VOLKSWAGEN AG

Quality Capability Suppliers Assessment Guidelines

QM-system requirements
Potential analysis
Self-audit (Self-assessment)
Process audit, Product audit
Mandatory Documentation (D/TLD-parts)
Technical Revision Suppliers
Problem analysis

5th completely revised edition Volkswagen AG, January 2005
4.1 Additions/changes to edition 4 (online in B2B platform)
   (All changes compared to the edition 4 are marked in blue.)

This brochure will only be available in the current version electronically through the B2B Platform under www.vwgroupsupply.com.

The requirements in this brochure are customer specific requirements and are to be complied with in addition to the QM system requirements (VDA6.1 or ISO/TS 16949). The supplier has the obligation to keep constantly informed about the latest status through the B2B Platform and always comply with the latest valid requirements.

This brochure is available in German as well as English and will also be available by February 2005 in Spanish, Portuguese, Czechoslovakian and Chinese.

Proprietor Volkswagen AG

This brochure is copyright protected. All rights especially the rights of duplication and distribution as well as translation are reserved.

Issued by: Volkswagen AG
Group Quality Audit Suppliers
P. O. Box 1467/0
D - 38436 Wolfsburg
Germany
Phone: 49-5361-973185, Fax: 97223
**Quality Management Agreement Purchase Parts**

**Elements:**

- **Formel Q**
  - Overall Agreement as a part of the contract

- **Formel Q-Konkret**
  - Quality Management Agreement Between Volkswagen-Group and their suppliers

**Formel-Q Capability** *
- Quality Capability Suppliers Assessment Guideline (Self audit, Doc., TRL, PA)

**Formel-Q New Parts - Integral**
- Qualification Program for New Parts Suppliers
  - 2-Day Production Run “QPN”

**Supplier Evaluation**
- For continuous improvement
- Quality, Service, Price, Logistics, Environment and Innovation

**Result**
- A
- B
- C
- The best chosen from these

**Yearly Award**
- Volkswagen Group Award

* In total 25 suppliers from the following areas:
  - Quality (5 suppliers)
  - Development competence (5 suppliers)
  - Entrepreneurial performance (9 suppliers)
  - Logistics (5 suppliers)
  - Environment (1 supplier)

* This brochure describes this component

**Figure 1:** Quality Management Agreement Purchase Parts
**Foreword**

The 5th revised edition of this brochure considers the new quality strategy that was agreed upon between the manufacturers and the suppliers through the VDA. According to which suppliers in the automotive industry must have a quality management system according to ISO/TS 16949 or VDA 6.1 as well as the realization of the VOLKSWAGEN EXCELLENCE strategy.

With our new Quality strategy VOLKSWAGEN EXCELLENCE the process orientation in the Volkswagen Group and also for our suppliers should have renewed force.

VOLKSWAGEN EXCELLENCE has three directions:

- Fully Developed Product (Concept Quality)
- Robust Processes (Repeatability)
- Excellent Customer support (Service Quality)

Therefore the following is required:

- Process orientation
- Q-methods competence

**Group – Quality Assurance - Purchasing**

![Figure 2: VW Excellence](image)

The goal of this strategy is customer satisfaction, that is to say customer enthusiasm. The suppliers are one of the most important factors to reach our goal, which requires adequate procedures at our suppliers. This is the reason the Volkswagen Excellence Strategy expects our suppliers to set a goal of “Business Excellence”. We are fulfilling those requirements by demanding a stronger weight on the self-assessment (self-assessment see chapter 4) for our suppliers. Only through self-qualification and regular self-initiated self-assessment can the continuous improvement requirement for example Kaizen be realized.
Foreword

This document should demonstrate the Quality requirements to the supplier and enable them through self-assessment of the QM system, process and product to react to the international common and specific Volkswagen Group requirements and effectively uphold them.

Through VOLKSWAGEN EXCELLENCE, the Process and Product audits continue to be the priorities of Volkswagen and our suppliers. They are thus also the priority of this brochure. The requirements were based on available experience and have been more accurately enhanced.

In order to obtain additional safeguards regarding conformity we created an additional instrument “Technical Review Suppliers” (section 10). Technical review visits are to be done at our suppliers after a short notice and serve essentially to assure compliance with legal requirements (for example D/TLD, EU VO) and our significant customer requirements.

With regard to the QM system requirements, we refer to ISO/TS 16949 or VDA Document 6 Part 1 as a harmonized quality management standard. These QM system reference works are no longer part of this brochure.

The brochure “Formel Q Capability” is a supplement to “Formel Q Konkret” with process descriptions for the assessment of the quality capability of suppliers to Volkswagen. It is binding for our suppliers of production materials for all the brands of the group as well as for the associated companies worldwide.

The content of this booklet refers further to the applicable VDA guidelines and booklets. Special requirements of Volkswagen in terms of the processes and products as well as the requirements that resulted from continuous improvement programs (CIP) and the cooperation with suppliers with regard to new projects are described here.

For the Volkswagen Group, the brochure is a regulatory framework with compulsory requirements for suppliers and forms the basis for auditing the manufacturing plants of the suppliers.

To improve communication and optimize the business relation team concept with our suppliers we created the Volkswagen B2B forum. Under www.vwgroupsupply.com you can find additional multilingual information and are requested as our supplier to keep your supplier information up to date.

Wolfsburg, December 2004

F. J. Garcia Sanz  F. Schling
Board member Group Purchasing  Head of Corporate Quality Assurance
VOLKSWAGEN AG  VOLKSWAGEN AG
Content Formel Q Capability Revision 5

Content
Cover page
QM-agreement purchased parts (Graphic Formel Q House)
Forward (Garcia Sanz / Schling)

1 Introduction
1.1 Purpose
1.2 Requirements for quality capability assessments
1.3 Responsibilities
1.4 System structure
1.5 Rating results and follow-up activities

2 Quality management system audit according to VDA
2.1 General
2.2 Recognition of QM system audit results/certificates

3 Potential analysis
3.1 General
3.2 Auditing and evaluation process
3.3 Auditing and evaluation product development process
3.4 Total evaluation
3.5 Realization (flow charts)

4 Self-assessment Suppliers
4.1 General
4.2 Realization (flow charts)
4.3 Escalation steps

5 Product audit
5.1 General
5.2 Execution and actions
5.3 Fault classification decisions, actions
5.4 Realization (flow charts)
Content Formel Q Capability Revision 5

6 Process audit
6.1 General
6.2 Process audit in the product creation process Part A
6.2.1 CAD requirements
6.3 Process audit of series production Part B
6.4 Scoring
6.4.1 Individual scoring of process element questions
6.4.2 Total scoring
6.4.2.1 Total scoring product creation process Part A
6.4.2.2 Total scoring series production Part B
6.5 Realization (Flow charts)

7 Overall evaluation of the quality capability, rating
7.1 General
7.2 Scoring scale
7.3 Downgrading criteria
7.4 Upgrading criteria

8 Quality verification audit for (D/TLD-parts)
8.1 General
8.2 Audit procedure
8.3 Definition of product groups/part selection
8.4 Evaluation of individual questions/audit results
8.5 Audit report/improvement program
8.6 Identification codes for technical documents
8.7 Realization (Flow charts)

9 Problem Analysis (PA)
9.1 General
9.2 Realization/flow
9.3 Escalation principles

10 Technical Review Suppliers (TRL)
10.1 General
10.2 Reason for TRL realization
10.3 Realization (flow chart)
10.4 Escalation principle

11 Documentation/Verification of the Formel Q Capability
List of Requirements

12 List of requirements for potential analysis

13 List of requirements for the process audit

Part A Product creation process
(Design–element requirements for QM system, Formel Q New Part Integral, Qualification of personnel foreign language knowledge added)

1 Product Development
1.1 Planning
1.2 Realization

2 Process Development
2.1 Planning
2.2 Realization

Part B Series production

1 Sub-contractors/Purchased Material

2 Production
2.1 Personnel/qualifications
2.2 Machinery/equipment
2.3 Transportation/parts handling/storage/packaging
2.4 Failure analysis, corrective actions, continuous improvement

3 Customer care/customer satisfaction
3.1 ISO/TS 16949 requirements added
3.6 D/TLD explicitly noted
3.7 B2B requirement added

14 List of requirements for mandatory documentation (D/TLD Parts)

15 Instructions Technical Review Suppliers (TRL)
15.1 Questionnaire
15.2 Test record
15.3 Visit announcement
15.4 Realization
15.5 Report
Content Formel Q Capability Revision 5

Attachments
A1: Volkswagen Group forms
A2: Other documents/relevant information
A3: Illustrations
A4: Abbreviation
A5: Explanations/definitions / symbols flow diagrams
A6: Literature
1. Introduction

1.1 Purpose

The evaluation system for the quality capability of Volkswagen Group suppliers is based on a quality standard for the automotive industry that was developed by the VDA/ DGQ expert group.

According to this quality standard, the QM system according to ISO/TS 16949 and VDA 6.1 is the basis for suppliers of production material, and the fulfillment of the requirements must be proven to the Volkswagen Group by a certificate (third party).

In addition to the quality management system certificate, a process/product audit that is comparable to VDA 6.3/6.5 is used for special product groups to assess the quality capability of suppliers. Apart from the basic requirements of a QM system, it also considers the special product-related requirements of Volkswagen purchased parts, the production process, and special technical inspection requirements.

The process audit facilitates the evaluation and the choosing of suppliers (bidders) prior to awarding of business as well as the qualification of series suppliers. This planning is made to ensure that the processes and the process sequences are free of defects when series production starts and continues during series production. The as-delivered quality and the function of the products must comply with the customer requirements. Adherence to important customer relevant product characteristics and all customer requirements at the sub-contractors is of particular significance.

A systematic and regular failure and process analysis must be conducted by the supplier, which leads to the introduction of continuous improvement programs. This has fundamentally product and cost optimization as a goal due to the improved processes and procedures.

Compliance with the basic requirements according to ISO/TS 16949 or VDA 6.1 Part 1 must be verified through certification (third party). However, the process/procedure steps for Volkswagen Group products and adherence to important product characteristics are audited exclusively by the auditing teams of the Volkswagen Group or Volkswagen's associated companies.

The purpose for self-assessment by the suppliers is to assure compliance with the Volkswagen Group specific product and process requirements (SA = Supplier self-assessment see section 4) per Formel-Q requirements.

The evaluation result provides information on the quality capability of the supplier for individual product groups. It points out to what extent a QM system, corresponding to the standards, has been established and effectively converted into practice and how much the process/procedure steps for the Volkswagen Group products comply with the specific requirements and specifications of VW.
1. Introduction

The quality capability evaluation is a component of the supplier assessment. The effectiveness of the QM performance and of the processes is measurable by evaluating the quality performance of delivered products or services (see Figure 1).

A positive supplier evaluation, which comes from quality capability and performance, is a pre-requisite for receiving a purchase order.

Fig. 3: Supplier evaluation (QF/QL)

1.2 Requirement for Quality Capability Assessments

The quality capability of selected suppliers, before the placing of an order, must always be proven before a purchase order for a new part (forward sourcing) or for a series part (global sourcing) is placed.

The proof can be submitted by self-certification and audit of the suppliers plus supplementary audits to be carried out by the responsible departments in the VW Group, using the potential analyses or the process audit.

A new proof of the quality capability is also required if a new product according to the product group catalog should be delivered for which no audit of the quality capability has been performed.

If a current series supplier is commissioned with new or altered products, it must be confirmed that the existing evaluation is sufficient or whether, where necessary, previously irrelevant QM elements, or individual requirements or new technologies which were not previously evaluated, are now more significant and require supplementary evaluation. This is clarified in the course of the Qualification Program New Parts (QP N), held between the VW project supervisors and the quality audit supplier group.
1. Introduction

Therefore, for example, a supplier without previous product development activity must be audited in the relevant quality management element of design control if such services are to be provided. A supplementary audit is necessary for parts requiring special verification (D/TLD parts) if supplied for the first time.

VW Group Purchasing must ensure that the intended supplier has already been informed of all criteria and requirements and has access to the B2B Supplier system (www.vwgroupsupply.com) prior to the preparation of a quotation so that these can be introduced into the calculation, as necessary. If the supplier has access to the B2B supplier platform they must enter the DUNS-Nr. in the supplier data bank and maintain this information. If the offer is positively accepted by the VW Group Purchasing department (CSC Team), the assessment of the quality capability and additional elements should be initiated.

Before the order is placed and the initial sample is ordered, there must be a quality capability rating of A or B. The determined improvement action is to be implemented by the supplier before series production (see Fig. 2) so that all the requirements are complied with by the start of series production. The goal is to attain a quality capability rating of “A”. As long as this is not obtained the supplier must continue with improvement programs and the effectiveness confirmed through self-assessment.

(Note: See brochure “Qualification Program New Parts-integral”).

The rating of the quality capability is based on product and process results through a VW Group auditor. The evaluation reflects the conditions of the supplier at a given time and place and how they meet the VW Group requirements.

Changes to processes and equipment as well as changes of sub-contractors must be communicated to the Volkswagen Group receiving plant and the Volkswagen auditing department. A new assessment of the quality capability and, if necessary, a new initial sample order can subsequently be effected (see also VDA Document 2 “Ensuring the quality of deliveries”).
1. Introduction

Figure 4.1: Flow diagram purchase parts inquiry to production approval

Comments/Explanations: (*): Due to temporary bottle necks, critical projects or unacceptable reaction time of supplier VW Group conducts Product and Process Audits, although Self-Audit did not achieve Grade "A".
1. Introduction

![Flow diagram purchase parts inquiry to production approval](image)

**Figure 4.2:** Flow diagram purchase parts inquiry to production approval
1. Introduction

1.3 Responsibilities

The on-site quality capability assessment of applicants and suppliers of the Volkswagen Group and its subsidiaries is carried out by experienced auditors. Other experts from development, production departments, quality control for purchased parts of the plants, purchasing and/or other departments of the VW group participate in potential analyses and audits for special product and process requirements. However, coordination is always controlled by **Group Quality Assurance Purchasing** (K-QS-4) or the auditing departments of the individual brands / affiliated companies.

If the Quality Management System has already been audited/certified according to **ISO/TS 16949** or **VDA volume 6 part 1** by third parties or by VDA authorized certification organizations, then a case by case decision will be made as to whether the result can wholly or in part be recognized and considered or whether a renewed re-audit is necessary.

All follow up activities necessary in this context such as pursuit of the improvement program at the suppliers are the responsibility of the Supplier Quality Audit Group from “Concern Quality Assurance Purchasing” (K-QS-4) or the audit groups at the different Volkswagen brands and divisions.

1.4 System Structure

The total assessment of the quality capability per product group is divided into the following audit types for a clear separation of principal requirements and procedures in the Quality Management System according to **ISO/TS 16949** / **VDA 6 Part 1** and the process / product specific requirements for product development, manufacture and delivery of Volkswagen products:

- Quality management system audit
- Potential analysis or process audit
- Product audit
- Self-assessment

(for interfaces and key points see Fig. 5 and 6)
1. Introduction

Questions and a list of requirements derived from the quality management element and the process requirements (see Fig. 6) are used in the quality audit. The individual requirements are coordinated with the supplier during the audit, important product requirements are additionally considered during the product audit.

Quality Management System Audit, Potential Analysis, Process Audit, Product Audit and Self-assessment are integrated into the total evaluation of the quality capability for Volkswagen suppliers. In the case of existing or applicable certificates/Quality Management System Audit results prepared by third parties, the total assessment is based on the list of requirements (potential analysis/process audit) used and the specifications as well as the defined rating criteria. The assessment is based on a points system for the individual questions/requirements and a calculation formula for the accumulation of the individual level of achievements of quality management elements and process.

Where certificates/ extraneous audit results which can be considered are already present, a rating according to these results can be given. If a supplementary process or product audit becomes necessary, the rating comes from this audit and all requirements audited therein including supplementary audit questions from the Quality Management System (see section 7).

Rating of quality capability occurs according to product groups (for example electronic control modules, trim parts, steering gear) with additional production/process tasks if necessary, such as for example, mechanical treatment/stamping, drawing, bending/heat treatment/injection molding (plastic)/assembly/painting.
1. Introduction

Quality management in the automotive industry
Certification and auditing

Figure 5: Interfaces and priorities of different audits
1. Introduction

Quality Capability

Quality System Audit

For special concern product groups

Certification: ISO/TS 16949 or VDA 6.1

Potential Analysis

Process Audit

Self-assessment Supplier & Volkswagen Group

Fulfillment of important product characteristics

Product Audit

18

Experience references
Compliance with important characteristics

Part compliance
QM-system
JIT concepts
Internal audits

Product

Product planning
Responsibilities
Specified time frames
Development capacities
Series release
Customer contacts

Quality

Q-analysis
Test devices
CIP

Purchased parts

Supplier qualification
Product release
Part storage

Production

Process installations
Process capabilities
Process specifications/quality
Material flow

Customer Care - Customer satisfaction

Product audit
Failure analysis
Corrective action
Customer contacts

Product Creation Process

Only Before SOP

Product Development

(Planning and Implementation)

Process Development

(planing and Implementation)

VDA 6.3 part A

Full scale production

Purchased material / Purchased parts

Assessment of Suppliers
Product, Process Release
Delivery, Identification, Storage of Products
Non-conformity Analysis, Continuous Improvement

Production (each production stage)

Use of Personnel and Qualification
Operational Equipment/Facility
Transportation/Parts handling
Storage/Packaging
Non-conformity Analysis
Continual Improvement

Customer Care

Customer Satisfaction (Service)

Satisfaction Customer
Requirements
Reliability/endurance tests
Non-conformity Analysis

VDA 6.3 part B

Figure 6: QM System process elements and product quality for the assessment of quality capability

18
1. Introduction

1.5 Rating results and follow up activities

Improvement measures are normally agreed and scheduled with the supplier on the basis of the audit result. It is expected that the supplier introduces the required measures and that the improvement program is implemented immediately.

The supplier is obligated to indicate the agreed improvement measures and their implementation to the VW Group auditor, who then decides whether a renewed audit of the suppliers’ production area is required. A supplier can only be released for series deliveries if the shortcomings that were pointed out in the respective improvement program have been eliminated according to the deadlines, the start of production (SOP), and if the relevant requirements are complied with. After completion of the improvement program the realization should be proven through a self-assessment by the supplier.

A new process and product audit through the VW Group, a Problem Analysis or a Technical Revision Supplier is required for unacceptable quality performance of the supplier. With the supply of new products/product groups through the series supplier, fundamentally a new audit is required (see the following flow chart).
1. Introduction

<table>
<thead>
<tr>
<th>Grade</th>
<th>Responsible</th>
<th>Support</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Auditor VW Group</td>
<td>Supplier QS / Mgmt.</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Auditor VW Group</td>
<td>Supplier QS</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Supplier Mgmt.</td>
<td>Supplier QS</td>
<td>QSK</td>
</tr>
<tr>
<td></td>
<td>Supplier</td>
<td>Auditor VW Group</td>
<td></td>
</tr>
</tbody>
</table>

### Process Flow - Assessment Results and Follow up Activities

- **Assessment Results Quality Capability**
  - **Grade A**
  - **Grade B**
  - **Grade C**

- **Define Weak Points / Improvement Actions**
- **Specify immediate actions (**)**
- **Define Improvement Actions, Responsibilities and Completion Dates**
- **Validation of Improvement Actions**
- **Conduct Self Qualification**
- **Conduct Self-Audit Inform VW Group**
- **Re-Assessment when significant Process Changes, new Product Groups / Projects, inadequate Quality Performance**
- **Conduct a new Process and Product Audit**

### Comments/Explanations:
- (*) = critical Projects/Reaction time/Supplier unacceptable (means VW Group conducts a Product and Process Audit, even though “A” Grade could not be achieved during Self-Audit)
- (**) = with production suppliers only/applicants with “C” Grade will not be approved

Figure 7: Flow diagram rating results and follow up activities
2. Quality management system audit according to VDA

2.1 General

The quality management system requirements of the VW Group are based on agreements between vehicle manufacturers and suppliers, to which a QM system according to ISO/TS 16949 or VDA 6 Part 1 must be proven effective. The requirements for the QM elements correspond to DIN EN ISO 9001:2000 with specific additional requirements for the automotive industry and refer to the basic definitions and requirements for the quality management system and the respective practical application. Structural and functional aspects are analyzed; the interaction of interface functions and interface tasks is considered in a decisive scope. The proof must be shown through a third party certificate. In exceptions the QM system should be partially or completely evaluated through the auditors of the Volkswagen Group. Maintaining the QM system must remain valid and is the supplier’s responsibility.

In the audit, the presence and effectiveness of installed quality management systems at the individual production site are determined and compared with the requirements of the products produced at the supplier.

The knowledge and the action of the management and the employees responsible for the individual quality management elements are systematically assessed and, if necessary, improvement actions are agreed upon.

The assessment basis for the quality management system audit are the quality management manual of the supplier, quality management instructions and procedure guidelines as well as guidelines for company management, order documents and customer and legal requirements. The effective application of the individual QM system requirements must be proven.

The remarks and explanations for this can and must be provided by the person responsible for the relevant quality management element. This makes understanding and practical application transparent.
2. Quality management system audit according to VDA

In case of missing ISO/TS 16949 or VDA6.1 certification the supplier has to commit to binding certification timing. In this case the following VDA6.1 quality system elements have to be audited additionally during the process audit:

- 05 Financial considerations regarding QM systems
- 06 Product safety
- Z1 Corporate strategy
- 08 Design control (product development), if applicable
- 09 Process planning (process development)

If serious shortcomings are determined during the process audit, additional VDA 6.1 QM system elements are included in the evaluation where necessary or a complete QM system audit will be performed.

This refers to the respectively valid document VDA 6 Part 1 with regard to individual requirements, explanations and references to the QM system as well as the evaluation of individual questions of the QM elements and the total evaluation of the QM system.

The suppliers are obligated to submit all the results regarding certifications/auditing, even those that were executed as self-audits, to Volkswagen on request. These documents must be accompanied by improvement programs that have already been compiled and initiated.

The qualification proof can be requested before the order is placed through the Supplier Information form and also a self-assessment of the supplier, (see attachment). The supplier information and the self-assessment of the supplier provides the Volkswagen Group with the option to specify special additional requirements and to restrict their own audit to the most essential issues.

(The allocation and over-lapping of the individual audit types are depicted in Figure 3)
2. Quality management system audit according to VDA

2.2 Recognition of QM system audit results/certificates

An audit of the quality management system and the process/procedure steps is very time-consuming and ties up a host of personnel and represents a high cost factor to both the audited company and the company performing the audit.

The Volkswagen Group recognizes equally certification according to ISO/TS 16949 or VDA 6.1.

Accredited certification authorities that are approved by the VDA or IATF must execute the certification and all the audit certificates must be available so that the certificates can be recognized (including deviation reports).

**Second party audits are if necessary recognized for individual elements according to VDA 6.1 – however, not as an overall evaluation.**

The recognition refers to the QM elements according to VDA 6.1 that must be audited in addition to the process audit if no certification exists (see Point 2.1). However, not more than 2 years may have passed since the execution of the last audit.

In the event of any serious deviations in the process audit and the supplementary auditing of the QM system elements referred to, the certificate will not be recognized for QM system elements with less than 75% compliance. Volkswagen will request the supplier to arrange for a subsequent auditing by the certifying authority. In addition the VW Group reserves the right through VDA or IATF to verify the certificate. A certification review can also be requested due to customer dissatisfaction (major quality problems).
3. Potential Analysis

3.1 General

The quality capability and the development know-how of the applicant must be assessed when preparing a decision regarding the placement of an order with an unknown supplier, in particular when ordering technically sophisticated products. Technically sophisticated products are products with special requirements in terms of the manufacturing technology, high quality demands, special technological requirements compared to the competitors and special requirements in terms of the development performance of the supplier.

Such determination of the quality capability with the aim to prepare for the purchasing order decision is carried out within the framework of a Potential analysis, involving experts of different business areas of the Volkswagen group to determine the technical and organizational facilities on the production site of the supplier at short notice and with a minimum time expenditure.

The auditing team is formed by experts from the Quality Audit Supplier Group and the development audit department, as well as depending on the individual case, other experts from the relevant departments, such as Purchasing, Production, Logistics and QA Purchased Parts from the receiving plant.

The potential analysis serves for evaluating the development and process potential of the applicant, referring to the parts and the processes as indicated and specified by the purchasing department. The experience of the supplier with regard to similar product and the potential in the core processes of product realization are assessed.

The potential analysis requirement list is used for systematic and reproducible analysis. The questions / requirements that are not applicable at the time when the audit is carried out are not included in the evaluation. The product development potential can also be evaluated by a supplementary requirement list of the development “component-specific evaluation of development partners” in this same context.

3.2 Auditing and evaluation process

The “process” potential analysis is the determination and the evaluation of the potential with regard to the offered parts, the suitability of processes and process sequences as well as the capability to fulfill the customer requirements / expectations.
3. Potential analysis

The following evaluation elements exist:

- Compliance with important component requirements (important characteristics)
- Experience / references
- Process development / project planning potential
- Q methods / Q techniques used
- Pre-material / purchased parts (sub-contractor qualification)
- Customer care / customer satisfaction (service)
- Production (all process stages) with process specifications, process installations, quality control activity / test technology, material flow / logistics.

The individual questions and evaluation elements are evaluated according to the following evaluation scale:

<table>
<thead>
<tr>
<th>Number of points</th>
<th>Evaluation of the compliance with individual requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Requirements <strong>fully</strong> complied with</td>
</tr>
<tr>
<td>8</td>
<td><strong>Majority</strong> of requirements complied with; minor deviations</td>
</tr>
<tr>
<td>6</td>
<td><strong>Some</strong> of the requirements complied with; serious deviations</td>
</tr>
<tr>
<td>4</td>
<td>Requirements <strong>unsatisfactorily complied with</strong>, serious deviations</td>
</tr>
<tr>
<td>0</td>
<td>Requirements <strong>not</strong> met</td>
</tr>
</tbody>
</table>

* **Majority** means in this regard that more than approx. ¾ of all the requirements have effectively been proved and that no special risk exists.
3. Potential analysis

The degree of fulfillment of every individual element (E_E) and the degree of fulfillment of the process (E_P) are calculated as follows:

\[
E_E [\%] = \frac{\text{Total of all the points achieved for evaluated requirements}}{\text{Total of all possible points for element}} \times 100 [\%]
\]

\[
E_P [\%] = \frac{\text{Total of the degrees of fulfilment of all the evaluated elements}}{\text{Number of the evaluated elements}} [\%]
\]

3.3 Auditing and evaluating the product development process

The Potential analysis “Product development process” is a part specific evaluation of development partners. The basic structure of the related questionnaire is the responsibility of the Volkswagen AG (Group) Development Management.

Evaluation sections:
- Norms and requirements
- Construction and simulation systems
- Construction resources
- Innovation in technology and product
- Research, laboratory and dimensional analysis
- Prototype build
- Project competence/communication
- Methods of product development
3. Potential analysis

The development questionnaire form is used for the evaluation of each individual element.

The degree of fulfillment $E_D$ is calculated as follows:

\[
E_D [%] = \frac{\text{Sum of all achieved points}}{\text{Sum of all possible points (260)}} \times 100 [%]
\]

3.4 Total evaluation

The rating is individually determined for $E_P$ and $E_D$. The overall evaluation according to rating A, B or C is, according to the “obstacle” principle, always the lower individual rating.

Rating scale:

<table>
<thead>
<tr>
<th>Rating</th>
<th>Degr. of fulfillment $E_P$ [%]</th>
<th>Degr. of fulfillment $E_D$ [%]</th>
<th>Determination regarding the purchase order decision</th>
<th>Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>at least 92</td>
<td>at least 90</td>
<td>Can be used</td>
<td>Without any series individual weaknesses</td>
</tr>
<tr>
<td>B</td>
<td>82 – 91</td>
<td>75 – 89</td>
<td>Can be used with conditions</td>
<td>Improvement/investment program can be implemented by the start of the development/SOP</td>
</tr>
<tr>
<td>C</td>
<td>0 – 81</td>
<td>0 – 74</td>
<td>Cannot be used</td>
<td>Implementation of an improvement/investment program by the start of the development/SOP cannot be foreseen/cannot be fulfilled</td>
</tr>
</tbody>
</table>

Downgrading

- An evaluated company must be downgraded to rating C if the improvement/investment program is not foreseeable/not fulfilled for individual criteria by the start of the development/SOP. This is noted in the audit report.
- Other reasons for a downgrade are described in Section 7 Overall evaluation of the quality capability, rating.
3. Potential analysis

An improvement program that might be necessary is coordinated with the audited company on the date of the audit. The auditing team specifies the deadlines for the implementation and deadlines for the follow-up activities. The Supplier Quality Audit Group department monitors the improvement program and the initiation for a subsequent audit, where necessary.

A process/product audit according to Sections 5,6 must always be carried out by the “Start of Production“ (SOP), an A-rating should be the goal. Even in the event of a rating “Not qualified” (C Rating), the audited company is requested to correct the determined weaknesses and to report the implementation of improvement action to the evaluation team so that the improvements can be considered for future purchasing order decisions.
3. Potential Analysis

3.5 Process flow (Flow diagram)

**Process Flow - Potential Analysis (PN)**

- **Start**
  - Decision to conduct a Potential Analysis
  - Visit Preparation / Registration

- **Conduct PN (Potential-Analysis)**
  - 3.2 Assessment Q
  - 3.3 Assessment TE

- **Results presented locally at Supplier**

- **Result of Assessment**
  - "A" or "B" (qualified)
  - "C" (not qualified)

- **Decision for Procurement**
  - yes

- **Conduct Process and Product Audit**

- **End**

**Figure 8: Flow diagram potential analysis**
4. Self-Assessment Suppliers (SA)

4.1 General

The result of the self-assessment has the purpose to prove the quality capability of the supplier. With the increased importance of self-assessment especially in regard to the concept of Automotive Excellence (Self-assessment see VDA 18) we have given it greater importance. The self-assessment should be understood as a tool of constant improvement. The principles of “agreements of goals”, “measurement capability”, and “continuous improvement” are the foundation for self-assessment. Each supplier is responsible for the success of this program. Each supplier must constantly control their effort and results.

We also are committed to the concept of Automotive Excellence through the VOLKSWAGEN EXCELLENCE model. With our new quality strategy more effort is directed toward process orientation in the Group and with our suppliers.

Through the increased importance of the supplier self-assessment we are achieving a contribution to the realization of our VOLKSWAGEN EXCELLENCE strategy. The focal points remain Process and Product audits. It is important that the supplier’s processes and products comply with all normal international and Volkswagen Group requirements and are optimized in a timely manner and effectively maintained.

The self-qualification of the supplier is part of a “continuous improvement process” and should be used to obtain the grade “A”. A self-grading with an “A” will be verified through an evaluation with Volkswagen Group Process and Product audits (for more details see diagram).

4.2 Realization

Fundamentally the audit should be performed by (qualified) internal auditors of the location.

A self-assessment is included in the quote process or after a Volkswagen Group Process audit that requires improvements to be conducted to verify the improvement action. The Self-assessment per Formel Q capability must not be confused with the process audits planned in general. It is oriented towards customer specific requirements and has the purpose to verify, using internal personnel, the agreed improvements. With this self-assessment the realization of the Volkswagen Group Requirements and effectiveness in a timely manner are verified.
4. Self-Assessment Suppliers (SA)

Only after the supplier has proven the effectiveness of their improvements through an “A” grading via a self-assessment will Volkswagen conduct a Volkswagen Process and Product audit verification.

Volkswagen reserves the right for critical projects and unacceptable reaction time of the supplier to conduct process and product audits at any time.

In the following cases a charge back for the Volkswagen Group Audit costs are foreseen:

- If due to an unacceptable reaction time a Volkswagen Group Process audit is required.
- If due to supply or quality problems by the supplier in our receiving factories a Volkswagen Group audit is required.
- If an unrealistic self-assessment (“A” grade) from the supplier cannot be confirmed by a Volkswagen Group audit.
- If the “A” grade is not achieved in an acceptable time and requires additional Volkswagen Group Process audits.

(For more details regarding the realization see the diagram on the last page of this section.)

4.3 Escalation steps

After repeated charge backs and no compliance to VW requirements regarding improvement programs, timeline and or not obtaining the required (“A” grade) the following escalation steps must be used:

1. Escalation Step

2. Escalation Step
   Quality discussion with the responsible technical department including management.

3. Escalation Step
   Quality discussion at the Group level including top management, if needed reduction to grade “C”.
4. Self-assessment Suppliers (SA)

Figure 9: Flow diagram self-assessment of the quality capability of the supplier
5. Product audit

5.1 General

Process variations and low process capabilities tend to have a direct effect on product quality and, consequently, the compliance with customer requirements. In a product audit, it is possible to determine deviations from the customer requirements and to directly draw conclusions with regard to the influencing processes. Taking the detected deviations into account, it is possible to investigate and analyze the priorities in terms of the problem processes and to implement corrective action. The processes can be investigated, analyzed in key areas and continuous improvements achieved.

The supplier is always obliged to carry out product and process audits on their own on a regular basis. Volkswagen also carries out product audits for certain priorities before the process audits at the supplier to evaluate important product characteristics from the point of view of the customer and to identify critical processes.

The task of the product audit is to inspect products that are ready for shipment in terms of their compliance with the specified customer-relevant characteristics, to draw conclusions with regard to the parts / as-delivered quality, to trace deviations back to the defects in the process that cause them and to initiate corrective action, where necessary.

See VDA Volume 6 Part 5 for details.

5.2 Execution and actions

The Volkswagen Group product audit is performed before the Process audit and refers to a few important characteristics that must be defined in consultation with the supplier. The characteristics are selected in a risk-oriented manner according to possible fault category A and or B (see table). It is not possible to include long-term tests in the audit. The latest results that the supplier can provide regarding these products can be used in this regard, if necessary. The most important characteristics can refer to, for example:

- Characteristics that deviate from the customer requirements
- (complaints from the past)
- Dimensions (initial measurement, function, assembly)
- Material
- Function
- Visual appearance
- Product identification
5. Product audit

Prior to the shipping of completed products with identified problems category A or B, immediate improvement action (production stop / sorting with 100% testing and immediate communication to the factory receiving locations by the supplier) is required to eliminate the possibility that faulty products are supplied. Required corrective actions are to be implemented immediately.

In case of detected faults of category C the required actions are to be agreed upon immediately with the Quality department of the factory receiving locations.

For the execution of the audit, a production batch that was recently produced or parts thereof must be available so that the quality of the current process can be retraced. The parts for the inspection are taken directly from the warehouse or before shipment from the original packaging for the customer.

The quality of the container, cleanliness and packaging are also evaluated, however are not included in the product audit evaluation, but are referred back to the process audit and integrated in the respective evaluation.

The sample size for parts in the product audit depends on the product complexity and previous experience. At least 5 to 10 parts of one part number should usually be taken. The target and the actual values are recorded and evaluated. (See Appendix for form).

Should any deviations from customer requirements be determined, immediate action, such as sorting of the stocks, quarantine of parts, required special action at the customer, is initiated; such action must be realized on short notice.

In the parts inspection, the quality and functional capability of the test, inspection and measurement equipment is also evaluated and considered in the process audit. Corrective action must be agreed upon if any deviations from customer requirements are determined. Quality ratings (QKZ) are not calculated, they are subject to the internal product audits of the supplier (see VDA 6.5).

If any faults are found, these are considered for determining the overall result for the process audit. A rating can be derived from this (see Section 7 Overall evaluation of the quality capability, rating).
## 5. Product audit

### 5.3 Fault classification, decisions, actions

<table>
<thead>
<tr>
<th>Fault category</th>
<th>Fault description / effect</th>
<th>Immediate action</th>
<th>Follow-up action</th>
</tr>
</thead>
</table>
| A              | Fault will certainly result in customer complaints.  
- Safety risk, violation of legal regulations, no start conditions  
- Product cannot be sold/function not fulfilled  
- Extreme surface complaints | Quarantine / sorting out of existing parts  
- Information to purchasing plants and risk assessment  
- Corrective action in the manufacturing/inspection process, full inspection, if necessary  
- Intensified test action on the process and the finished product  
- Full inspection before delivery, if necessary | Continue analysing process/test activities  
- Develop and implement corrective action  
- Prove process capability and zero defects  
- Check effectiveness of initiated action  
- Arrange for change of specifications, if necessary |
| B              | Annoyance of the customer or complaints can be expected.  
- Foreseeable failure  
- Reduced serviceability | |
| C              | Complaints from demanding customers can be expected.  
- Deviations that do not have an influence on the use or the operation  
- Serviceability not reduced | Information to purchasing plants to coordinate action |
5. Product audit

5.4 Process flow (Flow diagram)

Start

Preparation for Product Audit
view drawings / specifications problem information QSK

R: Auditor VW Group
S: QSK

Sample check in supplier
dispatch stores.

Locally at Supplier

Review of suppliers internal
Product Audit results.

R: Auditor VW Group
S: Supplier QS

Review latest drawings /
specifications and approval of
documents at supplier

R: Auditor VW Group
S: Supplier QS, Engineering

Define test characteristics
(incl. manufacturer logo, visual
checks)

R: Auditor VW Group
S: Supplier QS

Conduct
Product Audit

R: QS Supplier
S: Auditor VW Group

Write
Product Audit Report

R: Auditor VW Group
I: Supplier QS & QSK

Free of errors ?

yes

End

no

1

Input

Output

VW Group Data Storage
i.e. ISQAD / KVS

Review supplier work instructions for sampling

Product Audit Reports

ISIR, drawings, Specifications
(TLs/PVs/...)

Specifications
Forms
Product Audit

Forms
Product Audit

Product Audit Report

Drawings
Specifications
Product Audit Report

Figure 10.1: Flow diagram product audit
5. Product audit

Figure 10.2: Flow diagram product audit
6. Process audit

6.1 General

In addition to the quality management system audit, which as a rule is carried out by certification organizations authorized by the VDA or IATF, a process audit is carried out for production parts with special requirements of the Volkswagen group; the audit considers these requirements of the Volkswagen Group and includes the verification of secure processes and process sequences. If necessary, the series production of applicants will be audited using comparable competitor parts and the currently used processes. The requirements of this audit are based on VDA 6.3 with Volkswagen Group specific additions.

The Process Audit provides the assessment/measurement of the process and procedure quality of the product and process development steps, suppliers/purchased material (purchased parts) of the individual process steps in the parts manufacture as well as the compliance with all customer requirements right up to complete customer satisfaction. (See section 13 List of requirements for the process audit)

Processes, for which this audit is particularly suited as an investigation method, can be identified by the following characteristics:
- New products
- New processes/new factories
- Numerous processing steps
- Numerous variables
- High quantities or volumes
- Numerous single purpose equipment
- Enforced long term planning and usage
- Technological special features compared to the competition

In the Process Audit the coordination and adherence of the process and procedure quality is evaluated in conjunction with job, process, and procedure instructions, ingredients, technical product/process specifications, customer and legal requirements.

Process audits are particularly necessary for:
- Projects, new awards, transfer, new production locations
- New products, respectively new product groups
- Special customer and legal requirements
- Differing process and procedure steps
- Several functions with split responsibility or
- Arising quality problems/non compliance with the customer and legal requirements
6. Process audit

At series suppliers the product audit is conducted prior to a process audit (see section 5). If a deviation on the product is detected all processes that could be the cause are to be analyzed with more intensity.

The audit is oriented towards the requirements of specially designated parts and the processes belonging to them. The Process Audit is divided into 2 main sections:

A  Process Audit of the Product Creation Process with assessment of all tasks for product and process development after order placement of the customer and
B  Process Audit of Series Production with assessment of all process and process sequences in the ongoing production.

A particular key point is the conversion of customer and legal requirements into practice and the presentation of continuous improvements.

The key points of the audit are the timely planning and qualification of products and processes of the Volkswagen parts as well as continuous improvement (CIP) in all process and procedure steps. The qualifications of the personnel and their responsibility in the process are of particular importance.

Individual questions with similar content to the Quality System Audit according to VDA 6.1 and ISO/TS 16949 are consciously asked in order to be able to assess the effectiveness of the QM system on the product / process. The results provide information about the actual application of the QM System in the Product Creation Process of a product, or a product group, in series production and customer care in order to achieve the greatest customer satisfaction.

Insufficient compliance can raise questions about an existing assessment of the Quality Management System and if necessary effect a new Quality Management System Audit.

In the Process Audit all previously known problems of the product and process (quality performance) are included and the current process capability of important/decisive characteristics assessed (see also product audit section 5).

For a systematic and reproducible analysis the list of requirements for the process audit (see section 13) is used. The questions not applying at the time of the audit are deleted and not entered into the assessment. Those questions are to be indicated as “NA” not applicable.
6. Process audit

In exceptional cases experts from the VW organization may participate in the audit in agreement with the Supplier Quality Audit Group.

The determined result applies to the total corresponding product group (according to the product group list, see Appendix).

6.2 Process Audit in Product Creation Process Part A

The Process Audit can be carried out very early or shortly after nomination, even if no series production has occurred, or if new factories are planned (green field).

Here the audit is based on requirements and their compliance within the individual project dates in the product development process and contains the strategic orientation to supporting processes in the planning and implementation phases.

The product development process is always an individual audit element compared to the process development and is therefore generally calculated and awarded with an individual level of achievement.

Process development is also assessed as an individual element and designated as a separate second element until the start of series production. Existing/comparable processes for series production are included in the audit. Failures must be traced back to the process planning for the new product and must be already improved at that stage.
6. Process audit

Product and process development is important for later customer satisfaction in series production. Therefore the individual requirements must be checked at suitable intervals for adherence/ deviations and if necessary newly specified in the project.

In all the phases of product development, risk analyses must be carried out and target agreements must be defined to fulfill all the customer expectations with suitable action and continuous improvement (see also VDA Volume 4 Part 3 and Formel Q Integral - QPN).

6.3 Process Audit of Series Production Part B

Process audits performed during the series production require that the product generation process (product and process development) is completed. They consider to a large degree customer satisfaction and supporting processes.

The implementation of defined actions after finalization of the product creation process is a prerequisite for and a subject of the audit.

Auditing in the series production without process development can be performed at start of production (SOP) or at any time during the entire manufacturing process. The result of this process audit can be used individually or in conjunction with a quality management system audit or certification as a measure of the total assessment of the quality capability and rating of the supplier.
6. Process audit

For process observations and process improvements it is necessary to operate production non-conformity analysis in-house and to introduce continuous improvements derived from these. Suppliers with their own processes must also be included in the total process chain observation and perform their contribution to continuous improvement.

A further process to be considered is product observation after delivery and customer care. Rapid recognition of problems and decrease of customer satisfaction must trigger immediate process improvement activities.

6.4 Evaluation Process audit results

6.4.1 Individual Assessment of the Questions and Process Elements

Each question is rated with regard to the respective requirements and their fulfillment for securing the process. This rating may be 0, 4, 6, 8, or 10 points with the evidence of the degree of fulfillment being the standard for the scoring:

<table>
<thead>
<tr>
<th>Points</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>requirements <strong>fully</strong> met</td>
</tr>
<tr>
<td>8</td>
<td>requirements <strong>mainly</strong>* met; minor deviations present</td>
</tr>
<tr>
<td>6</td>
<td>requirements <strong>partially</strong> met; major deviations present</td>
</tr>
<tr>
<td>4</td>
<td>requirements <strong>unacceptably</strong> met, serious deviations present</td>
</tr>
<tr>
<td>0</td>
<td>requirements <strong>not</strong> met</td>
</tr>
</tbody>
</table>

* “**mainly**” means that more than ¾ of all requirements are proven effective and that no special risk exists.
6. Process audit

The degree of fulfillment $E_E$ of an evaluation element is calculated as follows:

$$E_E \left[ \% \right] = \frac{\text{Total of all the points achieved for evaluated requirements}}{\text{Total of all possible points for every evaluated element}} \times 100 \left[ \% \right]$$

6.4.2 Overall evaluation of the process audit

6.4.2.1 Overall evaluation of the product creation process Part A

The evaluation of a product group depends on the respective situation after the decision regarding a purchase order has been made (see Figure 6). Thus, for instance, the product development process can only be evaluated as long as no manufacturing processes have been installed, i.e. all the planning activities are evaluated.

If series production comprises comparable processes / products, these are also evaluated according to the requirement list Part B. Deficiencies that were determined must be considered in the planning processes of the supplier, must be proven, and concrete corrective action must be allocated to these.

The rating is only executed after Part A has been evaluated. The degree of fulfillment in the product creation process $E_D$ must be determined from the degree of fulfillment of product development (design) $E_{DE}$ and the process development $E_{PE}$.

$$E_D \left[ \% \right] = \frac{E_{DE} + E_{PE}}{\text{Number of evaluated elements}} \left[ \% \right]$$

6.4.2.2 Total evaluation of series production Part B

With / after the start of series production (SOP), once the production creation process has been completed, the evaluation is exclusively executed according to Part B, and the rating is carried out according to these requirements. All the required action from the planning / realization phase must have been implemented by this time.
6. Process audit

Owing to the different process steps for the respective product groups in the production element, the process steps must be summarized for the respective product group (E\textsubscript{PG}). The elements E\textsubscript{Z} and E\textsubscript{K} are independently evaluated.

It is necessary to audit individual process steps and to summarize these according to product group to ensure a smooth weighting of all the elements. Different degrees of fulfillment might result for the individual product groups because of the respectively selected process steps within the production element.

The average value E\textsubscript{PG} of every product group is calculated as follows:

\[
E_{\text{PG}} \text{ [ \%]} = \frac{E_1 + \ldots + E_n}{\text{Number of evaluated process steps}} \text{ [ \%]}
\]

In this context, E\textsubscript{1} is the first and E\textsubscript{n} the last process step in the production, referring to the respectively indicated product group.

The total evaluation of the degree of fulfillment E\textsubscript{p} for the process audit is calculated as follows:

\[
E_{\text{p}} \text{ [ \%]} = \frac{E_{\text{Z}} + E_{\text{PG}} + E_{\text{K}}}{\text{Number of evaluated elements}} \text{ [ \%]}
\]

In addition to this process evaluation, the sub-elements with system reference in the production element can also be represented separately and evaluated. These are:

EU1: Personnel/qualification of the staff  
EU2: Operating resources/installations  
EU3: Transport/part handling/storage/packaging  
EU4: Failure analyses/corrective actions/continuous improvement
6. Process audit

As the evaluation is carried out over various process steps, the interfaces to the QM system are recorded and deficiencies are indicated. In the event of serious deficiencies repeated auditing for applicable QM elements according to VDA 6.1 might be required.

6.5 Audit report self-assessment of the supplier

The total evaluation is included in the audit report. The report should include a list of noted deviations (improvement program) that are basic for the supplier’s corrective action including timing and responsibility.

In case of an “A” grade, the supplier should use this improvement program for further enhancement under their own responsibility. In case of a “B” (“C”) grade the completed improvement program must be presented to the Volkswagen Group auditor who will accept it or demand additional improvements. After realization of the improvement program (normally within 12 weeks) the supplier is requested to conduct another Process audit per Formel Q Capability (see section 4 Self-assessment).
6. Process audit

Evaluation contents and evaluation at different phases

<table>
<thead>
<tr>
<th>Time of the audit</th>
<th>Evaluation contents</th>
<th>Evaluation Degree of fulfillment [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>When the order is placed before SOP, no comparable series processes exist (green field)</td>
<td>Product creation process Part A ¹ □ Product development (if relevant) □ Process development</td>
<td>Individual elements Total: E₁, E₂, E₃, E₄</td>
</tr>
<tr>
<td></td>
<td></td>
<td>E₅, to Eₙ, Eₖ</td>
</tr>
<tr>
<td>When the order is placed before SOP, comparable series processes exist (also series analysis on competitor parts, if necessary)</td>
<td>Product creation process Part A ¹ □ Product development (if relevant) □ Process development Series production Part B ² □ Pre-material suppliers □ Production (all the existing/required process steps) □ Customer care, customer satisfaction</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>E₅, to Eₙ, Eₖ</td>
</tr>
<tr>
<td>With start of series (SOP) or running series production</td>
<td>Series production Part B ² □ Pre-material suppliers □ Production (all the existing/required process steps) □ Customer care, customer satisfaction</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>E₅, to Eₙ, Eₖ</td>
</tr>
</tbody>
</table>

Notes:
1. All the tasks must be distributed on the time axis. Checkpoints/milestones must be listed (see Formel Q Integral – QPN / VDA Volume 4 Part 3). The auditor must adjust the percentage fulfillment with the supplier; the project plan must correspond to the Volkswagen Groups specifications. It must be realistically possible to comply with all the requirements by SOP.
2. The auditing of existing parts manufacture may refer to comparable products for other customers or to Volkswagen Group series parts, identified defects must be dealt with in the planning activities (Part A). E₅ is only determined for Volkswagen Group series parts and a special rating is derived from it.
3. The audit refers exclusively to applied processes of the supplier’s products; processes at sub-contractors can be integrated.
6. Process audit  

6.6 Process Flow (Flow diagram)

**Process Flow - Process Audit (VA)**

- **Start**
  - Audit Preparation including collecting and evaluating supplier specific data, IP/ Audit Reports (Self-Audit (SL))

- **Notification for Audit**
  - Kick off Meeting
  - If required Q-Problem review and tour the facility

- **Conduct Product Audit**
  - Conduct Process Audit (following the process chain)

- **Any deviations noted?**
  - Yes → **Immediate actions required?** → Yes → Define/ initiate immediate actions
  - Yes → Implementation of immediate actions
  - No → Demonstration of weak points
  - If necessary proposal of corrective actions

- **Registration**
  - VW Group Data Storage i.e., ISQAD / KVS

- **Problem Report**
  - Deviation Report
  - Audit Agenda

- **Formel Q**
  - Capability, Sec. 5 Specifications
  - Capability, last IP or SL, Specifications

- **Product Audit Result, Problem Report**
  - Improvement Program, 8D-Report
  - Improvement Program, 8D-Report
  - Improvement Program, 8D-Report

---

**Figure 11.1 Flow diagram process audit**

---

47
6. Process audit

**Process Flow - Process Audit (VA)**

1. Write Audit Report (incl. cover sheet, Improvement Program, Product Audit, general information)
2. Closing Meeting (explaining improvement potential)
3. Define appropriate improvement actions (incl. date, responsibility, status)
4. Audit Result "A"?
   - yes
   - no (Grade "B" or "C")
5. Send Improvement Program
6. Corrective Action Program
7. Actions appropriate?
   - yes
   - no
   - Define additional appropriate actions if required
8. Implementation of Actions (Realization IP)
9. Actions effective?
   - yes
   - no
   - Self-Qualification Supplier

**Input**

- Formel Q Capability/ Forms Process / Audit Report
- Process Audit Report
- Improvement Program

**Output**

- Process Audit Report/ Improvement Program
- Formel Q Capability Process Audit Report
- Improvement Program
- Improvement Program / 8D Report
- Self Audit Report / SL IP
- Formel Q Capability Chapter 4

**End of local Supplier Visit**

R: Responsible
S: Support
I: Information

- R: Auditor VW Group
- S: Supplier QS/Mgmt.
- R: Mgmt. Supplier
- S: QS / technical depart. Supplier
- R: Auditor VW Group
- I: Supplier QS/Mgmt.
- R: Mgmt. Supplier
- S: QS Supplier
- I: Auditor VW Group
- R: QS Supplier
- V: Auditor VW Konzern
- I: QS Lieferant
- V: QS Lieferant
- V: QS Lieferant
- V: QS Lieferant
- I: Auditor VW Konzern / QSK
- V: Mgmt. Lieferant
- S: QS Lieferant

**Figure 11.2 Flow diagram process audit**
7. Overall evaluation of the quality capability, rating

7.1 General
The overall evaluation for every product group is composed of:

- QM system evaluation
  The QM system evaluation per VDA6.1 or ISO/TS 16949 is the basis for an acceptable Volkswagen Group supplier of production material. The proof of these requirements through a 3rd party certificate must be supplied to the Volkswagen Group. In exceptions a Volkswagen Group auditor will perform the QM system audit. In this case the QM system grade ($E_{QMS}$) through the VDA 6.1 complete will be used or the appropriate sample elements.

- Process evaluation:
  Degree of fulfillment $E_d$ for product/process development, and/or degree of fulfillment $E_p$ for the series process

- Product audit with representation of the fault frequencies for every fault category for series suppliers

The total grading of the quality capability is exclusively based on the VW Group’s evaluation results. Normally the audit result is obtained from the process audit $E_D$ and or $E_P$ \((E_{process} = (E_D+E_P)/2)\). When there is a simultaneous realization of a QM system evaluation the QM system grading result ($E_{QMS}$) is noted in the Volkswagen Group audit report. The total grading result (A, B or C grade) is done per the obstacle steps. The lowest result ($E_{process}$ or $E_{QMS}$) is used.

Partial QM system evaluation
In case that during the audit doubts come up regarding the effectiveness of a certified QM system, the Volkswagen Group auditor can immediately review those QM system elements. In addition other QM system elements could be audited if the QM system requirements prove that the VW requirements are insufficiently met (for example only certification to QS9000 or ISO 9000).

Individual elements regarding the QM system, which are included in the audit according to the selection of the auditor (in the above cases), are not considered for the calculation of the degree of fulfillment with regard to the process audit ($E_{process}$). The evaluated QM system elements are, however, considered for the rating according to A, B or C within the framework of the downgrading criteria (see 7.3 downgrading criteria).
7. Overall evaluation of the quality capability, rating

7.2 Rating scale

An audited company can be rated in the following manner:

<table>
<thead>
<tr>
<th>Rating</th>
<th>Degree of fulfillment ( E_{GES}/E_D/E_P ) (%)</th>
<th>Designation of the rating</th>
<th>Definitions/requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Greater than or equal to 92</td>
<td>Quality capable</td>
<td>Customer requirements in terms of development/series production are basically complied with No serious individual weaknesses Corrective action/CIP by supplier</td>
</tr>
<tr>
<td>B</td>
<td>82-91</td>
<td>Quality capable with conditions</td>
<td>Deadlines for improvement program have been set and can be implemented within an acceptable period of time Corrective action Subsequent audit</td>
</tr>
<tr>
<td>C</td>
<td>0-81</td>
<td>Not quality capable</td>
<td>No parts can be quoted Determine immediate action No new parts released Implementation of improvement/investment program Subsequent audit, if necessary</td>
</tr>
</tbody>
</table>

Remark: The results are noted without the decimal. The results are rounded up or down mathematically.

Figure 12: Grading Scale

The “obstacle” principle is applied to the overall evaluation of the rating according to A, B or C, i.e. the lowest degree of fulfillment from \( E_{ges} \), \( E_D \), and/or \( E_{process} \) determines the rating.
7. Overall evaluation of the quality capability, rating

7.3 Downgrading criteria:

Established failures/shortcomings in the product audit, process audit or Quality Management system audit as well as not fulfilling of the previously agreed upon improvement program can lead to downgrading.

Reasons for downgrading from A to B despite more than 92% degree of fulfillment ($E_d \text{ and or } E_{\text{process}} \text{ and if applicable } E_{\text{QMS}} \geq 92\%$) follows when:

- No certification of the QM system according to VDA 6.1 or ISO/TS 16949.
- One or more evaluation elements of the QM system were evaluated with a degree of fulfillment of less than 75%.
- One or more questions of the system audit/process audit/verification D/TLD parts were evaluated with 0 points/no.
- Faults of fault category A or B were determined in the product audit.

Reasons for downgrading to C despite more than 82% degree of fulfillment ($E_d \text{ and or } E_{\text{process}} \text{ and if applicable } E_{\text{QMS}} \geq 82\%$)

- Decisive quality targets of Volkswagen are not complied with.
- Target deadlines in project are not tenable or improvement/investment program cannot be implemented before the SOP.

The auditor of the Volkswagen Group must always clearly state reasons for the downgrading to B or C and list them in the audit report.

Reasons for downgrading to C, despite more than 82% ($E_d \text{ and or } E_{\text{process}} \text{ and if applicable } E_{\text{QMS}} \geq 82\%$)

- Supplier refuses to implement an improvement program or does not implement it after they were requested to do so.
- Self-assessment < 82%
- Not reaching an acceptable goal of the Volkswagen Group Audit in a timely manner (A grade)

The supplier will be informed in writing of the downgrading by the responsible Volkswagen Group audit department.
7. Overall evaluation of the quality capability, rating

7.4 Upgrading Criteria

Fundamentally, upgrading through a Volkswagen Group audit can only be achieved when the supplier obtains the above required criteria at their manufacturing location. An upgrade from C to B can only be achieved with an audit result from the Volkswagen Group with a “stable B” which means higher than or equal to 85% (E_{process} and if applicable E_{QMS} >= 85%)
8. Quality Verification Audit for D/TLD Parts

8.1 General

Car manufacturers are subject to certain stipulations as a result of legislation, which must be fulfilled as a minimum requirement for all series vehicles. This means that all suppliers have to maintain verification documentation, which, despite the product liability (liability irrespective of responsibility), should protect the suppliers and the car manufacturer against any subsequent damage, for instance a prohibition to sell their products and penalties for non-performance. (See product liability laws of the countries where the VW Group vehicles are distributed.)

In order to adequately counteract the manufacturer's liability, the Volkswagen Group has gone beyond the normal legislation, and has implemented a procedure where parts, which are important to the safety of human beings, also require special verification.

In addition to the general requirements of the quality management system, suppliers must maintain verification for individual D/TLD parts. This data must be kept for a minimum of 15 years. This also includes the following documents that are identified with "D" or "TLD". These can include drawings, tables, production release documentation, technical delivery specifications, test specifications, sample reports and other quality records, which can be demanded as proof and which can relieve the party of liability.

Verification documentation also includes information regarding planning-type activities, the selection and qualification of personnel, suitability of test equipment, as well as process-capability investigations and correspondence.

If there is a claim and/or if Volkswagen so requests, the supplier must be in a position to prove that he has done everything in his responsibility, as the supplying company, to eliminate any faults and defects in their particular product.

Volkswagen checks this against defined product features of the product groups to be supplied, and expects that suppliers apply the appropriate procedure to every D/TLD part which is supplied.

If shortcomings are identified during the audit (see Requirements catalog in section 14), it is assumed that the supplier will, on his own accord, implement the required corrective actions as quickly as possible, and will specify the date that they will respond to the audit report. After the supplier has presented their improvement program, a decision will be made as to whether a new audit is required.
8. Quality Verification Audit for D/TLD Parts

If no re-audit is required because the improvement program was positively evaluated or no improvement program was required the supplier must conduct at least once per year an internal audit (TLD self-assessment) per section 8.2 to 8.5 to demonstrate the effectiveness and if applicable implement improvement actions. The results of the audit must be archived for at least 15 years. The supplier must always be able to prove that he applies the necessary measures to secure and maintain quality.

For the verification, all of the specifications according to VDA Volumes 1 and 6 Part 1 as well as ISO/TS 16949 and the customer specific requirements (Formel Q) must be taken into account.

8.2 Audit Procedure

When auditing, the “List of requirements for verification audits (D/TLD parts)” (refer to Section 14) must be completely executed and completed; non-relevant questions must be removed (for an evaluation of the individual questions, refer to Point 8.4).

8.3 Definition of Product Group / Part Selection

For D/TLD parts, the VW Group defines the product group during the first audit. As a rule, it involves the product group where the supplier received a positive quality capability evaluation by the Volkswagen Group (also refer to the product group list in the Attachment).

It must be ensured, that all parts (D/TLD) which must be verified and all of the specified features that require verification, are considered as important parts/features. For the system audit, each feature has to be documented. During the system audit, sample parts for which the compliance with the defined requirements must be proven by process and product audits should be selected for every characteristic that requires verification proof of the D/TLD parts that are to be delivered. These reference parts are selected from a list of “parts that have to be verified for the VW Group”. The suppliers must always keep this list up-to-date. The extent of the random check during the product audit should be defined according to the part and the features to be checked; i.e. as an example, a part is selected from the supply list, where all the characteristics that have to be verified are taken into account.
8. Quality Verification Audit for D/TLD Parts

8.4 Evaluation of Individual Questions/ Audit Results

Every applicable question is evaluated in terms of a consistent compliance, even when the process is secured.

<table>
<thead>
<tr>
<th>Situation</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements <strong>completely</strong> fulfilled</td>
<td>yes</td>
</tr>
<tr>
<td>More than about $\frac{3}{4}$ of the specified points have been effectively proven and there is no specific risk</td>
<td>mainly</td>
</tr>
<tr>
<td>Requirements are <strong>not</strong> or <strong>not adequately</strong> fulfilled</td>
<td>no</td>
</tr>
</tbody>
</table>

*Figure 13: Grading scale questions D/TLD audit*

All of the applicable questions must be complied with; the supplier must resolve all of the deviations by implementing an improvement program. A system release for the D/TLD verification is possible if all of the requirements have essentially been fulfilled, and there is no special risk.

If deviations are identified, which directly influence the product quality (for example missing test unit), immediate measures are defined (for example external test/check), which guarantees that the product quality is immediately secured.

If the supplier is not in a position to fulfill the requirements, the receiving factory/plant is informed. This supplier is then prohibited from supplying parts - a procedure which is agreed upon with the responsible purchasing department of the Volkswagen Group.
8. Quality Verification Audit for D/TLD Parts

8.5 Audit Report / Improvement Program

The report includes the following documents and verification:

1. Cover sheet "Quality audit, verification for D/TLD parts", specifies the part selection, the D/TLD characteristics, results from the product audit and the fulfillment of characteristics for which verification is compulsory. Defined immediate actions are required in the event that customer requirements are not complied with. The deadlines for an improvement program that might be required are set (completion date of the entire action to be implemented).

2. List of requirements, verification audit for D/TLD parts with evaluation

3. Improvement program

An improvement program must be defined if deviations are identified to the questions in the list of requirements (the weaknesses/ measures must be specified, together with the date that they will be resolved and the responsible personnel).

The identified weaknesses must be corrected by the agreed to date.

4. Overview(s) of the results of the product audit with the test results, including all the D/TLD characteristics which need to be identified.

The systematic and consequent steps for the demonstrated characteristics are through the D/TLD self-assessment by the supplier and by Volkswagen through process audits checked and evaluated.

8.6 Identification Codes for Technical Documentation

The Volkswagen Group has two identification codes that have the same degree of importance (the old “D” and the new “TLD”).
8. Quality Verification Audit for D/TLD Parts

D-Identification Code:

The D identification code is used in technical documentation, such as drawings, TL-VW specifications, etc., if dimensions, textual information or section numbers are associated with legislation or internal assembly specifications. A D is entered in the basic text field (drawing header, “D-code” or “Safety Doc.” field) to identify the compulsory verification. The dimensions or other D features in the associated documentation have a bar above them, with small vertical demarcation lines as shown in the following (___)

TLD-Identification Code:

A D is not entered in the basic text field (drawing header) in the “Safety Doc.” field; instead, TLD is entered. The number of the TLD Sheet is then entered in the “documentation” field. This includes the features that have to be documented and information regarding any legislation. There is no bar located above features or regulations.

Only the main delivery specifications (TL) are listed in the TLD Sheets. If a reference is made in this TL to another TL, compulsory verification is also applicable to this TL.

8.7 Identification of the technical documents

(Flow diagram D/TLD audit see next page)
8. Quality Verification Audit for D/TLD Parts

### Process Flow - D/TLD Audit

- **Start**
- **Nomination Decision**
  - Production Supplier
  - R: Responsible  
  - I: Information
- **Do Specifications contain D/TLD Requirements?**
  - R: Supplier QS/Eng.
  - S: Supplier Mgmt.
  - I: Supplier QS/Eng.
  - yes:
    - Supplier checks D/TLD characteristics and ensures conformance with D/TLD Requirements
  - no:
    - End
- **Conduct D/TLD Audit**
  - R: Auditor VW Group
  - S: Supplier Mgmt.
- **Write D/TLD Audit Report and sign**
  - R: Auditor VW Group
  - S: Supplier Mgmt.
- **Any deviations?**
  - yes:
    - Define appropriate improvement actions and send Improvement Program to VW Group
  - no:
    - Correct Improvement Program
- **Improve Program OK?**
  - yes:
    - End
  - no:
    - Improvements Program

**Order**
- Formel Q- Capability/ Specifications
- Specifications/ D/TLD Implementation Program
- Formel Q Capability, Section 8 & 14 Specifications
- D/TLD-Audit Report/ Improvement Program (IP)
- Improvement Program/ TLD Self-Audit Report
- Improvement Program
- Improvement Program

**Locally at Supplier**

---

**Figure 14.1 Flow diagram D/TLD audit**
8. Quality Verification Audit for D/TLD Parts

Process Flow - D/TLD Audit

1. Implement Improvement Program and report

3. Were serious deviations in the D/TLD Audit?
   
   yes

2. Approval of TLD Self-Audit

3. Implementation Review of D/TLD Requirements
   Question 3.6 of Process Audit or Technical Revision of Supplier (TRL)

   Are serious deviations present?
   
   yes

   no

Supplier to regularly conduct TLD Self Audits (min. 1/year)

Figure 14.2 Flow diagram D/TLD audit
9. Problem Analysis (PA)

9.1 General

The problem analysis is used for product problems of series parts (after SOP). It is part specific. Fundamentally the complaint process is done through QS Purchased Parts of the receiving VW Group factory. In special cases (for example overlapping complaints/problems that question the system of the supplier) the VW Group Technical Supplier Quality Department through QS Purchased Parts of the receiving VW Group factory or other areas of the Volkswagen Group can be assigned to perform this work.

The problem analysis has the purpose of improving the purchased parts quality of products under series conditions and the elimination of actual quality problems. The PA is based on findings from fault analysis, how undetected problems got through the process and how corrective actions and improvements are established at the supplier, sub-contractor, and or business unit.

The realization of the problem analysis is performed when required together with experts from the QS department of the receiving Volkswagen Group factory and other areas. The problem analysis should be coordinated with QS Purchased Parts of the receiving Volkswagen Group factory and other areas.

The fundamental product responsibility including evaluation of the results of the problem analysis and in regard to the total quality achievement of the supplier is the responsibility of the corresponding QS Purchased parts department at the receiving Volkswagen Group location.

9.2 Realization / Flow

The realization of the problem analysis results in fast, effective, and a permanent remedy of quality problems that are the reason for non-compliance of the delivered product from the supplier.

The analysis is solution oriented and parts specific. During a supplier visit a product audit of the problem part is the starting point for the problem analysis.

Every process that could be a cause for the problem should be intensively analyzed. The potential improvements from the analysis are to be listed in a specific detailed improvement program (immediate/short and medium term measures) including a time frame and the name of the person responsible.
9. Problem Analysis (PA)

Figure 15. Flow diagram problem analysis
9. Problem Analysis (PA)

9.3 Escalation Principle

The processing of the corrective action for the detected shortcomings as listed in the improvement program must meet the timing and deadlines as noted. If there are recognizable problems regarding the implementation of the improvement measures an escalation principle is planned. This includes the following escalation measures:

- Quality discussion with the responsible technical department and involvement of management (Supplier/VW Group)
- Involvement of the corresponding Purchasing department
- Quality discussion at Volkswagen Group level with the involvement of TOP management (Supplier/VW Group), if applicable downgrading to “C"
- If required transfer of manufacturing

If the supplier is not in a position to resolve the quality problems (non-conformity of delivered products) in a short time and with effective and permanent corrective action, the Volkswagen Group reserves the right to downgrade the supplier to a “C” grade (Suspension from new parts release see section 7).

The Volkswagen Group reserves the right to charge the supplier for any costs associated. The responsible department of the Volkswagen Group decides in each case when the costs for the problem analysis are charged to the supplier (“Regressierung”).
10. Technical Review Suppliers (TRL)

10.1 General

Through the technical review the Volkswagen Group pursues the following goals:
- Assurance of conformity of parts and components through review/testing of the safeguard activities.
- Reliability/Series and audit tests at supplier

The TRL is a review to assure that parts and components comply with legal and Volkswagen requirements at all times. Additionally the quality organization of the supplier is checked. Volkswagen can at any time and at all suppliers conduct a review on short notice.

The technical review is performed through qualified members of the Quality Assurance – Purchased Parts department, that is Volkswagen Group auditors.

The current evaluation (audit) activities are not replaced by the TRL but are enhanced.

10.2 Reasons for the TRL

The realization of the TRL is justified if the following deviations are noted with regard to the supplier:
1. Obligation to inform VW in case a detected specification deviation (reliability/long term testing) is not done.
2. Manufacturing location change is not reported, engineering/first sample approval is not requested.
3. Product characteristics during series testing are not verified sufficiently.
4. Poor quality compliance through an unstable internal/external process.
5. Unsafe process in the related sub-contractor process chain.
6. Preventative actions without direct contact or reason.

Comment:
The announcement of the technical review is done via fax the day before the visit.
10. Technical Review Suppliers

10.3 Process Flow (Flow diagram)

Start

Decision to conduct TRL
(similar to catalogue of criterias)

Information to Supplier
on short notice
(no advanced notification)

Conduct
Technical Revision
Supplier

Improvements
required?

yes

Define Improvement Actions

no

no

Escalation
required?

yes

Perform Escalation Principle

Implementation of
Improvement Program review of effectiveness

yes

Improvement Program OK?

End

no

no

no

no

no

no

no

no

R: QSK / K-QS-4
S: Procurement VW Group, K-QS

R: QS MA VW Group
I: Supplier Mgmt.

R: QS MA VW Group
S: Supplier

R: QS MA VW Group
I: Supplier

R: Mgmt. VW Group
S: Supplier Mgmt.

R: QS MA VW Group
S: Supplier

R: QS MA VW Group
I: Supplier Mgmt.

R: QS MA VW Group
I: Supplier

R: Supplier
I: QS MA VW Group

R: QS MA VW Group
I: Supplier QS

R: QS MA VW Group

Input

Output

Guideline TRL
Catalogue of Criterias

Information
(Tel./Fax)

Formel Q Capability
(Section 10 & 15)
TRL Questionnaire
TRL Report

TRL Report

TRL Report

TRL Report

TRL Report

TRL Report

TRL Report

TRL Report

TRL Report

TRL Report

TRL Report

TRL Report

Improvement Program (IP)

Improvement Program (IP)

Guideline TRL

Guideline TRL

Improvement Program (IP)

Improvement Program (IP)

Improvement Program (IP)

Improvement Program (IP)

VW Group Data Storage

Figure 16: Flow diagram Technical Review Supplier
10. Technical Review Suppliers

10.4 Escalation principles

The escalation principle regulates the VW internal procedures and reactions. The individual escalation process steps are implemented by the severity of the detected problems and could during the TRL or later during problem solving be imposed.

**Escalation step 1**
Direct involvement required, inform Purchasing and the involved factories, initiate an improvement program.

**Escalation step 2**
Quality dialog required between the involved technical areas and management of both companies.

**Escalation step 3**
Quality dialog required at VW Group level including TOP management of both companies. Downgrading due to quality concerns to “C” during the TOP Q-communication phase is possible.
11. Documentation/Verification of the Formel Q Capability

Once the potential analysis, the process/product audit and/or the quality audit regarding D/TLD parts in the individual product groups, as well as after the realization of the problem analysis for example the Technical Review Supplier have been completed, the required actions are discussed with the supplier and the deadlines for the documentation of an improvement program and the respective implementation dates are set.

The information gained from the assessment is summarized in an audit report per the attachments. The report must be signed by a responsible manager of the supplier and by the Volkswagen Group auditor.

The evaluation results follows (identical to the certification evaluation process) the temporary grade from the Volkswagen Group auditor. The grade is finalized after review and counter signing by VW audit management.

The Process audit report contains (see section 6 and attachments):

- The total rating regarding the quality capability
- The evaluated product audit groups and related process steps
- The product audit report with the failure quantity per problem classification
- The improvement program with defined problem areas/characteristics
- The grade of the QM elements (only when doing a QM system evaluation)

The releases for the special requirements for D/TLD parts are separately provided in a D/TLD audit report if they are essentially fulfilled (see Section 8).

For problems detected during the supplier visit, which directly influence the parts quality, immediate actions must be agreed upon with the supplier which ensure the delivery quality according to customer requirements.

The audit results and the audit report as well as the relevant implementation status of the improvement program are made accessible to all affected areas in the Volkswagen Group.
11. Documentation/Verification of the Formel Q Capability

The supplier is obliged through the Volkswagen Group auditor to determine the corrective action of the improvement program agreed to with the auditor, to complete it and then present it to the responsible VW technical department. For this purpose, the improvement program must be completed with detailed information on actions carried out/intended. The individual implementation dates and responsibilities must be handed in by the agreed date to the auditing department of the Volkswagen Group.

The supplier is obliged as part of the self-assessment (see section 4) to check the effectiveness of the implementation of the improvement program in an internal audit. The Volkswagen Group expects from their suppliers that the completed self-assessment meet or exceed the agreed requirements of the improvement program in order to satisfy the demand for self-assessment.

Requirement Catalog

- Potential analysis (Section 12)
- Process audit (Section 13)
- Mandatory Documentation (D/TLD-parts) (Section 14)
- Self-assessment (see process audit Section 13)
- Technical Review Suppliers (Section 15)
12. List of Requirements for Potential Analysis

1. Requirements for the component / compliance with important characteristics

The qualification of the supplier for the specific requested product essentially depends on whether the requirements for this product, as defined in the specifications (the technical documents) can be complied with. The ability to comply with the important characteristics can be seen from special processes and quality sequences with regard to products for competitors, if necessary.

The following must, for instance, be considered:

- Capability analyses (Cpk values)
- Design and process FMEA
- Reliability values
- Required test, laboratory and measurement systems
- Required know-how

2. Experience / references

The experience of the supplier with equivalent products and with the specific requirements of the automotive industry is an important indicator for the qualification of the supplier. This includes the verification of an effective QM system by a certificate according to VDA 6.1 (or comparable). The qualification of the staff and their responsibility in the development and manufacturing processes are of particular importance.

Questions / subjects:

- Experience with equivalent parts
- Main percentage of the added value and influence on important characteristics through the supplier’s manufacturing process
- Realization of just-in-time concepts (Internally / Externally)
  - Internally: integrated order control, JIT
  - Externally: JIT, warehouse, direct delivery
- Effective and evaluated QM system
  - VDA 6.1 certificate
  - Third party audits
  - Self-audits, evaluation of process quality
  - VDA 6.3 self and third party audits
- Other process audits
12. List of Requirements for Potential Analysis

3. Process development options / project planning
The experience of the supplier with regard to the management of projects is of decisive significance for successful project handling. The evaluation can be carried out, based on past projects that have already been completed, the standard process plans for the project management of the supplier and the activities that have already been executed within the framework of the quotation for Volkswagen, such as, for instance feasibility studies.

Questions / subjects
– Nomination of project supervisors and regulations of the interfaces
– Project stages with specified targets
  – Time schedules determined
– Capacities available
  – Qualification of personnel
  – Pre-material
  – Buildings
  – Systems, tools, test instruments
- Containers
  – CAM
  – CAQ
– Compliance with the product-specific requirements
  – Customer requirements / legal requirements
  – Handling
  – Packaging
  – Design of workplace / test site
  – Process FMEA
  – Capability proofs for systems
  – Tools
  – Test instruments
– Communication facilities
  – Translation of documents
  – Data transfer
  – Data processing interfaces
– Securing of the above-mentioned points at sub-contractors
  – Project stages
  – Approval procedure
  – Targets
  – Capacities
  – Product requirements – purchased parts
  – Communication
12. List of Requirements for Potential Analysis

4. Q methods / Q techniques

Constant improvement of product quality according to the expectations of the customer is necessary to ensure competitiveness. VOLKSWAGEN suppliers are significantly involved in this continuous improvement process. The aptitude to be a VOLKSWAGEN supplier thus depends on the supplier's innovative capacity and his ability regarding systematic improvement. The application of quality methods and techniques is an important requirement in this regard. The technical conditions for component and damage analyses must also be available.

Questions / subjects:

– Preventive measures
  – Quality Function Deployment
  – Test planning, design of experiments
  – FMEA
  – Try-out
  – Fault tree analysis

– Tools to increase efficiency and quality
  – Continuous improvement process (CIP)
  – Lean production
  – Proposal system / Suggestion scheme
  – Quality committee

– Running quality improvement measures
  – Quality targets
  – Quality costs
  – Problem analyses

– Supplier’s test facilities (laboratory, measurement technology)
  – Receiving
  – Production
  – Customer care / customer satisfaction (service)
12. List of Requirements for Potential Analysis

5. Pre-material / purchased parts

To ensure customer satisfaction, the supplier must not only be able to control their own product. The supplier must also evaluate and qualify the processes of the sub-contractors according to their responsibility for the product. The security of supply for the customers and the reliable traceability of the product can only be ensured if the processes at the sub-contractors are also considered.

Questions / subjects

– Storage
  – Integrated storage system
  – Storage condition that safeguards against any damage
  – First-in first-out
  – Storage periods
  – Order, cleanliness
  – Identification

– Capability proofs / process optimization
  – Cmk, Cpk
  – Continuous improvement

– Supplier evaluation
  – Quality capability (with escalation procedure)
  – Q-performance (with escalation procedure)
  – Logistical performance

– Supplier qualification
  – Quality management agreements
  – Supplier audits

– Improvement program (with follow up)
12. List of Requirements for Potential Analysis

6. Customer care / customer satisfaction (service)

Suitable instruments must be used to secure the as-delivered quality. These instruments include, for instance, monitoring of problem resolution and of initiated corrective action, securing customer supply through defined emergency and failure strategies, monitoring of the delivery quality and of logistical requirements through product inspections and shipping audits.

Questions / subjects:

– Continuous contacts with customers
  – Development coordination at the customer
  – Communication facilities
  – Command of foreign languages
  – Knowledge regarding the use of the product

– Emergency and failure strategy
  – Interruptions in the manufacture and during transport
  – Shipping problems
  – PPS failures
  – Failures in the data transfer

– Execution of product audits, supplier’s test facilities
  – Also for purchased parts
    o Sub-groups
    o Installation tests
  – Re-qualification tests
  – Packaging
  – Identification

– Execution of reliability tests

– Problem resolution
  – Failure analyses
  – Determination of causes
  – Improvement program
  – Competent contact persons for problems that occur (preferable English speaking)

– Shipping logistics
  – Container control and maintenance
  – Shipping documents
  – Labels on parts / containers
12. List of Requirements for Potential Analysis

7. Production

The ratings with regard to the individual questions of the “7. Production” element represent a summary of all the process stages that are to be considered. One single weakness in one single process stage that has, however, a significant influence on the entire product will already result in a considerably negative evaluation of the respective question/subject field.

7.1 Process stages (applied process stages)

The process stages that are relevant to the potential product are evaluated. Audits and action to secure external processing stages might also be considered, where necessary. If the manufacture of the potential VW products is to be produced on existing systems, these must be used for the evaluation. Comparable processes, where available, should be evaluated if the supplier plans to purchase new systems. The auditor will additionally inspect the documents, such as timing plans or specifications, additional investments or “Lastenhefte” for the planned operating resources, where necessary.

Questions / subjects

– Suitable machines / systems
  – Capability studies
  – Automatic controls
  – Controls
  – Securing of parameters
  – Maintenance condition
  – Capacity

– Flexibility of the manufacturing / test systems

– Defective units / corrections

– Ergonomic design of the workplaces

– Staff qualification / supplier’s responsibility / allocation of tasks
12. List of Requirements for Potential Analysis

7.2 Process specifications / quality

Defined process control is a pre-condition to ensure a constantly high quality of the product. The determination and the compliance with the specifications for the parameters, the methods, the monitoring and the control of the product characteristics in the processes are considered for the evaluation.

Questions / subjects:

– Manufacturing and test specifications, reference parts
– Manufacture release
– SPC / fault summary cards / original value cards with identification of tendencies
– Logbook

7.3 Material flow

Possible quality losses of parts caused by internal transport are evaluated. In this regard, parts control to safeguard against incorrect assembly or the use of not O.K. parts as well as the impairment of quality caused by parts handling or unsuitable means of transport are of particular importance.

Questions / subjects

– Identification / transfer of O. K. parts
– Supply of components
  – Just in Time
  – Kanban
  – Short distances, transport without interruptions (direct flow)
– Quarantine parts store

– Parts handling
  – Suitable transport facilities / containers
  – Packaging
  – Overfilling
13. List of requirements for the process audit

Structure Requirements Catalog Process audit

Part A Product creation process

1. Product development/design (planning and implementation)
2. Process development (planning and implementation)

Figure 17: Product development process

Part B Series production

1. Suppliers/purchased parts
2. Production (each process stage)
   2.1 Personnel/qualification
   2.2 Production tooling/installation
   2.3 Transportation/parts handling/storage/packaging
   2.4 Fault analysis, corrective actions, continuous improvement
3. Customer care/customer satisfaction (service)

Figure 18: Series production
13. List of requirements for the process audit

Structure of the question catalog

Introduction
At each section of the requirements catalog (for example A1 Product development or B2.2 Production tooling installation) the general requirements are described in the introduction and special key areas are highlighted and explained. This area also summarizes the questions (requirements) presented.

Requirements/ Explanations
For each question in the requirements catalog the requirements for the process and procedures are listed more explicitly. Individual requirements are additionally named if necessary and explanations and instructions given.

These supplements must be understood as examples and not as complete requirements. They must be compared to the individual product and process and if necessary supplemented. For particular processes further requirements that are not presented in the question catalog can be of decisive importance.

Note:
The auditor assesses each process step based on the requirements in each process element to each section of the questionnaire. For each section an evaluation of each process step is required.

For auditing the process steps in production each process stage, which is not included in a continuous production line, enters the total assessment of the production as a stage requiring individual assessment.
The product and process development in the product creation process are orientated towards the four steps of the cycle of product quality planning (plan, do, analyze, improve). An interdisciplinary team approach and single-minded actions in all steps of the product development are prerequisites for the implementation of all requirements for the start of the series production of a product.

At the beginning of the product creation process, all customer requirements, market development tendencies, experience with similar products, standards and laws must be known and be properly incorporated in the core process and the supporting processes with consideration of changes during the product development.

The adherence to defined phases and set objectives of the product creation process must be verified by reviews at defined intervals. Deviations and changed requirements often lead to changed objectives.

The correct and proper use of risk analyses and analysis methods in the product creation process provides timely information on deviations and necessary corrective actions. They represent a considerable factor on cost optimization and cost limitation.

All employees involved in the project must demonstrate a high level of qualification and performance. Their single-minded actions in all steps of the product development is a prerequisite for the satisfaction of all customer requirements and a high quality start-up of the series production.
13. List of requirements for the process audit Part A

1 Product Development (Design)

1.1 Planning

As early as in the offer stage, planning specifications for a new product must be defined on the basis of customer requirements, applicable laws and internal company key requirements. After order acceptance, the planning specifications must be detailed and incorporated in a product development plan. All necessary tasks must be defined in the product development plan including achievable objectives and deadlines. The specific product requirements often exceed the customer requirements. They must be analyzed and specified in detail by the supplier. A continuous re-examination of all requirements during the planning phase can lead to changes.

1.1.1 Are the customer requirements available?

1.1.2 Is a product development plan available and are the set objectives adhered to?

1.1.3 Are all necessary capacities planned for the product development?

1.1.4 Are the product specifications and requirements determined and considered?

1.1.5 Has feasibility been determined on the basis of all current requirements?

1.1.6 Are the necessary personnel and technical prerequisites available or planned for completion of the project?

1.1.7 Have the respective planning activities been established and verified at the sub-contractors?
13. List of requirements for the process audit Part A

1.1.1 Are the customer requirements available?

Requirements/ Explanation

The following must, for example, be considered:

- Drawings, standards, specifications, list of customer requirements
- Logistic concepts
- Technical supply conditions, inspection and test instructions
- Quality agreements, agreements on objectives
- Important product and process characteristics
- Purchase order documents with item lists and delivery dates
- Laws/ directives (For example “Lists for declarable substances in the automobile industry – substances in components and materials” See also 1.1.4, 1.1.5, 1.1.7, 1.2.6)
- Waste disposal plans/ environmental aspects
- Transfer of important information to sub-contractors
- Certificate VDA6.1 and or ISO/TS 16949 must include design elements

1.1.2 Is a product development plan available and are the set objectives adhered to?

Requirements / Explanations

The product development plan is a key component of the project plan and correlates with the process development plan. All activities up to and including the start of series production including those of the subcontractors must be defined. The set objectives must be derived from the requirements and must adhere to the defined project steps.

The following must, for example, be considered:

- Customer requirements (Formel Q New Parts Integral)
- Costs
- Deadlines: planning release, procurement release, change control, prototypes, pre-series, start of series production
- Capacity study
- Definition and monitoring of objectives
- Regular information to the company management
- Simultaneous Engineering Teams (SET)
- Development plans of sub-contractors must be considered, where necessary
13. List of requirements for the process audit Part A

1.1.3 Are all necessary capacities planned for the product development?

Requirements / Explanations

The necessary capacities must be determined and considered as early as in the offer phase. After order issue this data must be specified more precisely. If necessary an update of the capacity study must be undertaken for changed requirements. The necessary resources must be planned and made available.

The following must, for example, be considered:

- Customer requirements
- Qualified personnel (including foreign language skills)
- Downtimes
- Throughput times
- Buildings, premises (for test build and prototype construction)
- Tooling/ equipment
- Inspection, test and measuring equipment, laboratory equipment
- CAD, CAM, CAE

1.1.4 Are the product specifications and requirements determined and considered?

Requirements / Explanations

The product requirements should be established through interdisciplinary teamwork and benchmarking using such methods as, for example, QFD and DOE. Previous experience and future oriented expectations must be incorporated in the investigation. The product requirements must correspond to the market demands and meet the customer expectations. The product must be competitive.

The following must, for example, be considered:

- Customer requirements
- Corporate objectives
- Simultaneous engineering
- Robust design / secure process
- Regular customer / sub-contractor discussions
- Important characteristics, legal requirements (For ex. declarable substances 1.1.1, 1.1.5, 1.1.7, 1.2.6)
- Functional dimensions
- Installation dimensions
- Material
13. List of requirements for the process audit Part A

1.1.5 Has feasibility been determined on the basis of all current requirements?

Requirements / Explanations

The known requirements must be checked for feasibility through interdisciplinary teamwork with focus on the customer requirements.

The following must, for example, be considered:

- Design, construction
- Quality
- Process equipment, capacity
- Special characteristics
- Corporate objectives
- Regulations, standards, laws
- Environmental compatibility (For example “Lists for declarable substances in the automobile industry – substances in components and materials” See also 1.1.4, 1.1.5, 1.1.7, 1.2.6)
- Deadlines, time frames, (deadline planning of customer/sub-contractor to be considered)

1.1.6 Are the necessary personnel and technical prerequisites available or planned for completion of the project?

Requirements / Explanations

The personnel qualification and the required resources must be established before project start and defined in the project plan.

The following are, for example, to be considered:

- Project management, project planning team, responsibilities (involvement of sub-contractors)
- Qualified personnel (including foreign language skills)
- Technical communication (data transfer)
- Information flow from and to the customer during planning (regular meetings, conferences)
- Tooling and facilities
- Inspection, test and measuring equipment, laboratory equipment
- CAD, CAM, CAE
13. List of requirements for the process audit Part A

1.1.7 Have the respective planning activities been established and verified at the sub-contractors?

Comprehensive project management must also be established for purchased parts and purchased services. The activities of the supplier and the respective sub-contractors must be coordinated with each other. The project management of the supplier must consider the tasks of the sub-contractors. Responsibilities must be clearly defined. The supplier must have evaluated the capabilities of the sub-contractors regarding project processing before the project is started. With the start of the project, the suppliers will convince themselves that the sub-contractor carries out the planning activities in a comprehensive manner. The updating of the planning must be checked during the project at regular intervals.

The following must, for example, be considered:

- Audit reports
- Records of visits
- Proof documents, release certificates, project reports of the sub-contractor
- Important characteristics, legal requirements (For ex. declarable substances 1.1.1, 1.1.4, 1.1.5, 1.2.6)
- Minutes of coordination meetings, workshops, simultaneous engineering teams
- Milestone reviews, reports of the supplier at the sub-contractor
13. **List of requirements for the process audit Part A**

1.2 **Implementation**

During the implementation phase of the product development, all the tasks that were defined in the product planning phase must be carried out. It is the decisive task of the project supervisor/project management to involve all the interface departments in all the tasks at an early stage and to inform the management and, if necessary, also the customer of any problems that might occur. Close cooperation and coordination with the sub-contractors is also required. The sub-contractors can be involved in the “simultaneous engineering teams”. During the implementation reviews must be undertaken at defined intervals. In case of not achieving the set targets, corrective actions must be defined, implemented and followed up to ensure their effectiveness.

1.2.1 Has the design FMEA been performed and have improvement actions been defined?

1.2.2 Has the design FMEA been updated during the project and have the defined actions been implemented?

1.2.3 Has a quality management plan been established?

1.2.4 Are all the necessary releases planned and / verification available?

1.2.5 Are the required capacities available?

1.2.6 Have the respective activities at sub-contractors been inspected and have proofs been submitted?
13. List of requirements for the process audit Part A

1.2.1 Has the design FMEA been performed and have the improvement actions been defined?

Requirements / Explanations

The product risks shall be clarified and continually reduced by suitable actions through an interdisciplinary team approach including customers and suppliers. For complex parts or complete function systems, the use of a system FMEA is useful (see VDA volume 4, part 1 and 2). Other comparable analysis techniques shall be agreed with the customer.

The following must, for example, be considered:

- List of customer requirements (specifications)
- Function, safety, reliability, maintainability, important characteristics
- Environmental aspects
- Involvement of all affected areas
- Test results
- Product specific actions resulting from the process FMEA (the actions at sub-contractors must also be considered)

1.2.2 Has the design FMEA been updated during the project and have the defined actions been implemented?

Requirements / Explanations

The person responsible for the project must assess product and process changes. In accordance with the FMEA team a new analysis should be initiated if necessary. Updating is also necessary after implementation of actions (design review).

The following must, for example, be considered:

- Customer requirements
- Important parameters and characteristics, legal requirements - function, installation dimensions
- Material
- Environmental aspects
- Transportation (Internal / External)
- Product specific actions resulting from the process FMEA (the actions at sub-contractors must also be considered)
13. List of requirements for the process audit Part A

1.2.3 Has a quality management plan been established?

Requirements / Explanations

The quality management plan must contain components, modules, subassemblies, parts and materials and include the production processes of the prototype phase and the pre-series phase for the respective product. The quality management plan is a living document and must be updated for new and modified products. A quality management plan must normally be drawn up for the following phases:

Prototype Phase

A description of the dimensional checks and the material and functional inspections which must be carried out during prototype construction (if required by the customer).

Pre-Series Phase (interface to the process development)

A description of the dimensional checks and the material and functional inspections which must be carried out after prototype construction and before series production.

It must provide details of, among others:

- Definition and identification of significant characteristics
- Preparation of the inspection sequence plan (control plan)
- Supply of facilities and equipment
- Timely proactive supply of inspection, measuring and test equipment
- Inspections at functional locations of the product implementation and during the product process
- Clarification of acceptance criteria
- Release activities for purchased parts
13. List of requirements for the process audit Part A

1.2.4 Are all the necessary releases planned and/verification available?

Requirements / Explanations

The releases and verification of suitability are to be verified for all individual parts, modules and supplied parts.

The following must, for example, be considered:

- Product testing (e.g. installation tests, functional tests, life test, environmental simulation)
- Status of prototype parts
- Pre-series sample
- Production and inspection equipment, inspection and test equipment for pilot built
- Release/test status of components of the sub-contractors

1.2.5 Are the required capacities available?

Requirements / Explanations

The necessary capacities are to be derived from the offer calculation and the advanced planning. They must be available or planned and made available at the defined time. The required resources must be included in the project.

The following must, for example, be considered:

- Customer requirements
- Qualified personnel (including foreign language skills)
- Downtimes
- Throughput times
- Buildings, premises
- Pilot build
- Prototype build
- Tooling, facilities
- Inspection, measuring and test equipment, laboratory equipment
- Planning (deadline/scope) for purchased services
13. List of requirements for the process audit Part A

1.2.6 Have the respective activities at sub-contractors been inspected and has the relevant evidence been submitted?

The supplier must convince himself of the progress of the project realization at his sub-contractors at regular intervals. Suitable milestones and checklists must be established in the project management of the supplier to ensure that the activities of the sub-contractors are monitored so that deviations can be determined at an early stage and suitable counter-action can be initiated.

The following should, for instance, be considered:

- Audit reports
- Records of visits
- Proof documents, release certificates, project reports of the sub contractor
- **Important characteristics, legal requirements (For ex. declarable substances 1.1.1, 1.1.4, 1.1.5, 1.1.7)**
- Minutes of the coordination meetings, workshops, simultaneous engineering teams
- Milestone inspections, reports of the supplier at the sub-contractor
13. List of requirements for the process audit Part A

2 Process Development

2.1 Planning

As early as in the offer phase, basic planning for the product manufacturing must be undertaken based on customer and additional requirements which must be detailed after order acceptance and defined in a process development plan. Technical and personnel capacities already available must be considered and expansions planned ahead of time. In the actualization of all tasks, set objectives and deadlines for all interfaced areas must be incorporated by an interdisciplinary team approach. All tasks and responsibilities must be clearly defined. During the process planning and implementation phase changes can become necessary due to changed customer requirements or special legal stipulations. This could also necessitate a re-examination of the planning approach.

2.1.1 Are the product requirements available?

2.1.2 Is a process development plan available and are the set objectives adhered to?

2.1.3 Are all capacity requirements planned for series production?

2.1.4 Have the process specifications and requirements been determined and considered?

2.1.5 Are the necessary personnel and technical pre-requisites available or planned for completion of the project?

2.1.6 Has the Process FMEA been prepared and are the improvement actions defined?

2.1.7 Have the respective planning activities been established and proven at the sub-contractor as well?
13. List of requirements for the process audit Part A

2.1.1 Are the product requirements available?

Requirements / Explanations

All product requirements must be known and incorporated in the planning.

The following must, for example, be considered:
- Customer requirements
- Laws, standards, regulations
- Logistics concepts
- Technical terms of delivery
- Quality/ target agreements
- Important characteristics
- Materials
- Waste disposal, environmental protection
- Requirements that are important to the sub-contractors must be communicated to them

2.1.2 Is a process development plan available and are the set objectives adhered to?

Requirements / Explanations

The process development plan is a key component of the project plan and correlates with the product development plan. All activities up to and including the start of series production must be defined. The set objectives must be derived from the requirements and must adhere to the defined project steps.

To be considered are:
- Customer requirements
- Costs
- Milestones: planning release, procurement release, prototypes, pre-series, start of series production
- Capacity study
- Availability of facilities, inspection, measuring and test equipment, software, packaging
- Safeguarding concept for changes (start-up problems etc.)
- Logistic and delivery concept
- Definition and monitoring of objectives
- Regular information to the company management
- Development plans of sub-contractors must be considered, where necessary
13. List of requirements for the process audit Part A

2.1.3 Are all capacity requirements planned for series production?

Requirements / Explanations

The necessary capacities must be determined and considered as early as in the offer phase. After order issue that data must be specified more precisely. If necessary an update of the capacity study must be undertaken for changed requirements. The necessary resources must be planned and made available.

The following must, for example, be considered:

- Customer requirements
- Availability of purchased material
- Qualified personnel (including foreign language skills)
- Absence times, downtimes
- Throughput times, units per facility or equipment
- Buildings, premises
- Production equipment, tooling, facilities, inspection, measuring and test equipment, tooling aids, laboratory equipment
- Means of transportation, containers, storage
- CAM, CAQ

2.1.4 Have the process specifications and requirements been determined and considered?

Requirements/ Explanations

The process requirements should be established through interdisciplinary teams using such methods as, for example, QFD and DOE. Previous experience and future-oriented expectations must be incorporated in the investigation.

The following must, for example, be considered:

- Customer requirements
- Legal requirements
- Capability verification
- Suitability of production equipment, tools, test and inspection equipment
- Design of work places and inspection sites
- Handling, packaging, storage, identification
13. List of requirements for the process audit Part A

2.1.5 Are the necessary personnel and technical pre-requisites available or planned for completion of the project?

Requirements / Explanations

Personnel qualification and resources must be established before project start and be defined in the project plan.

The following must, for example, be considered:

- Project management, project planning team, responsibilities
- Qualified personnel (including foreign language skills)
- Production equipment, tooling, facilities, inspection, measuring and test equipment, tooling aids, laboratory equipment
- Technical communication (data transfer)
- Information flow from and to the customer during planning (regular meetings, conferences)
- CAM, CAQ

2.1.6 Has the Process FMEA been prepared and are the improvement actions defined?

Requirements / Explanations

The product risks should be clarified and continually reduced by suitable actions through an interdisciplinary team approach including customers and suppliers. For complex parts or complete functional systems, the use of a system FMEA is useful (see VDA volume 4, part 1 and 2).

The following must, for example, be considered:

- All manufacturing steps, also for sub-contractors
- Customer requirements, function
- Important parameters and characteristics
- Traceability, environmental aspects
- Transportation (internal/external)
- Incorporation of all affected areas
- Product specific actions from the design FMEA
13. List of requirements for the process audit Part A

2.1.7 Have the respective planning activities been established and proven at the sub-contractor as well?

A comprehensive project management must also be established for purchased parts and purchased services. The activities of the supplier and the respective sub-contractors must be coordinated with each other. The project management of the supplier must consider the tasks of the sub-contractors. Responsibilities must be clearly defined. The supplier must have already evaluated the capabilities of the sub-contractors regarding project processing before the project is started. With the start of the project, the supplier will convince himself that the sub-contractor carries out the planning activities in a comprehensive manner. The update of the planning activities must be checked during the project at regular intervals.

The following must, for example, be considered:

- Audit reports
- Records of visits
- Proof documents, release certificates, project reports of the sub-contractor
- Minutes of coordination meetings, workshops, simultaneous engineering team
- Milestone inspections, reports of the supplier at the sub-contractor
13. List of requirements for the process audit Part A

2.2 Implementation

During the implementation phase of the process development all tasks defined in the process planning phase must be carried out. Possible changes must be recognized and taken into consideration. For the purpose of project management and control a project leader must involve all interfacing areas as early as possible. The project leader must report problems as quickly as possible to the management and, if necessary, to the customer. In the implementation phase reviews have to be undertaken at defined intervals. In case of not achieving the set targets, corrective actions must be defined, implemented and followed up to monitor their effectiveness.

2.2.1 Has the process FMEA been updated in case of project changes and have the defined actions been implemented?

2.2.2 Has a Quality Management Plan been established?

2.2.3 Are all necessary releases planned and qualification records available?

2.2.4 Has a pre-production run been carried out under the conditions of series production for the release of series production?

2.2.5 Are the production and inspection documents available and complete?

2.2.6 Are the required capacities available?

2.2.7 Have the respective activities at the sub-contractor been inspected and has the relevant evidence been submitted?
13. List of requirements for the process audit Part A

2.2.1 Has the process FMEA been updated in case of project changes and have the defined actions been implemented?

Requirements / Explanations

The person responsible for the project must assess product and process changes. In accordance with the FMEA team a new analysis should be initiated if necessary. Updating is also necessary after the implementation of actions.

The following must, for example, be considered:

- Customer requirements
- All production steps, also of sub-contractors
- Important parameters and characteristics, legal requirements
- Installation dimensions
- Material
- Traceability, environmental aspects
- Transportation (internal/ external)
- Process relevant actions from the design FMEA

2.2.2 Has a Quality Management Plan been established?

Requirements / Explanations

The quality management plan must contain components, modules, subassemblies, parts and materials and include the production processes for the respective product. The quality management plan is a living document and must be updated for new/changed processes/products.

A quality management plan must normally be drawn up for the following phases:

- Pre-series phase (Interface to product development)
  A description of the dimensional checks and the material and functional inspections which must be carried out before series production.
- Series production phase
  A comprehensive documentation of the product and process characteristics, the process control measures, the inspections and the measurement systems that must be considered during series production.
13. List of requirements for the process audit Part A

The QM plan must provide details of (among others):

- Definition and identification of significant characteristics
- Preparation of the inspection sequence plan (also interfaces to sub-contractors)
- Supply of facilities and equipment
- Timely proactive supply of inspection, test and measuring equipment
- Inspections at appropriate production stages
- Clarification of acceptance criteria

2.2.3 Are all necessary releases planned and qualification records available?

Requirements / Explanations

The releases and verification of suitability are to be verified for all individual parts, modules, subassemblies, supplied parts, production equipment, and inspection, test and measuring equipment.

The following must, for example, be considered:

- Product testing (e.g. installation tests, functional tests, life tests, environmental simulation)
- Pre-series and 0-series parts
- Initial samples
- Capability records for important product and process characteristics
- Logistic concepts (e.g. suitability of packaging through test distribution and alternatives for special packaging)
- Tools, machines, equipment, test and inspection equipment
- Proofs regarding purchased parts / sub-contractors
13. List of requirements for the process audit Part A

2.2.4 Has a pre-production run been carried out under the conditions of series production for the release of series production?

Requirements / Explanations

A pre-production run is necessary to assess all production factors and influences in time and if necessary, to correct them. Production bottlenecks and quality losses should be avoided during series production.

The following must, for example, be considered:

- Customer requirements
- Definition of minimum quantities
- Process capability study, capability of measuring instruments
- Measurement system capability
- Readiness for series production of facilities and production equipment (measurement records)
- Initial sample inspection
- Handling, packaging, identification, storage
- Personnel qualification (including foreign language skills)
- Work and inspection instructions
- Layout of work places and inspection sites
- Acceptance of pre-production at sub-contractors

2.2.5 Are the production and inspection documents available and complete?

Requirements / Explanations

Process parameters and inspection characteristics must always be specified with tolerances. The production and inspection documents must always be available at the work place and inspection site respectively. In case of any deviations, corrective action must be introduced and documented.

Details are, for example:

- Process parameters (e.g., pressures, temperatures, times, speeds)
- Data for machines, tools, tooling aids
- Inspection specifications (important characteristics, inspection and test equipment, inspection and test methods, inspection frequencies)
- Control limits of statistical process control charts
- Machine and process capability records
- Operating instructions
- Work instructions, inspection instructions
- Information on current deviations
13. List of requirements for the process audit Part A

2.2.6 Are the required capacities available?

Requirements / Explanations

The necessary capacities are to be derived from the quotation and the current process development conditions.

The following must, for example, be considered:

- Customer requirements
- Availability of purchased material
- Qualified personnel (including foreign language skills)
- Absenteeism, downtimes
- Throughput times, units per production equipment
- Buildings, premises
- Production equipment, tooling, facilities, inspection, test and measuring equipment, tooling aids, laboratory equipment
- Means of transportation, containers, storage

2.2.7 Have the respective activities at the sub-contractors been inspected and has the relevant proofs been submitted?

The supplier must convince himself of the progress of the project realisation at his sub-contractors at regular intervals. Suitable milestones and checklists must be established in the project management of the supplier to ensure that the activities of the subcontractors are monitored so that deviations can be determined at an early stage and suitable counter-action can be initiated. The evaluation of the actual status of the operating resources (systems, tools, gauges) is essential for assessing the progress of the project.

The following should, for instance, be considered:

- Audit reports, records of visits
- Status evaluation of the operating resources, tool acceptances
- Proof documents, release certificates, project reports of the sub contractor
- Minutes of the coordination meetings, workshops, simultaneous engineering teams
- Milestone reviews, reports of the supplier at the sub-contractor
13. List of requirements for the process audit Part B

Part B Series production

Diagram 18: Series production

The prerequisite of a series production with satisfactory process capabilities is the strict implementation of all required actions resulting from the product development process. Considering the customer requirements, the processes at the sub-contractors, in their own production, product delivery and utilisation must be evaluated and improved on a continuous basis.

Customer oriented actions in all processes is the prerequisite for customer satisfaction regarding quality, price, service and innovation. It is the responsibility of the management to provide for the necessary preconditions in all processes.

The quality performance is determined by man, machine, material, method and environment, and by lean production processes, low stock levels and highly qualified employees. The responsibility of employees must be characterised by independent recognition of product and process nonconformities. Improvement actions must be initiated and implemented under their own initiative.

The processes and process steps must be continually evaluated using suitable methods. Nonconformities must be analysed and appropriate corrective actions carried out to maintain and improve the process capability and to meet all requirements relating to zero defect demands of the customer.

The supplier is obliged to observe his products after production in order to maintain and improve customer satisfaction. Active cooperation with the customer, and early recognition of concerns and nonconformities are the basis for a long term trusting relationship.
13. List of requirements for the process audit Part B

1 Sub-contractors / Purchased Material

Reduced supply times to the customer (e.g. just in time) and reducing the throughput times influence the procurement time and require special activities in the individual process steps. A smooth system that is free of defects is required in this regard as it is usually not possible to compensate for failures or delivered defects by using alternative parts or materials. If only a small or no temporary stock volume is available, quantitative or logistical interruptions cause direct production interruptions.

The supplier and his sub-contractors have the responsibility and the duty to secure the processes and process sequences and to ensure the process capability with regard to all the customer-relevant and important characteristics for the respective products / materials. The supplier’s process and product audits after the risk analyses are required in this regard. The quality capability of sub-contractors can also be proven by a first or third party audits. The effectiveness of corrective action and of continuous improvement must be proven. **If modules are delivered, the supplier is fully responsible for the quality of all the individual components (this includes VW assigned suppliers).**

1.1 Are only approved and qualified sub-contractors used?

1.2 Is the quality of purchased parts assured?

1.3 Is the quality performance evaluated and are improvement actions initiated in case of nonconformities to the requirements?

1.4 Are continuous improvement activities and objectives for products and processes agreed with the sub-contractors and implemented?

1.5 Are the necessary releases available for all supplied series products and are the required improvement actions implemented?

1.6 Are the agreements relating to products supplied by the customer adhered to?

1.7 Are the stock levels of purchased material in line with the production requirements?

1.8 Are purchased materials and internal surpluses delivered and stored appropriately?

1.9 Is the staff qualified for their individual tasks?
13. List of requirements for the process audit Part B

1.1 Are only approved and qualified sub-contractors used?

Requirements / Explanations

Prior to the acceptance of sub-contractors, an assessment of their quality management system (certification, auditing) must be available. Before the start of series production, it must be ensured that only qualified subcontractors are used. Experience from analysing the quality performance of the sub-contractors must be considered.

The following must, for example, be considered:

- Discussions with the sub-contractors, regular sub-contractor follow-up
- Assessment of the quality capability, e.g. audit results and certificates
- Assessment of the quality performance (quality, cost, service)
- Selection according to ranking of the quality performance (quality/costs/service)
- Special release for D/TLD sub-contractors

1.2 Is the quality of the purchased parts assured?

Requirements / Explanations

The following must, for example, be considered:

- Sufficient inspection equipment (laboratory and measurement equipment).
- Internal and external inspections
- Gauges and fixtures supplied by the supplier to the sub-contractors
- Drawings, order details, specifications
- Quality assurance agreements
- Agreements on inspection and test methods, inspection and test sequences, inspection and test frequencies
- Analysis of key nonconformities
- Acceptable capability documentation (in particular for critical characteristics of products and processes)
13. List of requirements for the process audit Part B

1.3 Is the quality performance evaluated and are improvement actions initiated in case of nonconformities to the requirements?

Requirements / Explanations

The capabilities and performance of sub-contractors should be checked at defined time intervals. The results must be analysed and recorded, by part number, in a list (sub-contractors list). In case of negative results, qualification programs must be defined and their implementation must be verified. If modules are delivered, the supplier is fully responsible for the quality supervision regarding all the individual components.

The following must, for example, be considered:

- Minutes of quality meetings
- Agreement and follow-up of improvement programs
- Inspection, test and measurement records of improved parts
- Analysis of key nonconformities and problem subcontractors
- Evaluation of the quality performance (quality / costs / service)

1.4 Are continuous improvement activities and objectives for products and processes agreed with the sub-contractors and implemented?

Requirements / Explanations

The task is of particular significance to the delivery of modules. The supplier is fully responsible for a continuous improvement of the subcontractor.

The following must, for example, be considered:

- Workshops (interdisciplinary work groups)
- Definition of measurable indicators for quality, cost optimisation and service, for example:
  ° Reduction of inspection time with simultaneous increase in process capability.
  ° Reduction of rejects (internal/ external)
  ° Reduction of excess WIP, stock etc.
  ° Increase in customer satisfaction
13. List of requirements for the process audit Part B

1.5 Are the necessary releases available for all supplied series products and are the required improvement actions implemented?

Requirements / Explanations

Prior to the series production of new or changed products and processes a release must be approved for all products of sub-contractors. If modules are delivered, the supplier is fully responsible for the quality supervision of all the individual components.

The following must, for example, be considered:

- Customer information (specifications/standards/test specifications, etc.)
- Design and test releases
- Initial sample reports according to VDA
- Capability records for important characteristics
- Observation of EU safety data sheets and "List for declarable substances in the automobile industry – substances in components and materials" (see IMDS)
- Analysis of reliability
- Re-qualification test reports

1.6 Are the agreements relating to products supplied by the customer adhered to?

Requirements / Explanations

The requirements for customer-supplied products can be taken from the quality agreements and must be strictly implemented.

Customer-supplied products can be
- Services
- Tools, test and inspection equipment
- Packaging
- Products

The following must, for example, be considered:

- Control, verification, storage, transportation, maintenance of quality and characteristics (expiration date)
- Information flow for deficiencies or losses.
- Q documentation (Q level, Q history)
13. List of requirements for the process audit Part B

1.7 Are the stock levels of purchased material in line with the production requirements?

Requirements / Explanations

The necessary stock levels must already be determined and considered in the process planning phase. For changed requirements the analysis of the necessary stock levels must be updated if necessary.

The following must, for example, be considered:

- Customer requirements
- KANBAN, just in time.
- Storage costs
- Contingency strategy for purchased material bottlenecks
- FIFO (first in first out)

1.8 Are purchased materials and internal surpluses delivered and stored appropriately

Requirements / Explanations

Delivered pre-materials and returned residual quantities from the production must be stored according to the release status and in a manner to safeguard against any damage or mix-up. Suspect/defective products must be transferred to a quarantine storage area.

The following must, for example, be considered:

- Packaging
- Storage administration system
- FIFO (first in first out) / batch-related use
- Order and cleanliness (housekeeping)
- Climatic conditions
- Protection from damage, dirt and corrosion
- Identification (traceability, inspection status, job sequence, use status)
- Prevention of mix ups
- Quarantine storage (arranged and used)
13. List of requirements for the process audit Part B

1.9 Is the staff qualified for their individual tasks?

Requirements / Explanations

The staff that is responsible for the following activities must, for example, be considered:

- Selection, assessment and qualification of sub-contractors
- Product inspection
- Storage and transportation
- Logistics

Knowledge must be available of e.g.:

- Product, specifications, special requirements
- Special knowledge with regard to the product characteristics and the manufacturing sequences of the individual parts of modules
- Standards, laws
- Packaging
- Processing
- Assessment methods (e.g. audits, statistics)
- Quality techniques (e.g. 8D method, cause and effect diagram)
- Foreign languages
13. List of requirements for the process audit Part B

2. Production (each process stage)

In the individual process stages for the manufacture of a product, the planned and implemented technical and personnel procedures and process sequences must be maintained, monitored and continually improved under consideration of economic aspects. Key focus areas of this element are, employee satisfaction, process capabilities, inspection, test and measuring equipment and their improvement, as well as specific transportation and storage conditions for the product.

The basis of all the activities are the customer requirements for each product and the related processes. All the changes that are implemented until the production of the product is stopped must be integrated. All changes must be recognised early and be incorporated in the individual processes. The customer requirement for zero defects must be present in all process steps and the management of the company must provide the necessary prerequisites.

The relationship between customer and supplier must also play an important role in all internal processes. The internal customer / supplier relationship must be characterised by quality circles and teamwork. The personnel involved in the respective process stage must be given specific individual responsibility.

All changes in the manufacture of a product must be relayed to the customer who decides to what extent additional qualification actions or new releases are necessary (see also VDA booklet volume 2).
13. List of requirements for the process audit Part B

2.1 Personnel, Qualification

It is the responsibility of management to select employees according to the requirements of their job, to maintain their qualification, and to develop them for further jobs with additional requirements. The qualification of the employees for their relevant tasks in product and process must be traceable. The employees must know the customer requirements and quality objectives. The tasks assigned to them must visibly demonstrate individual responsibility for quality. Based on a capacity analysis, sufficiently qualified personnel must be selected and used for all processes. Necessary replacement personnel must be determined for the individual processes. Here too, qualified personnel must be available.

2.1.1 Are responsibilities and authority assigned to the personnel who control the product and process quality?

2.1.2 Are responsibilities and authority assigned to personnel with regard to the production equipment and the production environment?

2.1.3 Are the employees qualified to complete the defined tasks and is their qualification maintained?

2.1.4 Does a personnel plan exist, which includes replacement guidelines?

2.1.5 Is there a system for employee motivation and is it used effectively?
13. List of requirements for the process audit Part B

2.1.1 Are responsibilities and authority assigned to the personnel who control the product and process quality?

Requirements / Explanations

The following must, for example, be considered:

- Initiation of improvement programs
- Worker self-inspection
- Process release (equipment release, initial unit inspection/ final unit inspection)
- Process control (interpretation of control charts)
- Quarantine authority

2.1.2 Are responsibilities and authority assigned to personnel with regard to the production equipment and the production environment?

Requirements / Explanations

The following must, for example, be considered:

- Order and cleanliness (housekeeping)
- Performance or initiation of repairs and maintenance, total productive maintenance (predictive/preventive)
- Availability of parts, storage
- Setting up and calibration of inspection, test and measurement equipment

2.1.3 Are the employees qualified to complete the defined tasks and is their qualification maintained?

Requirements / Explanations

The following must, for example, be considered:

- Records of induction training, training and qualification regarding the process
- Knowledge of the product and possible /occurred product non conformance
- Instruction in occupational health and safety regulations, and environmental aspects
- Instruction in handling components requiring documentation
- Qualification records (e.g. welding certificate, eye test, drivers license for factory vehicles)
13. List of requirements for the process audit Part B

2.1.4 Does a personnel plan exist, which includes replacement guidelines?

Requirements / Explanations

Personnel planning must consider absences (sick leave, holiday, vacation, training). It must be ensured that the replacement personnel has the necessary qualification.

The following must, for example, be considered:

- Shift plan (contract related)
- Qualification record (qualification matrix)
- Work analysis, time studies

2.1.5 Is there a system for employee motivation and is it used effectively?

Requirements / Explanations

The willingness to perform better and quality awareness must be promoted through targeted information.

The following must, for example, be considered:

- Quality information (target to actual values)
- Improvement suggestions
- Special voluntary activities (additional training, quality circles)
- Low absenteeism levels
- Contribution to quality improvement
- Self assessment

Note: This question relates also question 2.4.6
13. List of requirements for the process audit Part B

2.2 Machinery / equipment

The production equipment must be capable of fulfilling the quality requirements for the product. The required process capability must be achieved and maintained. Inspection, test and measuring equipment must equally meet these requirements. When restarting production, special requirements must be adhered to. Appropriate work and inspection stations must be established. Both product and process must obtain release before start of production. Quality and process data from the previous production run must be known. All defined improvement actions must be implemented.

2.2.1 Does the available production equipment and tooling ensure that the quality requirements for the product are met?

2.2.2 Can the quality requirements be effectively monitored with the measurement and inspection equipment used?

2.2.3 Are the work and test stations laid out according to the process requirements?

2.2.4 Are the relevant details fully completed and adhered to in the production and inspection documents?

2.2.5 Is the appropriate equipment and tooling available to support product changeover?

2.2.6 Is a release provided for start of series production and are set up data and deviations recorded?
13. List of requirements for the process audit Part B

2.2.1 Does the available production equipment and tooling ensure that the quality requirements for the product are met?

Requirements / Explanations

The process capability of selected important product/process characteristics must be determined and continuously be improved. $C_{mk} / P_{pk}$ values of greater than or equal to 1.67 must be reached for the short-term process capability (MCS) and the provisional process capability (PCS). The minimum requirement for the long-term process capability $C_{pk}$ is greater than or equal to 1.33 with continuous improvement.

The following must, for example, be considered:

- Machine and process capability verification for important characteristics and process parameters
- Forced control, control of important parameters
- Warning mechanism to detect deviations from limiting specifications (e.g., warning lights, alarms, process shut downs)
- Load and unload fixtures - service and maintenance status of tools, equipment and machinery (including planned maintenance)

2.2.2 Can the quality requirements be effectively monitored with the measurement and inspection equipment used?

Requirements / Explanations

The following must, for example, be considered:

- Reliability, functional, and corrosion resistant tests
- Measuring accuracy, measurement system capability
- Data acquisition and potential for data evaluation
- Calibration records for inspection, test and measuring equipment
13. List of requirements for the process audit Part B

2.2.3 Are the work and test stations laid out according to the process requirements?

Requirements / Explanations

The working environment (also for rework) must be coordinated with the work content and the products in order to prevent soiling, damages, mix up and misinterpretation.

The following must, for example, be considered:

- Ergonomics
- Lighting
- Order and cleanliness (housekeeping)
- Environmental protection
- Working environment, handling of parts and components
- Occupational health and safety regulations

2.2.4 Are the relevant details fully completed and adhered to in the production and inspection documents?

Requirements / Explanations

Process parameters and inspection, test and measuring characteristics must always be specified with tolerances. The production and inspection documents must always be available at the work place and inspection station respectively. Nonconformities and corrective actions must be documented.

The following must, for example, be considered:

- Process parameters (e.g., pressures, temperatures, time, speed)
- Data regarding machines / tools / auxiliary equipment
- Inspection and test specifications (important characteristics, test and inspection equipment, methods, and frequencies)
- Control limits of control charts -machine and process capability verification
- Operating instructions
- Work instructions
- Inspection and test instructions
- Information regarding the latest failure analysis
13. List of requirements for the process audit Part B

2.2.5 Is the appropriate equipment and tooling available to support product changeover?

Requirements / Explanations

The following must, for example, be considered:
- Set-up plans
- Set up aids, reference aids
- Flexible tool change equipment
- Boundary / reference samples

2.2.6 Is a release provided for start of series production and are set up data and deviations recorded?

Requirements / Explanations

"Release for series production" is the order related release for the initial start of production as well as for a production restart after interruption. The release is necessary for product and process and must be provided by authorised personnel in writing on the basis of defined acceptance criteria. All known problems from the product and process planning phase, and from previous series production must be eliminated. The release inspections must be performed according to clear inspection instructions in order to ensure reproducibility. A check list is useful for this purpose. If production is continued, without the required inspection, the products must remain quarantined until the required inspection has been conducted and the products are found to be acceptable. A release is also required for products that have been reworked.

The following must, for example, be considered:
- New or changed product
- Stoppage of the equipment, process interruption
- Repair, tooling change
- Material change (e.g., batch change)
- Changed production parameters
- First off inspection with documentation
- Relevancy of parameter data
- Order and cleanliness of the work site
- Packaging
- Release and change status of tooling, and inspection, test and measuring equipment
13. List of requirements for the process audit Part B

2.3 Transportation / Parts Handling/ Storage/ Packaging

Production steps must continually be coordinated with each other, with only the customers required amount being produced. Intermediate storage of products should be avoided. The production and inspection status of parts must be recognisable by appropriate identification. Assembly parts, rejects and rework parts require special supervision and identification. Storage and transportation equipment must be coordinated, for the entire process chain, with the specific product manufactured for the customer, and may not have a damaging effect on the product. With longer production stoppages, tools, production equipment, and inspection, test and measuring equipment must be suitably preserved and stored in order to prevent damage. Renewed, immediate use without lengthy preparation must be ensured.

2.3.1 Are the production volumes planned in accordance with customer demand and conveyed as planned to the next production step?

2.3.2 Are products and components appropriately stored and are the transportation means and packaging equipment coordinated with the specific characteristics of the products/components?

2.3.3 Are reject, rework, set-up parts and excess material conscientiously separated and identified?

2.3.4 Is the material and parts flow secured against mixing/confusion and is traceability ensured?

2.3.5 Are tools, facilities, and inspection, test and measuring equipment stored appropriately?
13. List of requirements for the process audit Part B

2.3.1 Are the production volumes planned in accordance with customer demand and conveyed as planned to the next production step?

Requirements / Explanations

The following must, for example, be considered:

- Appropriate transportation means
- Defined storage locations
- Minimal or no intermediate storage
- KANBAN
- Just in time
- First in first out
- Store management
- Change status
- Only conveyance of conforming parts
- Recording and analysis of the number of units
- Information flow

Note: If material or parts is directly supplied to production stations, the requirements of question 1.7 are also to be considered.

2.3.2 Are products and components appropriately stored and are the transportation means and packaging equipment coordinated with the specific characteristics of the products and components?

Requirements / Explanations

The following must, for example, be considered:

- Inventory
- Protection from damage - parts positioning
- Order, cleanliness, overstocking (storage areas, container)
- Control of storage time
- Environmental influences, air conditioning

Note: If material or parts are directly supplied to the respective production stations, the requirements of questions 1.7 and 1.8 are also to be considered.
13. List of requirements for the process audit Part B

2.3.3 Are rejects, rework, set-up parts and excess material conscientiously separated and identified?

Requirements / Explanations

The following must, for example, be considered:

- Quarantine areas, quarantine storage
- Labeled containers for scrap, rework and set-up parts
- Non-conforming products and non-conforming characteristics
- Release status
- Defined reject and rework stations in production

2.3.4 Is the material and parts flow secured against mixing/confusion and is traceability ensured?

Requirements / Explanations

Considering the product risk, traceability must be ensured over the entire process chain from the supplier to the customer.

The following must, for example, be considered:

- Parts identification
- Identification of production, inspection and use status
- Batch identification
- Expiration dates
- Removal of invalid identifications
- Work documents with parts and production data
13. List of requirements for the process audit Part B

2.3.5 Are tools, facilities, and inspection, test and measuring equipment stored appropriately?

Requirements / Explanations

Tools, facilities, and inspection, test and measuring equipment, which is not in use and not released must be appropriately stored and administered.

The following must, for example, be considered:

- Damage proof storage
- Order and cleanliness (housekeeping)
- Defined storage areas
- Administered issuance
- Environmental influences
- Identification
- Defined release and change status
13. List of requirements for the process audit Part B

2.4 Failure analysis, corrective actions, continuous improvement (CIP)

The supplier has the duty to recognise deviations from the customer requirements using ongoing product and process observations and to eliminate these using suitable actions. Progress towards the zero defect demand of the customer must be made by continuous improvement and using preventive methods in all processes, assisted by statistical techniques. The prerequisite for any improvement is a detailed failure analysis in order to be able to identify the true root causes and to initiate appropriate corrective actions. The effectiveness of corrective actions performed must be proven in each case. Those people and areas responsible for the process must participate in the continuous improvement process and nonconformity elimination. Each of them carries the responsibility for customer satisfaction.

2.4.1 Are quality and process data completely recorded and in such a manner that they can be analysed?

2.4.2 Are quality and process data statistically analysed and are improvement programs introduced from the analysis?

2.4.3 Are the causes analysed and is corrective action initiated in the event of any deviations from product and process requirements?

2.4.4 Is the required corrective action implemented according to the deadlines and is its effectiveness verified?

2.4.5 Are processes and products regularly audited?

2.4.6 Are products and processes continually improved?

2.4.7 Are targets set for the product and process and is their achievement followed up?
13. List of requirements for the process audit Part B

2.4.1 Are quality and process data completely recorded and in such a manner that they can be analysed?

Requirements / Explanations

Quality and process data must be completely available for verification of adherence to requirements. Their potential for analysis must be ensured. Special events must be documented (log book)

The following must, for example, be considered:

- Raw data charts
- Defect concentration charts - control charts
- Data acquisition
- Recording equipment for process parameters (e.g., temperature, time, pressure)
- Equipment down times
- Parameter changes
- Power failure

2.4.2 Are quality and process data statistically analysed and are improvement programs introduced from the analysis?

Requirements / Explanations

Findings and problems must be allocated to the process owner. It is the responsibility of the process owner to define the improvement program and to implement the improvements.

The following must, for example, be considered:

- Process capabilities
- Defect types, defect frequencies
- Defect costs (costs of nonconformity)
- Process parameters
- Scrap, rework
- Hold notes, sorting actions
- Cycle times, throughput times
- Reliability, failure mode
- Function

The following can for example be used:

- SPC
- Pareto analysis
- Cause and effect diagrams
13. List of requirements for the process audit Part B

2.4.3 Are the causes analysed and is corrective action initiated in the event of any deviations from product and process requirements?

Requirements / Explanations

When process or product nonconformities occur, appropriate actions must be taken immediately (e.g., quarantining, sorting, informing) until the effectiveness of performed corrections is verified. This procedure is necessary in order to meet the zero defect requirements.

The following must, for example, be considered:

- Deviations to dimensions, material, functional, and endurance tests
- Cause and effect diagrams
- Taguchi, Shainin
- FMEA, failure analysis
- Process capability analysis
- Quality circles
- 8D method

2.4.4 Is the required corrective action implemented according to the deadlines and is its effectiveness verified?

Requirements / explanations

Corrective actions refer to the entire process chain from the pre-material to the utilisation at the customer. Once corrective actions have been executed, their effectiveness must be verified and must be proven.

The following must, for example, be considered:

- Risk analyses (process FMEA) fault analyses
- Improvement program from audits
- Findings / action from maintenance / service
- Information back to person that caused problem
- Internal / external interface meetings
- Internal complaints
- Customer complaints
- Customer surveys
13. List of requirements for the process audit Part B

2.4.5 Are processes and products regularly audited?

Requirements / Explanations

Audit plans must be available for the product and its manufacturing process. Situations requiring an audit are, for example:

- New projects, new processes, new products
- Non-compliance with quality requirements (internal, external)
- Verification of adherence to quality requirements
- Identification of improvement potential

Nonconformity reports must be passed to the persons responsible and the improvement actions followed up.

The following must, for example, be considered:

- Customer requirements
- Important characteristics
- Function
- Packaging
- Process capability

2.4.6 Are products and processes continually improved?

Requirements / Explanations

The improvement potential must be developed from the present knowledge about quality, cost and service.

The following must, for example, be considered:

- Cost optimization
- Reduction of waste (e.g., scrap and rework)
- Improvement of process stability (analysis of process chain)
- Optimization of set-up times, increase in system availability
- Reduction of throughput times
- Reduction of stock levels
13. List of requirements for the process audit Part B

2.4.7 Are targets set for the product and process and is their achievement followed up?

Requirements / Explanations

Target values must be established, they must be achievable, and it must be ensured that these target values are up-to-date. Required special measures must be defined and converted if necessary.

The following must, for example, be considered:

- Presence and absence of personnel
- Production quantities
- Quality indexes (e.g., error rates, audit results)
- Throughput times
- Non-conformity (non-conformity cost)
- Process indexes (e.g., process capability)
13. List of requirements for the process audit Part B

3. Customer care / customer satisfaction (service)

The customer demands goods free of non-conformities and satisfaction of all requirements for the further processing and use of the product. Included is care (service) after delivery of the product by the supplier in order to recognise deviations from the customer requirements and expectations and to maintain or achieve customer satisfaction through suitable corrective actions. The function of customer care therefore has a key role in the measurement of customer satisfaction. It must be staffed by qualified personnel and have the possibility to bring improvements to all levels and areas of the supplier. The supplier must ensure quick reactions to quality problems and that parts supply is ensured according to the quality requirements. The compliance with the logistical requirements of the customer also contributes to maintaining customer satisfaction. The entire packaging and delivery process (to the customer) must be considered for this purpose. The type and the scope of the packaging as well as the transmission of the logistical data must be defined in specifications between the responsible logistics departments (supplier / customer).

3.1 Are the customer requirements regarding the QM system, product and process complied with?

3.2 Is customer service guaranteed and are complaints recorded and evaluated?

3.3 Are there contingency plans for ongoing supply of parts and immediate actions taken for problems?

3.4 Are all non-conformities analyzed and improvement actions implemented?

3.5 Are the personnel qualified for their individual tasks?

3.6 Is the verification for D/TLD-parts and additional legal requirements evaluated by regular internal audits?

3.7 Does the packaging and the identification of the containers as well as the data exchange (B2B-Platform) comply with the customer requirements?
13. List of requirements for the process audit Part B

3.1 Are the customer requirements regarding the QM system, product and process complied with?

Requirements / Explanations

All requirements especially those that are entered in the supplier evaluation (e.g. delivery, processing and functional quality) of the customer must be considered.

The following must, for example, be considered:
- QM system certification according to VDA 6.1 and/or ISO/TS 16949
- Quality agreements
- Target agreements on zero defect demand
- Dock audits for VW products
- Long term inspection (determination of failure mode)
- Storage/processing/parts availability/distribution
- Functional inspections
- Suitability of inspection and test and measuring equipment
- Comparative inspection processes
- Verification of the specification levels
- Implementation of the requirement Formel Q New Parts Integral (QPN) (including acceptance of the 2 day production)

3.2 Is customer service guaranteed and are complaints recorded and evaluated?

Requirements / Explanations

The professional person responsible for the different organisational areas of the customer must always be available. Customer care is also a measure of product design. The supplier has a duty to observe and if necessary improve products in all product development and usage steps.

The following must, for example, be considered:
- Records of customer visits, if necessary derived actions
- Knowledge about product use
- Knowledge about product problems, transportation complaints
- Conversion of new requirements
- Communication of improvement actions
- Notification of product/process/location changes, also sub-contractors
- Initial / repeated sampling (test, full scale)
- Re-qualification tests
- Information for deviation from requirements also pkg. and trans.
- Quality of the logistical data (e.g. statements regarding container stocks) at the supplier
13. List of requirements for the process audit Part B

3.3 Are there contingency plans for ongoing supply of parts and immediate actions taken for problems?

Requirements / Explanations

Concepts for the assurance of parts supply must already be prepared in the process planning, also in the case of unplanned problems. Applicability must be guaranteed in the full scale phase.

The following must, for example, be considered:

- Emergency plans (e.g. for alternative productions, sub-contractors, packaging, transportation)
- Capacities and reaction times of sorting actions
- Change possibilities in the plant, special operating equipment and tooling
- Use of outside capacities.

3.4 Are all non conformities analysed and improvement actions implemented?

Requirements / Explanations

The following must, for example, be considered:

- Essential in-house analytical/test facilities (laboratory, test facilities, staff)
- Laboratory according to the ISO / IEC 17025 requirements
- PARETO analyses regarding fault characteristics (internal/external)
- Involvement of all the relevant departments (internal/external)
- Application of problem elimination methods (e.g. 8-D report)
- Processing of sampling deviations
- Revision of the specifications
- Check of effectiveness
13. List of requirements for the process audit Part B

3.5 Are the personnel qualified for their individual tasks?

Requirements / Explanations

The following must, for example, be considered by those responsible for:

- Customer care
- Product inspection
- Storage/ transportation
- Logistics
- Non-conformity analysis

Knowledge must be available for example:

- Product / specifications / special customer demands
- Standards / laws
- Processing / function
- Assessment methods (e.g., audits, statistics)
- Quality techniques (e.g., 8D method, cause effect diagram)
- Foreign languages

3.6 Is the verification for D/TLD-parts and additional legal requirements evaluated by regular internal audits?

Requirements / explanations

During the audit / verification for D/TLD all of the important features, including those specified by the Volkswagen Group, must be included.

The legal regulations regarding pollution avoidance are combined in the “List for the declarable substances in the automobile industry – Substances in components and materials” and are to be considered and documented.

3.6 Continued on page 127
13. List of requirements for the process audit Part B

For example, the following must be addressed:

- Audit plan
- Complete execution of the list of requirements
- D/TLD Formel Q capability or comparable
- D/TLD minimum 15 years archiving
- Definition and tracking of the improvement programs
- Involvement of sub-contractors
- Written confirmation of compliance with legal requirements of parts content, etc.
- Information in IMDS complete and current
- VW specifications, for VW 91101 Material list see IMDS (www.mdsystems.com)
- Specifications, Approval documentation for the VW Group

3.7 Does the packaging and the identification of the containers as well as the data exchange (B2B Platform) comply with the customer requirements?

The Volkswagen Group Communication System can be found under: www.vwgroupsupply.com

Requirements / explanations
The following must, for example, be considered:

- Suitability of the packaging, protection
- Technical condition (closing/locking mechanisms) Damages (occupational safety), cleanliness
- Identification according to customer specifications (material card acc. to VDA 4902), plausibility (barcode contents)
- Position of the identification (card pocket, support) Removal of invalid identification
- Transfer of data (e.g.: data transfer acc. to VDA Standard 4927) (acc. to “EDI Implementation Guidelines” Volkswagen AG)
- Released access to the VW Group communication system (B2B Platform)/ VW interface (is the interface known?) / for location (DUNS-Nr.) Supplier information data bank (LDB) maintained?
14. List of Requirements for Mandatory Documentation
D/TLD Parts

1. Technical documentation / verification

Special documents and verification documentation in all of the product and process development phases as well as the series production of the product, are very important for the necessity to submit verification. The supplier must completely list, document and archive all of the quality-related documentation. The supplier must be able to prove that they fulfil all of the customer-specific mandatory documentation for which verification audits are compulsory. The same procedure must be applied to sub-contractors.

The supplier within the scope of their parts is responsible for ensuring that other important features, which they have identified as a result of their experience, are included in the mandatory documentation even if they are not required by the customer.

1.1 Are the technical documents for D/TLD parts available with valid change status, are they identified as D/TLD documents and the D/TLD characteristics specially identified?

1.2 Does the parts manufacturer document those characteristics which are not identified in the VW Group documents as D/TLD characteristics, but which are regarded as safety relevant according to the manufacturer’s product responsibility?

1.3 Is procedure documentation available?

1.4 Does the supplier file the related production and technical inspection documents securely and for at least 15 years?

1.5 Are all important data contained in the documentation?

1.6 Is the archiving performed so that rapid access to individual documents is possible?

1.7 Are the sub-contractors that influence the characteristics for which mandatory documentation is compulsory, obliged to carry out similar verification?

1.8 Are the sub-contractors that influence the characteristics for which mandatory documentation is compulsory, audited and are the requirements verifiably assured?
14. List of Requirements for Mandatory Documentation
D/TLD Parts

1.1 Are the technical documents for D/TLD parts available with valid change status, are they identified as D/TLD documents and the D/TLD characteristics specially identified?

Requirements / Explanations

All the documents (documents and records) with regard to the following are to be considered:
- Delivery components
- Process planning, control

1.2 Does the parts manufacturer document those characteristics which are not identified in the VW Group documents as D/TLD characteristics, but which are regarded as safety relevant according to the manufacturer’s product responsibility?

Requirements / Explanations

The following must, for example, be considered:
- Work material, function, flammability (TL1010), identification of product according to specifications
- Lifetime, reliability, (see also VDA Volume 1 and Volume 6.1 – Element 6).

Remark:
All characteristics from item 1.1 and 1.2 are combined and identified as “mandatory documentation” characteristics
14. List of Requirements for Mandatory Documentation
D/TLD Parts

1.3 Is procedure documentation available?

Requirements / Explanations

Affects all documents with regard to procedures for mandatory documentation parts / products and quality assurance with verification of initial and change releases (see also VDA Band 1 and Band 6.1 Element 6).

1.4 Does the supplier file the related production and technical inspection documents securely and for at least 15 years?

Requirements / Explanations

Modifications to documents must be avoided and documents protected through e.g. microfilming, CD ROM (see also VDA 1). Archiving must be fire and theft proof. Alternatively they could also be copied and placed in a separate archiving room.

The following must, for example, be considered:

- Production plans, process parameter documentation, inspection plans
- Inspection results, capability documentation
- Test and inspection equipment records

1.5 Are all important data contained in the documentation?

Requirements / Explanations

The following must, for example, be considered:

- Part origination data (including change status)
- Inspection characteristics (set / actual values)
- Reliability inspections
- Remarks on deviating results with corrective actions
14. List of Requirements for Mandatory Documentation
D/TLD Parts

1.6 Is the archiving performed so that rapid access to individual documents is possible?

Requirements / Explanations
Archiving must enable allocation to lot / batch No. in the product and inspection documents, throughout the entire manufacturing chain including sub-contractor production.

1.7 Are the sub-contractors that influence the characteristics for which mandatory documentation* is compulsory, obliged to carry out similar verification?

Requirements / Explanations
The following must, for example, be considered:
- Purchase contract
- Quality agreement
- Inspection certificates

1.8 Are the sub-contractors that influence the characteristics for which mandatory documentation* is compulsory, audited and are the requirements verifiably assured?

Requirements / Explanations
For example, proof of the correct documentation for every audit report.

*See remarks to question 1.2
14. List of Requirements for Mandatory Documentation
D/TLD Parts

2. Product and Process

The qualification / capability of the various processes and part tests are decisive when fulfilling the product quality requirements. In this case, verification proofs must be produced. Documentation regarding planning activities, risk analysis, selection and qualification of personnel, proof of quality-capable test routines, test equipment and the environmental-compatibility of the materials and process mediums used must also be included in the verification documentation. It must be guaranteed that parts can be traced back to earlier processes and materials

2.1 Are all important production parameters for the mandatory documentation characteristics established in writing and is their regular inspection documented?

2.2 Has the process capability regarding the mandatory documentation characteristics been proven or is a full inspection performed in the absence of a capability verification?

2.3 Are the inspection procedures for mandatory documentation characteristics suitable to uncover defects?

2.4 Is traceability for mandatory documentation parts guaranteed?

2.5 Are all mandatory documentation characteristics sufficiently taken into consideration/complied with?
14. List of Requirements for Mandatory Documentation D/TLD Parts

2.1 Are all important production parameters for the mandatory documentation* characteristics established in writing and is their regular inspection documented?

Requirements / Explanations

The following must, for example, be considered:
- RPM, loads, pressure, temperature
- Equipment (process) parameters
- Chemistry in fluids

2.2 Has the process capability regarding the mandatory documentation* characteristics been proven or is a full inspection performed in the absence of a capability verification?

Requirements / Explanations

Cpk = 1.33 for production start and continuous improvement, short term process capability Cmk / Ppk = 1.67.

2.3 Are the inspection procedures for mandatory documentation* characteristics suitable to uncover defects?

Requirements / Explanations

The following must, for example, be considered:
- Verification of capability for inspection/measurement systems
- Precision matched to tolerances
- Maintenance, calibration

*See remarks to question 1.2
14. List of Requirements for Mandatory Documentation D/TLD Parts

2.4 Is traceability for mandatory documentation* parts guaranteed?

Requirements / Explanations
The following must, for example, be considered:
- Identification of parts (Group specification VW 105 00)
- Supplier code, identification on parts and sub-assemblies
- Parts source information, production date, batch / lot no.,
- Shipping date, delivery note number

2.5 Are all mandatory documentation* characteristics sufficiently taken into consideration/complied with?

Requirements / Explanations
The following must, for example, be considered:

All mandatory documentation characteristics, also from different product groups

*See remarks to question 1.2
14. List of Requirements for Mandatory Documentation
D/TLD Parts

3. Personnel

A member of the company’s management must have knowledge regarding the current legal requirements (countries where the vehicles of the Volkswagen Group are distributed) in regards to product liability and product safety and demonstrate compliance for their company.

Management and personnel employed for the production and testing of parts and components must be qualified in-line with their special responsibility. The employees must be clearly informed about the risks involved if important product and process features are deviated from. Foreign employees, independent from the hierarchy level, who do not understand the language of the country in which they are a resident, must be qualified and trained in their own mother tongue. Personnel qualifications are to be maintained by continuous training and must be documented in a form of proof of suitability. A pool of suitable qualified personnel must be available so that they are available when bottlenecks occur.

3.1 Are personnel who decide / perform / influence / confirm the mandatory documentation characteristics, trained in their responsibilities?

3.2 Are the associated documents / instructions for foreign personnel, independent of their level, available in an understandable language?

3.3 Is the qualification of management and suitability of personnel proven for their particular task or function?

3.4 Are there sufficient personnel capacities available?
14. List of Requirements for Mandatory Documentation
D/TLD Parts

3.1 Are personnel who decide / perform / influence / confirm the mandatory
documentation* characteristics trained in their responsibilities?

Requirements / Explanations
Personnel must be instructed about the requirement to adhere to laws, effects of
deviation/non-compliance, responsibilities, information flow, quarantining,
identification (required values, reports, confirmation in writing)

3.2 Are the associated documents / instructions for foreign personnel,
independent of their level, available in an understandable language?

Requirements / Explanations
For foreign operators and for example inspectors documents must be normally
in their own language, for management normally in their own language or
English. Alternatively proof of language knowledge (for example language
certificate).

3.3 Is the qualification of management and suitability of personnel proven
for their particular task or function?

Requirements / Explanations
The following must, for example, be considered:
- External qualification of at least one top management person regarding
  the principle of product safety and product liability rules (national, EU,
  USA, Japan) by legal experts (seminars, lawyers, etc.) as well as internal
  knowledge sharing
- External and internal qualification of all personnel responsible for Quality
  and coordinators
- Qualification for process
- Verification through training and random sample checks thereafter

*See remarks to question 1.2
14. List of Requirements for Mandatory Documentation
D/TLD Parts

3.4 Are there sufficient personnel capacities available?

Requirements / Explanations

The following must, for example, be considered:
- Coordination of all activities regarding the mandatory documentation
- Required capacities for operators and inspectors
- Qualified operators as substitutes
15. Requirements Technical Review Suppliers (TRL)

1. Questions

1. Does the supplier have all the current technical documents (drawings, technical delivery requirements, engineering release “BMG release”, first sample test report, packaging requirements) available?

Remark:
Engineering approval (BMG), First sample test report (EMPB), technical documentation (TLD) – characteristics, IMDS input = material data system, access to B2B system, packaging requirements, etc.
Note: Releases are location specific.

2. Is there documentation kept regarding the product/process changes and are all the changes reported to the customer and released by the customer?

Remark:
Release of changes by engineering (BMG) and first sample approval unless authorized via a deviation. This also includes process and system changes (modules and complete assembly groups)
Note: Releases are location specific.

3. Does the supplier document all the characteristics of their product responsibility and also items that are not identified in the technical documents but deemed important by the supplier?

Remark:
The supplier must define additional important characteristics (test criteria, system requirements, documentation of performance) within the scope of their product responsibility beyond customer requirements.

4. During series production does the supplier control through regular checks/control plan (100% testing, sample testing, product audit) the compliance of characteristics and are the results documented?

Remark:
Test characteristics (planned/actual), results of reliability tests, product audit, documentation of various characteristics through plan and actual.
15. Instructions Technical Review Suppliers (TRL)

5. Are the test procedures and test equipment for the checking of characteristics proven suitable and are sufficient capacities available (internal/external)?

Remark:
Proof of measurement capability, contracts with outside laboratory, evaluation certificates.

6. Can the process capability regarding important characteristics be proven and were additional safe guards initiated when items were found not in compliance?

Remark:
During series production Cpk >= 1.33 is required.

7. Has the supplier implemented corrective action for the last improvement program and has the effectiveness of these actions been verified?

Remark:
Requirements from QPN Integral, internal/external process audits, and other customer observations/requests.

8. Does the supplier conduct regular process audits and re-qualification tests and are the customer relevant characteristics included?

Remark:
Internal process audit (each process step), re-qualification tests, controlled through regular plans, testing should be the same as first sample (EMPB) without submission to the customer.

9. Are the suppliers in the added value chain known and quality assured?

Remark:
The Formel Q Capability must be implemented throughout the total manufacturing process, safeguarded through audits and or certification (VDA6.1, ISO/TS 16949 2002)
15. Instructions Technical Review Suppliers (TRL)

10. Do written agreements exist between the supplier and their subcontractors regarding testing of important characteristics and are they controlled?

Remark:
Agreed quality contracts, test method requirements

11. Are the test personnel (operators/inspectors) qualified for the scope of their operations?

Remark:
For specific testing (radiology, crack tests, welding, etc.), are qualification records required, for other tests (operator self-assessment, final inspection) are training and proof of qualification required.

12. Are regular internal audits made for mandatory documentation D/TLD parts?

Remarks:
Planning and realization of D audits, when products with special characteristics are produced that require archiving. A review of the system should be done at least yearly.
Question disregarded if no D parts are manufactured at this location.
15. Instructions Technical Review Suppliers (TRL)

2. Inspection Report

The report is only used for a selected part. Facts or records/documentation of similar parts are not taken into consideration. For the processing of the “Inspection report” the following can be noted:

**Column “Characteristics”**
Record the test characteristics

**Column “D/TLD”**
Mark with an X if applicable

**Column “Cpk values”**
Results of each value

**Column “100% test”**
Mark with an X if checked through 100% testing

**Column “Sample Testing”**
Enter number of parts tested/frequency
For example 3 parts/hr or 5/1000 parts per shift

**Column “Product Audit”**
Enter frequency of audits
For example minimum once per month (consider the total amount produced)

**Column “Reliability”**
Enter frequency of realization, for example minimum once per month (consider the total amount produced)

**Column “Re-qualification”, “Baumuster testing”, “First Sample testing”**
The result should be noted in the box as follows:
“X” “completed”
“E” “required, not yet completed”
“-“ “not applicable”
15. Instructions Technical Review Suppliers (TRL)

3. Visit Announcement
The Technical Review will be announced the day of the realization to the management of the supplier in writing. Notification of the visit is done the day before via fax.

4. Realization
The Technical Review Supplier is not a substitute for a process/product audit
The TRL is oriented towards a product group or a part number. The realization is done through a qualified person from QS Purchased Parts or VW auditors. The problems/shortcomings are to be documented in an improvement program. When serious problems are noted additional safe guards must be agreed upon with the supplier and the receiving factory informed. If necessary, additional activities are initiated according to the escalation principle.

5. Report
After completion of the TRL a report is made at the supplier. For the elimination of problems an improvement program is agreed upon with the management. The timeline for completion of the improvement program must be agreed upon with the responsible person performing the TRL and this must be in writing.
In the column “TREAD Representative” fill in the name for the responsible person for the entire company. In this regard the management of the supplier was informed about the “TREAD Act” legislation in the U.S. by VW Group Purchasing and VW Group Quality Assurance in January 2003 and again in February 2004 in writing.
Attachments

Attachments for Formel Q Capability
A1: Volkswagen Group Forms
A2: Other Documents / relevant information
A3: Figures
A4: Abbreviation
A5: Concepts / Explanation of Symbols
A6: Literature
Attachments

A1: Volkswagen Group Forms

I. Process and Product Audit Report (VA/NB)

- Cover page – Assessment of Quality Capability, QM system audit, Process audit, Product audit
- Remarks
- Overview of Results VDA-QM-System Audit
- Overview of Results Process audit
- Product audit Overview of Results
- Qualification Timing Plan
- Improvement Program
- General Information
- If applicable attachment 1 VDA-QM-System Audit (Summary of Evaluated Questions
- Attachment 2 evaluation matrix level of achievement grade process audit
- Explanation to evaluation matrix level of achievement grade process audit

II. Self-assessment Supplier (Process and Product Audit) (SL)

- Cover page – Self-assessment Supplier (Process and Product audit)
- Result overview self-assessment
- Product audit
- Improvement program
- Attachments: Evaluation matrix Compliance grade Process audit

III. Potential analysis (PN)

- Cover page – Potential analysis
- Overview of results Potential analysis
- Potential analysis New Parts – Requirements catalog (4 pages)

IV. D/TLD Audit / Quality Audit (DV)
(Mandatory Documentation D/TLD Parts)

- Cover page – Quality Audit Mandatory Documentation of D/TLD parts
- Product audit (product quality overview)
- Improvement program
- Attachments: Quality audit Mandatory Documentation D/TLD Parts – Questionnaire for parts which require documentation (2 pages)
Attachments

A1: Volkswagen Group Forms

V. TLD Self-Assessment / Quality Audit (DV SL) (Mandatory Documentation D/TLD Parts)
- Cover page – TLD Self-assessment (Mandatory Documentation D/TLD Parts)
- Product audit (Product quality overview)
- Improvement program
- Attachments: Quality audit Mandatory Documentation D/TLD Parts – Questionnaire for parts which require documentation (2 pages)

VI. Technical Review Supplier (TRL)
- Cover page – Technical Review Supplier
- Question catalog TRL (2 pages)
- Test protocol
- Improvement program

VII. Problem Analysis (PA)
- Cover page – Problem Analysis
- Explanation
- Improvement program

A2: Additional Documents / relevant information

- **Product group catalog** will be available in the B2B system under [www.vwgroupsupply.com](http://www.vwgroupsupply.com)
  Remark: Currently the product catalog is being reviewed and will probably be available electronically towards the middle of 2005 in the B2B system.

- **Supplier self-assessment** will be available in the B2B system under [WWW.vwgroupsupply.com](http://WWW.vwgroupsupply.com) in the future. It can be requested from Forward or Global Sourcing.
Attachments
A3: Figures

Fig. 1: Quality management agreement purchase parts

Fig. 2: VW Excellence

Fig. 3: Supplier evaluation (QF/QL)

Fig. 4.1/4.2: Flow diagram purchase parts inquiry to production approval

Fig. 5: Interfaces and priorities of different audits

Fig. 6: QM system process elements and product quality for the assessment of quality capability

Fig. 7: Flow diagram rating results and follow up activities

Fig. 8: Flow diagram potential analysis

Fig. 9: Flow diagram self-assessment of the quality capability of the supplier

Fig. 10.1/10.2: Flow diagram product audit

Fig. 11.1/11.2: Flow diagram process audit

Fig. 12: Grading scale

Fig. 13: Grading scale questions D/TLD audit

Fig. 14.1/14.2: Flow diagram D/TLD audit

Fig. 15: Flow diagram problem analysis

Fig. 16: Flow diagram Technical Review Supplier (TRL)

Fig. 17: Product development process

Fig. 18: Series production
2TP  2 Day Production Run
8D  8 discipline report for problem solving product
Report problems (comparable to “5 phase” in ISO/TS 16949)
Dept.  Department (organization unit)
B2B  Business to Business (e-commerce system on the internet for
communication between the supplier and the VW Concern)
www.vwgroupsupply.com
BMG  Engineering release
CAD  Computer Aided Design
CAE  Computer Aided Engineering
CAM  Computer Aided Manufacturing (EDV System)
CAQ  Computer Aided Quality (EDV System)
CATIA  CAD system
CMK  Machine capability
CPK  Process capability
CSC  Corporate Sourcing Committee
D/TLD  Mandatory documentation requirement / Technical Process doc.
DB  Data bank
DFU  Data transfer
DV  Order for D/TLD audit
EMPB  First sample report
ESL  European Supplier Link (Sourcing system for VWAG)
EU  European Union
FA  Technical department (for example Manufacturing Line X, QS
Laboratory, Receiving Inspection, Purchasing)
FIFO  First In First Out
FMEA  Failure Mode and Effects Analysis
HDI  Liability association of the German industry
I  Information (in the flow diagram that means the responsible person
will be informed or the process output doc. sent to them)
IMDS  International Material Data System
IO  OK, acceptable
ISQAD  VWAG Data system
JIT  Just In time
KQS  Concern Quality Assurance
KQS4  Concern Quality Assurance Purchasing
KVP  Continuous Improvement Process
KVS  VWAG Data bank for Technical blueprints
LSA  Supplier Self-information
MA  Operator/Employee
Mgmt.  Management
### Attachments

**A4: Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NB</td>
<td>Not applicable (NA) (Will be noted in the audit when the element is not applicable)</td>
</tr>
<tr>
<td>NIO</td>
<td>Not acceptable</td>
</tr>
<tr>
<td>Nolis</td>
<td>Data bank system for VW specifications (also under Norm text online in the B2B system)</td>
</tr>
<tr>
<td>OEM</td>
<td>Original Equipment Manufacturer</td>
</tr>
<tr>
<td>PA</td>
<td>Problem Analysis</td>
</tr>
<tr>
<td>PEP</td>
<td>Product Development Process of the VW Concern</td>
</tr>
<tr>
<td>PN</td>
<td>Potential Analysis</td>
</tr>
<tr>
<td>PPS</td>
<td>Production Planning System</td>
</tr>
<tr>
<td>PRO</td>
<td>CAD system</td>
</tr>
<tr>
<td>Engineer</td>
<td></td>
</tr>
<tr>
<td>PV</td>
<td>Test requirement of VW</td>
</tr>
<tr>
<td>Q</td>
<td>Quality</td>
</tr>
<tr>
<td>QFD</td>
<td>Quality Function Deployment</td>
</tr>
<tr>
<td>QM</td>
<td>Quality Management</td>
</tr>
<tr>
<td>QPN</td>
<td>Qualification Program New Parts</td>
</tr>
<tr>
<td>QS</td>
<td>Quality Assurance (QA)</td>
</tr>
<tr>
<td>QSK</td>
<td>QS purchased parts department of the receiving factory of VW</td>
</tr>
<tr>
<td>QUASI</td>
<td>VWAG Data Bank System</td>
</tr>
<tr>
<td>S</td>
<td>Support (in flow diagram the person that offers support for the process element)</td>
</tr>
<tr>
<td>SA</td>
<td>Self-assessment</td>
</tr>
<tr>
<td>SOP</td>
<td>Start Of Production</td>
</tr>
<tr>
<td>SPC</td>
<td>Statistical Process Control</td>
</tr>
<tr>
<td>Stufe A</td>
<td>Grade level A</td>
</tr>
<tr>
<td>Stufe B</td>
<td>Grade level B</td>
</tr>
<tr>
<td>Stufe C</td>
<td>Grade level C</td>
</tr>
<tr>
<td>TAD</td>
<td>Technical Field Personnel (Employees of the VW Concern)</td>
</tr>
<tr>
<td>TE</td>
<td>Technical Development</td>
</tr>
<tr>
<td>TL</td>
<td>Technical Specification of VWAG</td>
</tr>
<tr>
<td>TLD</td>
<td>“Technische Leitlinie Dokumentation” Technical Guideline Documentation - mandatory documentation</td>
</tr>
<tr>
<td>TLD SA</td>
<td>TLD Self-assessment Supplier</td>
</tr>
<tr>
<td>TREAD</td>
<td>Transportation Recall Enhancement Accountability Documentation</td>
</tr>
<tr>
<td>TRL</td>
<td>Technical Review Supplier</td>
</tr>
<tr>
<td>V</td>
<td>Responsible (in flow diagram, responsible for the process element)</td>
</tr>
<tr>
<td>VA</td>
<td>Process Audit (includes product audit)</td>
</tr>
<tr>
<td>VDA</td>
<td>“Verband Deutscher Automobilindustrie” German Automobile Association</td>
</tr>
<tr>
<td>VP</td>
<td>Improvement program</td>
</tr>
<tr>
<td>VWAG</td>
<td>Volkswagen Group</td>
</tr>
<tr>
<td>VWG</td>
<td>Volkswagen Group identical to VWAG</td>
</tr>
</tbody>
</table>
Abbreviations for Grading

**Part A Product Creation Process (Process audit)**

- $E_{DE}$: Completion score for product development (Design)
- $E_{PE}$: Completion score for process development
- $E_D$: Total completion score for product creation process (Product and Process development)

**Part B Series Production (Process audit)**

- $E_Z$: Completion score sub-contractor/purchased material
- $E_{1-n}$: Completion score production evaluation each process step 1-n
- $E_K$: Completion score customer care/customer satisfaction
- $E_{PG}$: Completion score Production and product groups
- $E_{U1}$: Average completion score for personnel/qualification over all process steps
- $E_{U2}$: Average completion score for machinery/equipment/test facilities over all process steps
- $E_{U3}$: Average completion score for transportation(parts handling/storage/packaging over all process steps
- $E_{U4}$: Average completion score for defect analysis/corrective action/continuous improvement over all process steps
- $E_P$: Total completion score series production each product group (process)

**QM system Evaluation**

- $E_{QMS}$: Completion score QM System evaluation
- $E_X$: Completion score for QM element “X”

All completion scores are to be expressed in percentage points between 0 and 100%
Explanation of concepts / definitions

1st Party Audit
Audit through internal auditors of the organization (supplier)

2nd Party Audit
Audit through the customer (OEM)

3rd Party Audit
Audits through independent certified companies (accredited)

Supplier
The term supplier (first tier) describes the organization that has received a contract from the VW Concern and delivers series (will deliver series) production. In the ISO/TS 16949 standard described as organization.

Sub-contractor
Is the supplier (second tier) to the supplier (first tier), for example supplier n+1 supplies n tier.

1st Tier Supplier
Direct supplier to a receiving factory of the Volkswagen Concern

2nd – n Tier Supplier
Supplier of a direct supplier (1st Tier Supplier) The 2nd – n Tier supplier is therefore a sub-supplier to the Volkswagen Group

VW AG
Volkswagen Group, includes all marks and daughter companies – as well as foreign companies

Auditor VW Group
Qualified QM-Auditor of VW

Direct Safe Guard
The direct safeguard encompasses all improvement actions, which after detection of the problem have been agreed upon with the supplier. The realization must be started immediately, but it is not necessary that it is completed during the Technical Review. For the realization the timeline will be agreed in the improvement program with the supplier.
Remarks:
If during the TRL audit it is seen that the technical requirements of the product or legal requirements are not fulfilled the supplier **must** define a direct safeguard that has to be implemented immediately or in a short time.

Examples Direct Safeguard:
- Blockage and sorting of warehouse inventory
- Additional 100% testing of production
- Immediate assurance of characteristics through an external laboratory

**Mandatory Documentation Characteristics**
Include in addition to the Volkswagen Group noted D/TLD characteristics if applicable, also those characteristics that the supplier notes as safety related and defines them internally as mandatory review items.

**Self-assessment**
This is the process audit in the scope of self-evaluation / self-assessment that the supplier must conduct.

**Technical Review Supplier**
This is a review of the supplier that is announced on short notice to assure that all parts and components comply with all legal and VW Group requirements at all times.

**Volkswagen Excellence**
This is a program for the realization of the Automotive Excellence model within the Volkswagen Group. For detailed explanation see Volkswagen Excellence Model in the preamble.

This is the internet portal in which all VW suppliers after an acceptance procedure can request specific information. The suppliers can obtain the following information through this communication forum:
- VWAG documents (for example Formel Q Capability, Formel Q Concrete, Formel Q Integral)
- Specifications (Online Normentexte)
- Quality performance data (supplier cockpit)
- Sourcing requests (ESL)
- On line catalog, On line negotiation (OVS)
- Electronic capacity management (eCAP)

A consideration for a supplier to obtain contracts can only be done if the supplier’s data bank (LDB) is maintained and current.
**Explanations:**

In this column the responsibilities for particular process steps or decisions will be defined.

R: is responsible for the process step/decision.

S: supports the process step and decision verification.

I: will be informed about the output of the process steps.

Note:

Every process step/every decision must be allocated to a responsible person. There can be only one person responsible for the process. It is also possible to assign a responsible team (e.g. CSC Team).

The person who is signing is not necessarily the executive person. The executive can also be defined under S: e.g.:

R: Supplier Mgmt.

S: Supplier Quality

The fields S: and I: are optional.

**Input**

**Output**

**Flow Chart Symbols**

- **Start**
- **End**
- **Operation**
- **Process**
- **Improvements required?**
- **Interface to data bank/EDV System**

At this location the required documents/aids will be defined, necessary for the conduct of the process steps/decisions to meet the requirements.

At this location the documents/aids will be defined, resulting from process steps/decisions as an output (according to requirements).
Attachments

A6: Literature

Additional Literature

- Formel Q Capability
- Formel Q New Parts Integral
- Formel Q Production material

- VDA Band
  Equally valid are the VDA documents Band 1-7 and 18.
  These can be found under www.vda-qmc.de


DIN EN ISO 9000:2000ff Quality Management System

All above named norms are to be considered in their individual latest version.

Supporting Norms:

DIN ISO 10011-1
Procedure for the audit of Quality Assurance Systems
Audit realization (1992-06)

DIN ISO 10011-2
Instructions for the Audit from the Quality Assurance System
Qualification Criteria for Quality Auditors (1992-06)

DIN ISO 10011-3
Instructions for the Audit from the Quality Assurance System
Management from audit program (1992-06)