brought in accordance with the requirements of VDA Volume 5 [24] (test process suitability) or AIAG [11].

PROOF OF MACHINE AND PROCESS CAPABILITY

The investigation of machine capability and process capability are basically described in VDA Volume 4 Part [23] and must be performed according to this.

For all agreed special characteristics, the following capability indices are binding:

Short-term/machine capability index: Cmk ≥ 1.67

Note: here, a large number of random checks is taken and evaluated within a short period of time.

Preliminary process capability index: Ppk ≥ 1.67

Long-term process capability index: Cpk ≥ 1.33

Note: here, smaller numbers of samples are taken and evaluated over a longer period.

If these minimum requirements are not met, 100% tests must be carried out until the capability is achieved through corrective actions. Deviations from this must be agreed with INNOSENT.

In certain cases, the following capability indices can be agreed for special characteristics or process parameters:

Short-term/machine capability index: Cmk ≥ 2.0

Preliminary process capability index: Ppk ≥ 2.0

Long-term process capability index: Cpk ≥ 1.67

3.8. STATUS OF SUB-SUPPLIERS AND THEIR PRODUCTS

The use of sub-SUPPLIERS that meet the quality requirements as well as the environmental, health and safety requirements and those arising from the INNOSENT CODE OF CONDUCT

FOR SUPPLIERS AND SERVICE PROVIDERS [31] has to be guaranteed for the project and is the responsibility of the SUPPLIER. In case of nonperformance, sub-SUPPLIER development programs have to be set up. Implementation must be guaranteed before the start of series deliveries at the latest.

The status of quality planning for purchased parts must be reported regularly. The production process and product release of products from sub-SUPPLIERS has to be concluded before production process and product release of INNOSENT SUPPLIERS.

3.9. PRODUCT AND PROCESS RELEASE

INITIAL SAMPLES

For product release, the SUPPLIER is obligated to submit initial samples to INNOSENT before the start of serial production; these samples must comply with all the specifications and properties specified in the contract:

■ Dimensions (GD&T Geometrical Dimensioning and Tolerancing regulations must be followed)

■ Materials and processing

■ Applications/functional interface

■ Boundary samples

Unless agreed otherwise, this proof must be brought on at least 5 parts/cavity.

This allows any deviations to be corrected in good time, thereby preventing systematic errors in serial production.

PRODUCTION PART APPROVAL PROCESS

Without part and process approval any series deliveries are forbidden. Initial samples and all component parts and materials used for their production, have to be produced under series conditions with series equipment without any exception. Reference samples from initial sampling must be kept by the SUPPLIER for at least 15 years after EOP, unless otherwise agreed in writing. If necessary, boundary samples (e.g., photometric samples) must be regularly updated in agreement with INNOSENT.

The content and complexity of necessary documents must be discussed with the INNOSENT Purchasing department for the specific project. The IMDS MDS or equivalent MDS submission by the SUPPLIER is mandatory.

It has to be decided in advance which bases for initial sample reports have to be used: VDA, Volume 2 [25] or AIAG documents [11]. The respective submission level must be defined.

The alignment points given on the drawing must always be considered. If the INNOSENT drawing does not contain this information, the alignment points determined during measurement must be recorded by the SUPPLIER in the release documentation (ISIR/PSW).

SERIAL PROCESS RELEASE

The process release at the SUPPLIER's is granted when a process audit according to VDA Volume 6 Part 3 [5], has been passed successfully with rating A, as well as after a Full-Run capacity test passed according to INNOSENT guidelines. The duration of the Full-Run has to last minimum one shift. The duration can be reduced in agreement with INNOSENT SQA-department. The result of the Full-Run conducted by the SUPPLIER has to be attached to ISIR/PSW.

A process release can also be granted in the case of a B rating. An improvement plan must be drawn up and processed for the open points.

INNOSENT reserves the right to carry out the process audit and Full-Run test, or request the results of the process release, at the SUPPLIER's and at the sub-SUPPLIER's if necessary.

For standard parts as well as products for the aftermarket, releases can be agreed based on "SUPPLIER data sheets" upon request and requirement by INNOSENT Purchasing. Only products for the aftermarket can be exempted from the requirement to submit IMDS MDS or equivalent MDS upon agreement by INNOSENT Purchasing.

SAFE LAUNCH

With start of the Production Part Approval Process (PPAP acc. to AIAG [11]) / Production process and product approval (PPA acc. to VDA Volume 2 [25]), and latest with the start of serial production, the SUPPLIERS should participate in Safe Launch Planning under the direction of their assigned SQA.

5.11 FUNCTIONAL SAFETY

As far as the scope of the SUPPLIER's product development tasks for parts that can be either electronic components, SW component, assemblies or complete devices including SW and HW

development, the SUPPLIER shall in particular comply with the requirements of “Functional Safety” according to ISO 26262 [26] (FuSa).

On INNOSENT’s request Organization-specific rules and processes for functional safety and Evidence of competence at Supplier shall be provided in writing in a standard form as applicable.

5.12 QUALITY REQUIREMENTS FOR DEVELOPMENT OF EMBEDDED SOFTWARE

The term „software“ refers to the software-related services and deliveries that are specific for Automotive Industry and are expected to be developed according to automotive state-of-the-art standards for system and software engineering. SUPPLIERs shall understand the term “software” as vehicle-related and vehicle-integrated software that includes the following:

■ Software embedded in hardware components (e.g., embedded system applications, hardware abstractions, operating, system)

■ Software as a stand-alone product or service

4. Methods of Supplier Escalation

4.1. Escalation Process for Suppliers

In case of repeated quality or logistic problems (e.g. unsuccessful complaint management of the SUPPLIER, long-term and/or multiple cases of missed target agreements, customer complaints due to defective purchased parts, …) at the SUPPLIER’s, the INNOSENT escalation process will apply. The aim of the process is to implement suitable actions at the SUPPLIER’s so that the products and materials delivered meet INNOSENT requirements again. Depending on the duration and seriousness of the problems, they are classified in one of three escalation levels.

The basic procedure for each level is as follows:

■ Analysis of the escalation cause and of the problem

■ Agreement on an action plan to eliminate the causes of the escalation, in order to bring back the quality in line with targets

■ Implementation of the action plan

■ Monitoring/tracking of the action plan

■ Depending on the effectiveness of the actions, either escalation or de- escalation takes place to the next level

If the subjects and actions are not processed efficiently by the SUPPLIER, INNOSENT retains the right to compel the SUPPLIER to obtain external help from a competent service provider.

Escalation level 1: Escalation level 1 is activated when the problems cannot be processed satisfactorily within the scope of normal workflow. In the course of the escalation process, the SUPPLIER has to set up an effective problem-solving process and present this to the Quality department of INNOSENT regularly on site.

Escalation level 2: In escalation level 2 the action plan is monitored on site at the SUPPLIER’s to make sure it is adequate and effective. This shall take place within the context of quality and/or logistics audits. The results of the onsite analysis are documented in an action plan. The SUPPLIER

is responsible for implementing the actions and has to report to those responsible about the respective status at regular intervals.

Escalation level 3: If the quality requirements in escalation level 2 are not fulfilled, the SUPPLIER is classified under escalation level 3. This means the SUPPLIER is blocked for new inquiries and placement of orders for INNOSENT. INNOSENT also reserve the right to forward the information to the SUPPLIER's certification authority.

At escalation level 3 the existing problems are analyzed by a INNOSENT team on site. The SUPPLIER must be prepared to support all activities of the INNOSENT team. The SUPPLIER's general management must ensure the compliance with all the actions agreed. In order to guarantee the implementation and effectiveness of the planned actions, progress is supervised and documented based on regular reviews.

Escalation level 3 ends with de-escalation. If a SUPPLIER support project does not run successfully and the reason for this is caused by the SUPPLIER, a re-positioning of this SUPPLIER in the portfolio of INNOSENT Purchasing will take place.

INNOSENT reserves the right at escalation level 2 and 3 to charge costs (e.g., audits, expert support, …) caused by the escalation to the SUPPLIER.

5. SPECIFIC REQUIREMENTS FOR ELECTRONIC COMPONENTS

5.1. RELEASE OF ELECTRONIC COMPONENTS

The following proofs are to be provided by the SUPLLIER for all new electronic components to be introduced at INNOSENT:

■ Successful implementation of the release test according to the qualification requirements of the Automotive Electronic Council (e.g., AEC-Q100/101/102/200) [27, 28, 29, 30] (more detailed tests must be carried out in addition if required)

■ Complete proof methods according to PPAP level 3

5.2. PROOF OF PROCESS CAPABILITY

Process capabilities, in accordance with section 5, must be proven for electronic components for all functional-, safety- and quality- related processes. In addition, the use of statistical methods such as Part Average Test and Statistical Bin Analysis are a prerequisite to support the zero defect(s) strategy.

6. Information

6.1. Quality Losses

If, while checking the products supplied to INNOSENT, the supplier detects an increase in detrimental deviations concerning features or reliability, in particular in terms of requirements (2.3, 2.4, 3.5, 3.8), he shall advise INNOSENT immediately about that and about corrective action,

e.g. improvement of manufacturing procedures, materials, parts, inspection procedures or test equipment.

7. Deliveries

If INNOSENT feels compelled to recall and exchange products and/or already fitted components from its customers – in cases of proven quality defects for which the supplier is responsible - , and /or to re-work such products or components on site or in its company, the supplier shall be charged with the costs up to a maximum amount.
INNOSENT shall advise the SUPPLIER immediately on the quality defects which have occurred.

8. APPLICABLE DOCUMENTS, LITERATURE AND ABBREVIATIONS

[1]	ISO 9001	Quality management systems – Requirements
[2]	IATF 16949	Quality management system requirements for automotive production and relevant service parts organizations
[3]	ISO 14001	ISO 14001 Environmental management systems - Requirements
[4]	ISO 45001	ISO 45001 Occupational Health and Safety Management Systems - Requirements with guidance for use
[5]	VDA Volume 6 Part 3	Process audit
[6]	VDA Volume 6 Part 5	Product audit
[7]	VDA Volume 6 Part 7	Process audit
[8]	DIN EN 10204	Metallic products – Types of inspection Documents
[9]	MAQMSR	Minimum Automotive Quality Management System Requirements for Sub-Tier Suppliers – Sections of IATF 16949 selected for supplier QMS development
[10]	VDA Volume 6 Part 1	QM-system audit serial production
[11]	AIAG	Automotive Industry Action Group manuals: Advance Product Quality Planning and Control Plan (APQP) Measurement System Analysis (MSA) Potential Failure Mode Effects and Analysis (FMEA) Production Part Approval Process (PPAP) Statistical Process Control (SPC)
[12]	VDA Product Integrity	Product Integrity - Recommended action for organizations regarding product safety and conformity
[13]	ISO 14040	Environmental management — Life cycle assessment — Principles and framework
[14]	ISO 14044	Environmental management — Life cycle assessment — Requirements and guidelines
[15]	(EC) No. 1907/2006 (REACh)	EU Regulation concerning the Registration, Evaluation, Authorization and Restriction of Chemicals
[16]	2000/53/EC (ELV)	EU-Directive on End of Life Vehicles
[17]	2011/65/EU (RoHS)	EU-Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment
[18]	VDA Volume	VDA Field Failure Analysis & Audit Standard
[19]	VDA Volume 1	Documented Information and Retention
[20]	VDA Volume	Maturity Level Assurance for new Parts

[21]	VDA Volume 3	Reliability Assurance
[22]	FMEA-Handbook	AIAG & VDA FMEA-Handbook
[23]	VDA Volume 4	Quality Assurance in the Process Landscape
[24]	VDA Volume 5	Capability of Measurement Processes
[25]	VDA Volume 2	Quality Assurance for Supplies Production process an and product approval PPAP
[26]	ISO 26262	Road vehicles – Functional safety
[27]	AEC-Q100	Failure Mechanism Based Stress - Test Qualification for Integral Circuits
[28]	AEC-Q101	Failure Mechanism Based Stress Test Qualification for Discrete Semiconductors
[29]	AEC-Q102	Failure Mechanism Based Stress Test Qualification for Discrete Optoelectronic Semiconductors in Automotive Applications
[30]	AEC-Q200	Stress Test Qualification for Passive Components
[31]	INNOSENT Regulation SCoC	Code of Conduct,for suppliers and service providers

(Place / Date)

(Signature)

(Name in Block Letters)

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