Hirschmann Car Communication

SUPPLIER QUALITY GUIDELINES
(LIEFERANTENLEITFADEN)

of

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1 INTRODUCTION

1.1 Definitions

2DP	Two days production audit
8D	Eight Disciplines – Problem Solving Process/Report
AA	Application Approval
APQP	Advanced Product Quality Planning and Control Plan
CA	Component Approval
CFE-Q	Supplier Quality Management at HCC
CMK	Machine capability
CPK	Process capability index
CSL1/2	Controlled Shipment Level 1/2
Customer	any Customer HCC delivers parts to, directly or indirectly.
DMAIC	Define, Measure, Analyze, Improve, Control (SixSigma)
DOE	Design of Experiments
FMEA	Potential Failure Mode and Effects Analysis
FPY	First Pass Yield
GADSL	Global Automotive Declarable Substances List
HCC	(i) Hirschmann Car Communication GmbH (ii) any Related Company of Hirschmann Car Communication GmbH (iii) any Electronic Manufacturing Service awarded by Hirschmann Car Communication GmbH or Related Company.
IMDS	Automotive Industry Material Data System
ISO	International Standards Organization
ISO/TS ISO	Technical Specification
MA	Manufacturing Approval
MSA	Measurement Systems Analysis
NFF	No Failure Found
PCN/ECN	Product or Process Change Notification/Engineering Change Notification
PDF417	2D-Code for package label description based on ISO/IEC 15438
PTN	Product Termination Notification
PPAP	Production Part Approval Process (QS-9000)
PPF	Production Process and Product Release (Produktions-Prozess und Produktfreigabe (VDA Volume 2)
PPM	Parts Per Million
PSW	Part Submission Warrant
QA	Quality Agreement/Supplier Guideline
QM	Quality Management
QPR	Quality Process Requirements
QSA	Quality System Assessment
Related Companies	Any company which, through ownership of voting stock or otherwise, directly or indirectly, is controlled by, under the common control with, or in control of a Party hereto, the term "control" meaning the ownership of more than 50% of such company's voting rights.
Run@Rate	Audit performed under serial production circumstances
RPN	Risk Priority Number
SA	Supplier Approval
SLC	Safe Launch Concept
SPC	Statistical Process Control
SPSR	Supplier Pre Sourcing Review
Supplier	(i) the legal entity who delivers itself and / or (ii) any Participating Related Company/ Companies of the legal entity who delivers
VDA	German Automobile Association

1.2 Purpose

The purpose of this document is to communicate the HCC requirements with respect to the quality and environmental management system of those companies that supply production goods and /or services to HCC.

With regard to its deliveries, the Supplier must comply with the provisions of this QA. Furthermore, the Supplier is obliged to ensure that all quality rules set out in this agreement are transmitted, implemented and committed to by the members of Supplier's sub-supplier panel. Exceptions and changes to this QA shall only be valid if made in writing and signed by both parties.

HCC expects zero defect quality for every quoted contract-product and a commitment from its suppliers to implement appropriate systems and controls to ensure the 100% on-time delivery of conforming, defect free products.

1.3 Background / Area of Application

HCC Supplier Quality and Environmental System Requirements are based upon the latest edition of ISO/TS 16949 Quality System Requirements and ISO 14001 Environmental System Requirements.

Although this does not alter or reduce any other requirements of the contract, it is intended to provide a concise understanding of our quality and environmental expectations.

By signing this QA the Supplier hereby acknowledges that this QA applies to all components and services supplied by it to any HCC location world-wide.

Beside the conditions of this Quality Agreement, the supplier expressly warrants to HCC that all work and Contract Products are free of faults and appropriate for the usage agreed between the Parties. In addition, the Supplier warrants that they are conform to and satisfy the drawings, specifications and samples or other descriptions furnished, specified or approved by HCC as well as applicable safety and environmental rules or regulations in the countries where contract products or vehicles equipped with Contract Products are to be sold or used, including those of EU/EFTA/NAFTA (e.g.: End of Life Directive, REACH …) in its current versions as amended from time to time.

1.4 Validity

Any new version and or amendment of the QA shall become applicable upon written agreement between the Parties and shall replace the respective old version.
In case of conflicting rules between the rules of this Agreement and any other agreement / document, the order of precedence of the documents is as follows:

1. Outline Agreement
2. Sourcing Agreement, component specification / drawing
3. Quality Agreement (QA)

2 GENERAL SYSTEM REQUIREMENTS

2.1 Management System Requirements

Present and potential suppliers to HCC must operate within a comprehensive quality system.

Suppliers are obligated to install and maintain environmental systems in their facilities that are compliant to the current versions of ISO / TS 16949 and ISO 14001. The Sup-

plier must submit a valid certificate from an accredited certification body (3rd party audit).

Suppliers who are not certified must have a working plan to become compliant to ISO/TS 16949 and ISO 14001 available for review, unless the supplier has an approved Supplier Quality Certification Exemption from HCC waiving such a plan.

Certified suppliers must record their initial and renewal certifications towards HCC within 10 days of receiving the certificate from their registrar. Also, Suppliers are obligated to submit the Certificates to all HCC receiving sites and the Purchasing department and notify the same within 24 hours, when the certificate will be suspended by their registrar.

2.2 Sub-Supplier Control

The requirements set out in this Agreement shall also apply to the QM-System that the Supplier shall set up with its sub-suppliers. The Supplier shall obligate its sub-suppliers and their subcontractors accordingly. Upon HCC request the Supplier shall submit supplier- and product approvals and corresponding quality contracts with its sub-suppliers.

The Supplier shall notify HCC of any changes to their approved vendor list and request HCC's approval. Unless written approval of HCC has been obtained, the shipment of any components impacted by the change to HCC is not permissible.

Each supplier is responsible for the control and continuous improvement efforts of sub-suppliers. That responsibility as well applies to sub-suppliers nominated by HCC. Suppliers shall enable visits by HCC at their suppliers premises.

2.3 Audits

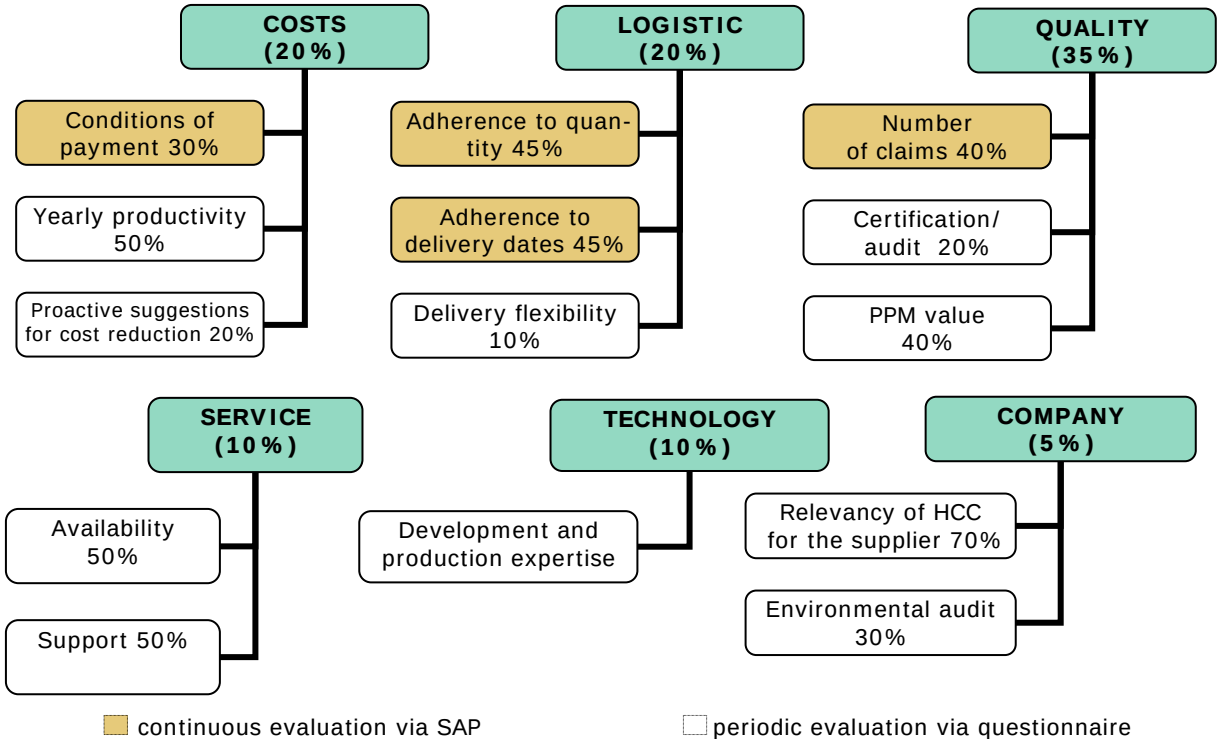
Upon request of HCC, a 3rd party representative or Customers shall be entitled to visit any product related location of the Supplier and to conduct audits on the basis of ISO/TS 16949 and VDA standards. This right shall also include audits at the Supplier's sub-suppliers' locations. The Supplier shall provide the necessary resources for the performance of this task. The Supplier is, however, not obligated to reveal any proprietary information without a mutual non-disclosure-agreement in place.

A scoring and audit report will be provided by the respective auditor at the end of an audit during the common wrap-up discussion with the involved participants. The audit report and the necessary measures resulting from the audit (as far as identifiable) shall be agreed upon by the Supplier and HCC within an action plan. The tracking and follow-up for the realization of the action plan will be performed by HCC's auditor.

Each year, the Supplier shall perform a self audit according to VDA 6.3 standard for all product lines including subcontracted processes. HCC shall be informed of all audit results with an B or lower ranking. Upon request of HCC the Supplier shall provide all audit results including documentation and action plans.

2.4 Supplier Performance Indicators and Rating

HCC performs a supplier evaluation in several categories based on key performance indicators such as:

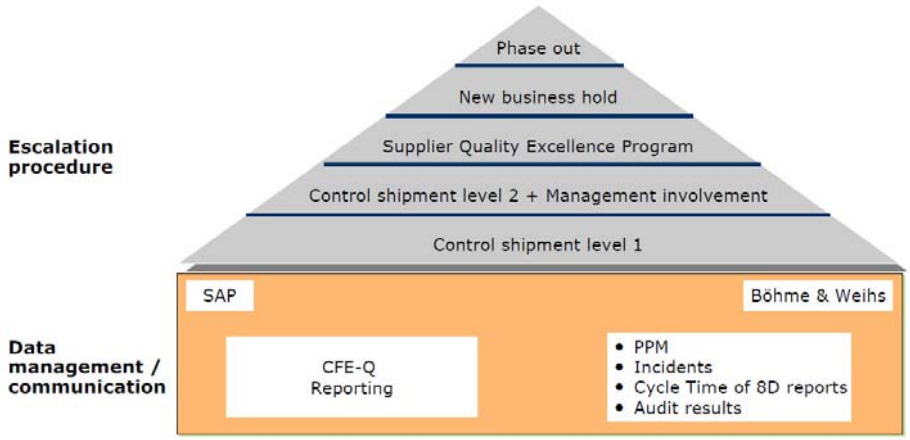


The global performance of the Supplier will be evaluated annually for purchasing, quality, logistics and technology elements and serves to determine HCC strategic supply base.

Based on the results of such evaluation the Supplier shall define and implement appropriate corrective actions. If the quality results fail to meet the committed goals, the Supplier shall implement immediate corrective actions to reach the targets.

Suppliers are obligated to monitor their performance on the future Internet Portal of HCC.

2.5 Escalation Process



An escalation process is launched in case of non satisfying supplier performance (ppm, number of incidents, 8D leadtime and audit results).

Based on the request from HCC, the Supplier shall enable a visit from HCC or a meeting within 48 hours after receipt of the complaint.

a. Incident escalation
As entry criteria into the escalation an 8D report from the supplier is mandatory. Based on the 8D report and an expert meeting the supplier could be set to CSL1 in order to prevent re-occurrence of the same failure.

In case of CSL1 the Supplier shall apply additional / redundant testing to prevent shipping of nonconforming components to HCC. The testing process shall include a 100% screening. The screening shall be applied to all components at the Supplier's location, in transit, or at HCC's plant. The Supplier shall absorb all costs related to these containment actions and report the status and results to HCC.

CSL2 may be applied independently from CSL1 based on HCC request. The application of CSL2 shall be mandatory if a failed part is delivered during CSL1. In case of CSL2 the Supplier shall hire an independent third party to perform the containment actions and to support the related 8D process.

Components shipped under CSL1 or CSL2 shall be marked with a mutually agreed upon identification method.

With the setup of CSL 1 or CSL 2, exit criterias will be defined by HCC.

b. Supplier ppm targets not achieved or worst five supplier
HCC review on a regular base the ppm status of their supplier and review in detail on a monthly base the worse fixe suppliers in terms of ppm level and incidents.
As entry criteria into the escalation process an action plan from the supplier is mandatory. Based on the action plan and an expert meeting the supplier could be set to CSL1. If there is no progress concerning the actions agreed, a management meeting shall be conducted and based on the results the supplier could be set to CSL2.

CSL1 or CSL 2 can be used as containment action.

c. Supplier Quality Excellence Program
A Supplier Quality Excellence Program can be launched to support the improvement plan. This Program contains regular management meeting with the following agenda:

- Review of FPY and ppm of last 12 months
- Review pareto diagramm
- Review of corrective actions out of pareto diagramm and customer complaints
- ‚Go and see'
- Attendees: Supplier quality engineer, buyer, head of purchasing + Management from supplier

- Optional measures
  - Resident engineer
  - Control shipment level
  - Involvement of external specialist/institutes
  - Regular reporting of FPY, Cpk
  - etc.

d. Top Management Meeting, New Business on Hold, Phase-Out
In case that CSL1/2 failed or the Audit result has been ranked with B or the supplier evaluation results have been insufficient, a Top Management Meeting will be organized. The output of the meeting could lead to the decision "New Business on Hold" or "Phase-Out".

2.6 Record Retention
The Supplier shall be obligated to document and maintain Production Part Approval Process (PPAP) packages, annual layout and validation records, tooling records, traceability records, engineering records, corrective action records, quality performance records and

inspection and test results. In minimum the listed documents shall be archived over at least 15 years after the production has been terminated and tooling scrap authorization has been granted. Records shall be made available to HCC upon request.

The above time periods are considered “minimum”. All retention times shall meet or exceed the above requirements and any governmental requirements.

2.7 Declarable Substances

The supplier guarantees and warrants that all products worldwide supplied to HCC are in compliance with the substance and material restrictions specified in the "Global Automotive Declarable Substances List" (GADSL). GADSL is available under the following internet address: http://www.gadsl.org

The supplier is obliged to declare all substances listed as "declarable" or "prohibited" like specified within the GADSL. The complete composition of components and materials shall be declared in the "International Material Data System" (IMDS) and has to be accepted by HCC.

The IMDS access is available under the following internet address: http://www.mdsystem.com.
A proof of the IMDS Data Input shall be provided with the IMDS material data ID number in the respective PPAP/ PPF documents.

2.8 Contingency plans

Suppliers are obligated to prepare contingency plans (e.g. utility interruptions, labor shortages, key equipment failure and field returns) to reasonably protect HCC's System’s supply of product in the event of an emergency, excluding Acts of God / Force Majeure.

3 ADVANCED QUALITY PLANNING

3.1 Feasibility Commitment, Supplier Pre Sourcing Review (SPSR)

With each offer to HCC, the Supplier shall submit a feasibility commitment with regard to project time plan, quality targets and technical requirements.

The Supplier shall perform a detailed feasibility analysis for critical and important criteria to be presented during a "Supplier Pre Sourcing Review Meeting".

The main output of this meeting has to be a feasibility commitment to a common agreed project time schedule, a common agreed (target) specification/drawing, a fixed supply chain and an annual PPAP agreement.

3.2 Advanced Product Quality Planning (APQP)

Supplier and its sub-suppliers shall have a comprehensive APQP process in place in accordance to the latest HCC demands. The Supplier shall maintain APQP based on latest HCC requirements for each component development project.

Based on these requirements, the supplier is obliged to give HCC the opportunity to verify the APQP process at the Supplier as well as at the sub-supplier's premises together with it's customer.

The Supplier shall designate a project engineer / manager for each component development project, who will be available upon request by HCC to be part of the overall project team.

3.3 Engineering Prototype Sample Submission

Engineering prototype parts with documentation of specification conformance shall be submitted to HCC by the supplier as instructed by the department at HCC responsible for prototype and engineering validation testing. Each sample or prototype must be clearly

labelled as such and accompanied by completed dimensional results, material test results, and performance test results reports. Specific instructions, in addition to these stated requirements, may be agreed upon and documented by HCC via the APQP Kick-Off Meeting or other formal communication.

3.4 FMEA

The Supplier shall conduct a FMEA before design validation according to accepted technical standards.

The FMEA shall:

(a) recognize and evaluate the potential failure of a design/process and the effects of that failure,
(b) identify actions that could eliminate or reduce the chance of the potential failure occurring, and
(c) document the entire process.

All identified potential failure modes shall be considered in order to improve the product/process.

Supplier shall set up a rating system in its QM-system which identifies the priorities of recommended measures (e.g. RPN, Severity).

The first release of the FMEA shall be transmitted to HCC before design validation. Each event or change shall be updated in such FMEA. The process FMEA shall be delivered to HCC, the design FMEA shall be made available to HCC for inspection.

3.5 Special Characteristics

Special Characteristics are any product characteristics defined by HCC or Customers or manufacturing process parameters identified by the Supplier including government and safety regulations, which have a substantial influence on the:
- manufacturability at HCC
- manufacturability at the Customer
- usage and operation of the product by the Customer
- compliance with applicable regulations
- compliance to applicable safety requirements

Special Characteristics are further categorized into:
- Characteristics not relating to safety or legal considerations
- Characteristics with safety or legal considerations

In accordance with the requirements of ISO/TS 16949, Special Characteristics shall be identified and specifically addressed in the Design-FMEA, Process-FMEA, Control Plans, Process Flows, work instructions and other associated documents.

HCC required Special Characteristics will be identified on drawings/specifications or in a separate document that cross-references these characteristics to the drawings/specifications. The supplier is responsible to fully understand the process impact to their product and identify any process parameter Special Characteristics as they deem appropriate. Suppliers are also responsible for ensuring that relevant Special Characteristics are explained, understood and controlled by their sub-suppliers where applicable.

3.6 Qualification

The Supplier shall maintain a qualification system for processes and components which are capable of proving the requirements as defined in the HCC's specifications.

3.7 Manufacturing Process Review

The supplier is responsible to carry out reviews in his area of responsibility. They must be scheduled in such a way that the results are available on the specified release days

(milestones) of the project. An assessment of a supplier's manufacturing process may be conducted before and after part approval at the supplier's facility. This assessment may be specified by HCC or its Customer (e.g. Run@Rate/2DP and VDA 6.3 Audit).

3.8 Production Part Approval Process (PPAP)

The Supplier shall conduct the PPAP according to the date specified. PPAP shall determine whether all HCC engineering design requirements, specification requirements and process requirements are met by the Supplier and that the process has the defined capability to produce components meeting these requirements during an actual production run at the quoted production rate. The standard PPAP submission level shall be 3, unless otherwise agreed. Upon request by HCC, the PPF requirements as referenced in the VDA volume 2 manual shall be used. PPAPs shall be submitted to the requesting quality department and any associated PPAP sample parts shall be clearly labelled as such.

3.9 Product and Process Release Information

The Product and Process is released after a PSW has been countersigned by HCC CFE-Q. Changes of the process or product are not allowed after this point without prior notification to HCC and a release by HCC. Supplier's components shall not be accepted by HCC for series production in case a product release has not been issued. Any production shipments received by HCC prior to obtaining this approval will be rejected. The product release shall only be issued if Supplier's product, process line and manufacturing site have been approved for series delivery.

In case a full approval cannot be achieved on time a written deviation approval is required prior to shipping parts to HCC for production. HCC shall inform the Supplier of such product release.

Before a component is released for series production at HCC, four (4) approval steps must be completed:

(1) Component Approval (CA) is given with the countersigned PSW as described above.

(2) Supplier Approval (SA) will be granted if -at a minimum- the following steps have been successfully completed:

- Evaluation of the Supplier's QM-System
- Audit
- Fulfillment of APQP requirements
- Pre-production capacity audit if appropriate (Run@Rate/2DP, etc…)
- Agreement on QA and related documents (required before sourcing decision).

(3) Application Approval (AA): Application specific tests (HCC responsibility).

(4) Manufacturing Approval (MA): Manufacturing specific tests (HCC responsibility).

4. RAMP UP PROCESS

4.1 Pre-Production and Sample Part requirements

Suppliers are obligated to meet HCC's Pre-production and Sample Part requirements. These requirements will be defined by HCC via the APQP Kick-Off Meeting or other formal communication. Required documentation (e.g. Control Plans) must be kept current.

Suppliers shall clearly label "pre-production parts" or "sample parts" to ensure that HCC's receiving site does not mix such parts with "regular" production parts. Suppliers are also expected to work closely with HCC plant Scheduling and Material Control personnel to minimize unnecessary obsolescence.

Labelling must be done per HCC's receiving site requirements and shall be differentiated from regular production shipping labels, unless the parts are already PPAP approved. In particular, the Supplier Identification, Part Number, Engineering Level, and Quantity

must be clearly displayed on the part-packaging label to ensure easy, visible segregation of containers/parts.

4.2 Safe Launch Concept (SLC)

The Supplier shall apply the SLC according to the product and process maturity. The scale of the SLC shall be defined during the APQP process and agreed upon with HCC.

The purpose of the SLC is to document the Supplier's control of its processes during start-up and ramp-up phase. It shall also enable the Supplier to quickly identify and quickly correct any quality issues that may arise at the Supplier's location. SLC includes special verifications performed by the Supplier for a defined timeframe or quantity as determined together with HCC in the APQP process.

SLC requires a Pre-Launch Control Plan, which is a significant enhancement to the Supplier's production control plan and which in turn will raise the confidence level to ensure that all components shipped initially will meet HCC's expectations. The pre-launch control plan will also serve to validate the production control plan.

The Pre-Launch Control Plan shall take into consideration all known critical conditions of the product as determined with HCC as well as potential areas of concerns in the Supplier’s process as also identified during the introduction and PPAP.

The Supplier shall generate the Pre-Launch Control Plan prior to start of series production and shall make it available to HCC for approval prior to start of series production. HCC shall be entitled to request changes.

Suppliers are obligated to submit inspection data to HCC's plant. This should include variable measurement data where applicable. Suppliers may exit new production containment if they have achieved SLC targets unless otherwise specified by HCC. Suppliers shall develop action plans to address missed failure modes or capability improvement needs.

HCC may require suppliers to perform production on stock for product and process verification purpose.

Missing achievement of the SLC targets within the mutual defined period of time or quantities may lead to a withdrawal of the release.

5 SERIAL PRODUCTION

5.1 Deviation Approval for Product or Process Deviations

HCC is entitled to refuse acceptance of products that do not meet the requirements of the applicable drawings and specifications. Requests for deviations on nonconforming products shall be submitted to HCC's receiving plant for review and approval prior to shipment. Deviations shall be approved only for a specific time period or specific quantity of parts. No permanent deviations are permitted. A deviation request shall be accompanied by a Problem Solving Report (8D). This report shall include the identification of a clean point and the manner in which products will be identified, including how traceability will be maintained.

5.2 Process Capability and Control

Suppliers are obligated to meet the process capability requirements. Acceptance criteria for an initial process study is a cpk >= 1.67 and machine capability cmk >= 2 (Pa = 99 %) for new introduced components. The supplier is responsible for seeing that control requirements are documented in the control plan and that capability indices are achieved and improved throughout production. If the required capability cannot be reached then 100% testing is mandatory.

The Supplier is obligated to define samples ("golden" samples) to be used as reference for the manufacturing process and final product. Upon request of HCC the Supplier shall provide HCC with measurement and traceability data for special characteristics.

The Supplier shall inform HCC about any deviation of the current reading of the First Pass Yield (FPY) from the average weekly FPY of more than ±10% for any product within two days after the deviation occurred. The Supplier shall provide information regarding the current and past FPY upon request of HCC.

Without the prior written approval of HCC the Supplier shall not repair or sort out components. Rework/repair includes all activities on components outside the continuous process flow.

5.3 Annual Re-Qualification

The Supplier shall re-qualify its components in case of changes and regularly at least once a year. A qualification-monitoring program for reliability and environmental tests has to be maintained in order to ensure and demonstrate that the delivered components meet all the agreed requirements. Re-qualification documentation shall be archived by Supplier and shall be made available to HCC upon request.

In case that the Supplier does not have design-responsibility the Supplier shall perform a lay-out inspection, verifying all characteristics as specified in the respective drawing or specification on a regular basis, at least once a year.

Suppliers with PPAP documentation over one year old are obligated to re-PPAP as directed by HCC's receiving site Quality department.

5.4 Certificates of Conformance

Upon request a signed certificate of conformance shall be maintained on file at the supplier and may be required to accompany each shipment of specified components or materials. The certificate of conformance must contain the actual results of physical testing, measurements and/or analysis specified by the contract confirming compliance with all specified requirements. HCC's receiving site will give specific instructions during the APQP process or other formal communication.

The Supplier should have installed a system capable of retrieving and submitting the requested Certificate of Conformity within 24 hours after HCC's request.

5.5 Problem Solving Methods

Suppliers shall hold available trained (preferably certified) personnel with the ability to quickly and permanently resolve product and process issues using data driven problem resolution tools and techniques.

Problem resolution must be conducted using a defined, structured process like the 8-Discipline process, Six Sigma DMAIC (Define, Measure, Analyse, Improve, and Control) or any other adequate process that includes verification of the root cause and validation of corrective action effectiveness.

Data driven techniques should also be used during the process design, verification and validation phases of the APQP process in order to prevent problems with new or changing products and processes. These data driven tools and techniques include but are not limited to: Failure Mode and Effects Analysis (FMEA), Measurement System Analysis (MSA), Statistical Process Control (SPC), Design of Experiments (DOE), Ishikawa diagram and Taguchi Methods.

Product design responsible suppliers must use reliability methods during the product design, verification and validation phases of the APQP process in order to assure the ro-

bustness and durability of their product design for the intended application or as specified by HCC.

5.6 Non-Conforming Components / Corrective Actions

For any case of non-conforming components the Supplier shall have a complaint handling flow process and procedures in place that allows the Supplier to take all necessary corrective and preventive actions for all rejects or non-conforming components received by HCC and respond within the time frame defined in the table below.

The Supplier shall use the systematic 8D analysis method with risk assessment. For each Supplier incident an 8D-Report shall be submitted to HCC. The defined containment action shall stay in place until the effectiveness of the implemented corrective action has been verified successfully. The respective reaction time period as defined in the table below ("Time table") shall begin with the initial notification to the Supplier by HCC that a problem exists.
By the Supplier's report HCC shall be enabled to determine the instance level as defined below for the incident. The instance level shall be set to "priority" in case of potential HCC or Customer line stoppage, reliability risk, components in safety applications and Customer returns. Upon request the Supplier shall provide top management support in the 8D team as part of an adequate escalation process.

Time Table:

8D disciplines	**standard**	**priority**
D2: Problem description		
D3: Implement containment actions	released within 24h	released within 24h
D4: Define root cause(s)	released within 3 days	released within 24h
D5: Choose permanent corrective action		
D6: Implementation of permanent corrective action	released within 14 days	released within 7days
D7: Action(s) to prevent recurrence		
D8: Prevention of repetition	per agreed plan	per agreed plan

The Supplier shall provide HCC with a report immediately upon receipt of the defective component.

Irrespective of the instance level, the Supplier shall take all necessary short-term actions (e.g. screening) at its plants, at the sub-supplier's plants, – upon request by HCC - also at HCC's plants, and if required at the Customer's plants. These actions shall guarantee continuous delivery of defect free components.

Any arrangements with third party for the purpose of containment action and maintaining full production capacity of HCC's production lines shall be the responsibility of the Supplier. HCC in general shall not be obliged to provide any personnel or space for the required Supplier's containment actions.

The Supplier shall keep HCC informed on a regular basis about the progress in the failure analysis process.

In case the analysis of the Supplier concludes that a claimed non-conformity is not in the Supplier's responsibility or no failure found (NFF), the affected components shall be sent back to the respective HCC contact person immediately, along with all analysis results.

Otherwise the components will be considered as being at Supplier's fault after two (2) weeks from the initial notification date.

5.7 Changes to Approved Products and Processes (PCN / ECN / PTN)

Suppliers and sub-suppliers are not allowed to make any unauthorized changes to a product (e.g. material, component, sub-assembly) or the process used to produce a product that has been previously PPAP approved by HCC. This includes changes to Process Control Plans.

The Product Change Notification/Engineering Change Notification (PCN/ECN) process shall apply to all production and prototype components.

The Supplier shall submit the notifications following the preconditions:
- PCN's/ECN's - 6 months prior to the planned product/process change, with samples availability and qualification report done.
- All affected part numbers must be identified within the PCN/ECN.
- Only 1 PCN/ECN within 2 years for affected components might be accepted by HCC.

- PTN for customized components: A lifetime supply (series and aftermarket requirements) must be guaranteed. Consequently no product discontinuation will be accepted.
- PTN for standard components: A lifetime supply should be guaranteed for the series production.

In case of unavoidable product discontinuation:

- The Supplier must send a Product Termination Notification (PTN) to HCC, in writing minimum 12 months prior to such discontinuation.
- All affected part numbers of HCC shall be identified with the PTN.
- The Supplier shall specify alternative components / solutions for replacement.
- If the PTN leads to a last time forecast/buy, HCC provides the Supplier with forecasts information.
- The products must be stored at the Supplier's premises and remain ownership of the Supplier until they are shipped according to the delivery schedules and / or purchase order of HCC.
- The Supplier is responsible for the correct storage, handling and quality of the products. Furthermore quantities terminated for HCC are exclusively to be delivered to HCC's location, which forecasted the products.

PCN / ECN / PTN for electronic and electro mechanic components must be submitted to the global e-mail address:

HCC-supplier-product-info@hirschmann-car.com

PCN/ECN for mechanical products must be submitted to all locations of HCC the products are delivered to. Lack of written response from HCC does not constitute acceptance of the change/termination.

HCC's supplier quality department responsible for supplied components manages the supplier and component approval whereas the location specific manufacturing and application approval is performed by HCC's locations.

The Supplier has to receive acceptance and release notifications from all HCC's locations, affected by the PCN. Deliveries of changed components and / or termination of delivery must not start prior to a written approval of all respective HCC's locations.

The Supplier is obligated to label the first shipment including the change with proper identification, mutually agreed upon between the Supplier and the receiving HCC's location.

5.8 Identification and Traceability

The Suppliers shall maintain an appropriate traceability system. The aim of traceability shall be to minimize the impact and consequences of quality concerns.

Suppliers are obligated to utilize and ship material on a “first in” – “first out” basis.

Forward Trace

Forward Trace shall be the provision of any information required to identify suspect components already delivered in order to minimize the quantity of non-conforming components - as early as possible.

Traceability Requirements for electronic components

- For packaged parts a maximum of 2 trace codes per packing unit (reel, tray, tube, etc) shall be required.
- For components without sufficient marking possibilities on the product itself (bare die, small package size, etc.) the traceability data shall be placed on the packaging. One lot per packing unit shall be required with one exception: In order to facilitate deliveries of full packing units, it shall be allowed to use the subsequent lot to complete the packing units (e.g. reel).

Backward Trace

Backward Trace shall be the provision of any information required to identify suspect source material and origin at the Supplier.

The Supplier’s traceability system shall ensure that its final components and subcomponents utilized in the product can be traced back to the manufacturing date, shift, equipment, tool number and the respective inspection/conformity results. Based on internal risk assessment lot sizes shall be established minimizing the internal risk as well as the external risk.

Marking and identification

Labelling must be done according to HCC's receiving site requirements. At a minimum, the Supplier Identification, Part Number, Engineering Level, Quantity and Batch/Lot Number must be clearly legible in both human readable and bar coded form on the part-packaging label. The 2-D Code (PDF417) for package label description shall be used if not otherwise agreed with the receiving location.

5.9 Incoming Inspection

The Supplier quarantees “Zero defect“ deliveries. Acceptance requires an explicit declaration of HCC.

HCC will only perform an incoming goods inspection with regard to discrepancies in identity and quantity of components that can be identified externally as to its accordance with the delivery documents; furthermore the shipment shall be inspected for externally visible damages caused by transportation. HCC shall not be obliged to carry out a more detailed incoming inspection. HCC will report defects of this kind immediately in writing. In addition, HCC will report defects as soon as they are determined in the normal course of business. The Supplier hereby waives the objection of delayed reporting of a defect.

6 SUPPORTING DOCUMENTS AND STANDARDS

The provisions of the following documents are mandatory for suppliers of HCC:

- Quality System Requirements ISO/TS 16949
- Quality System Assessment (QSA)
- Production Part Approval Process (PPAP)
- Advanced Product Quality Planning and Control Plan (APQP)

- Potential Failure Modes and Effects Analysis (FMEA)
- Measurement Systems Analysis (MSA)
- Fundamental Statistical Process Control (SPC)
- Tooling & Equipment Assessment (QSA-TE)

Annex 1:
PPM Action limits to each category

Material Field	PPM-Value HCC-Vorgabe	ppm-Wert Lieferant
Passive components		
Capactor	5	
Resistor	1	
Buttons, switches.	10	
Relay	10	
Encoder	10	
Bulbs	5	
Potentiometer	10	
Others	5	
Aktive components		
Diode	1	
Transistors	5	
IC	10	
ASIC	50	
Driver, Triacs	10	
Eprom, Memory	30	
voltage regulator	10	
Quartz	20	
Resonator	10	
µC, µP	30	
LCD	50	
LED, Opto	2	
Programmed OTP´s u. Flash-Memories	100	
Others	50	
Connection technology		
Cable	10	
Connector	10	
Base	1	
Printed Circuit boards	50	
Others	50	
Miscellaneous		
Mechanical modules and submod-ules/electronic modules and PCBA's	100 ppm in the first year 50 ppm after the first year	
CD/DVD drives	100	
Displays/LCD	100	
Data technology		
Motherboards	100	
Power supply	50	
Mechanical components		
Plastic parts	30	
Plastic parts painted	50	
Plastic parts with spezial surface	100	
Plastic part painted and lasered	200	
Plating	0 ppm, certificate	
Seals / rubbers.	30	
Stamped parts	10	
Turned parts, stamped-bended parts, springs	30	
Nuts, rivets, screws	5	
Coatings, chemicals, granules/ressin	0 ppm, certificate	
Aluminum, zinc, magnesium die castings	100	
Aluminum, zinc, magnesium die castings with paint or technical. surface	200	
Sheets, scales, printing	50	
Specific parts of the ramp up phase (Sample phase, pre-series, series)	Acceptance of HCC by countersigning on request of the Supplier. Otherwise above levels are valid.	

HCC expect that based on the KVP/CIP principle, the ppm values will be reduced on a yearly base by minimum 10%. Should be your commodity not included in the list, please contact HCC supplier quality department for target setting.