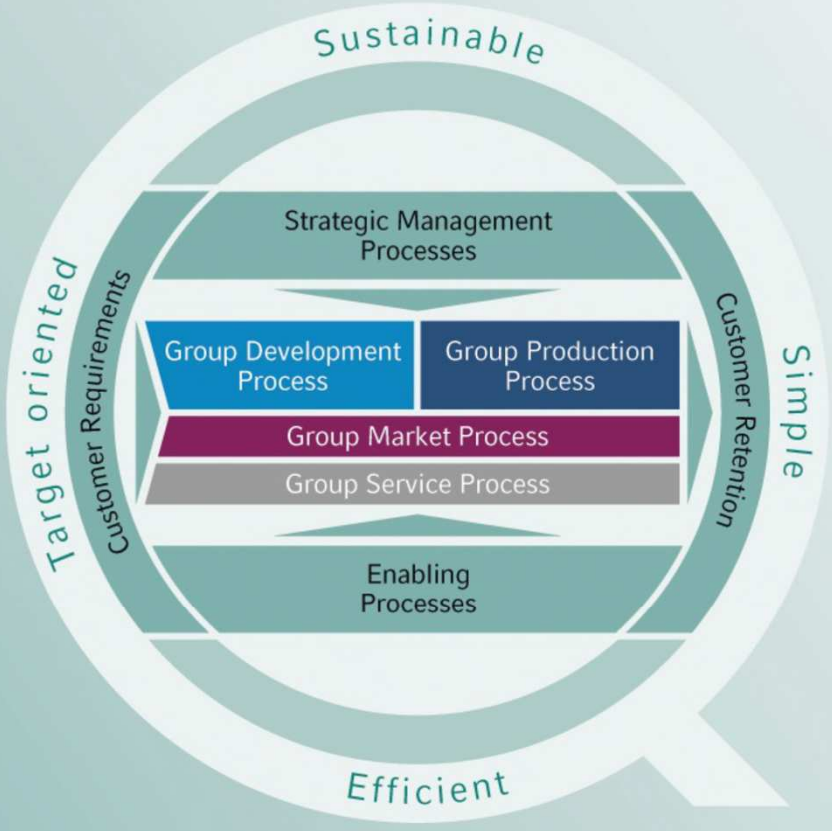
VAILLANT GROUP

QUALITY MANAGEMENT

# SQG – SUPPLIER QUALITY GUIDELINE




Vaillant Saunier Duval awb Bulex DemirDöküm glow worm Hermann Saunier Duval protherm

# Contents





© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

# 1. Introduction

## 1.1 Purpose

Quality and reliability are essential criteria for the position of the VAILLANT GROUP brands within national and international competition. Since the majority of products within the VAILLANT GROUP are assembled using purchased parts, it is necessary to procure our products and services in collaboration with competent, reliable, and quality-oriented partners. The VAILLANT GROUP has, therefore, developed a quality strategy, which forms the basis for a comprehensive state-of-the-art purchasing strategy.

Commitment to this strategy is a prerequisite for long-term business relationships between the VAILLANT GROUP and its suppliers. Mutual benefits enable smooth processes and interfaces between the supplier and the VAILLANT GROUP, and look-ahead strategies enable early error reduction and prevention. When applied consistently, errors are avoided instead of only detected, and a “zero-defect strategy” is implemented.

Both the VAILLANT GROUP and the supplier commit to continuous quality and productivity improvement, ensuring efficiency and maintaining and improving market positions. This is realized by applying the KAIZEN approach and Six Sigma® methods within the supply chain.

This Supplier Quality Guideline (hereinafter “SQG”) is structured in three main chapters comprising:

- General requirements;
- Detailed requirements before the start of production;
- Detailed requirements after the start of production.

## 1.2 Definitions

This SQG describes the VAILLANT GROUP's essential and all-important requirements and expectations regarding quality assurance by its suppliers.

The VAILLANT GROUP is an internationally operating heating, ventilation, and air-conditioning technology group headquartered in Remscheid, Germany. The VAILLANT GROUP comprises the Vaillant GmbH, having its place of business at Berghauser Straße 40, 42859 Remscheid, Germany, and its affiliated companies within the meaning of § 15 AktG [German Stock Companies Act]. The VAILLANT GROUP comprises the following brands:

- Vaillant
- Saunier Duval
- awb
- Bulex
- DemirDökum
- Glow·worm
- Hermann Saunier Duval
- Protherm



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

## 1.3 Scope

This SQG applies to all contractual relationships between companies of the VAILLANT GROUP and its suppliers. It does not affect individual written agreements with the supplier. If the VAILLANT GROUP or a company of the VAILLANT GROUP has entered into separate agreements (e.g., supply agreements or quality assurance agreements) with the supplier in written form that deviates from the present SQG, the provisions of this SQG shall apply in addition and subordinately to written agreements; the provisions of such written agreements therefore prevail.

The SQG defines the requirements and methods for enabling quality assurance. The basic responsibility for all purchased parts lies with the supplier. This SQG targets the complete range of deliveries, including the existence of Quality Assurance Management Systems and the quality monitoring of relevant data from all subcontracted suppliers and service providers. The supplier commits to deliver corresponding proof at any time upon request from the VAILLANT GROUP. Therefore, the SQG is also a requirement for all supplier business relationships with their subcontracted partners.

The VAILLANT GROUP expects the supplier to consequently and responsibly implement all methods and procedures required under this SQG. Within the process audits conducted by the VAILLANT GROUP, conformity to the SQG is periodically reviewed and assured.

## 1.4 Language

In principle, English is the language to be used for all correspondence between the VAILLANT GROUP and the supplier within the scope of this SQG.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

# 2. General Requirements

## 2.1 Quality Management System

**REQUIRED DOCUMENTS**

✓ EN/ISO 9001 certification

The supplier agrees to introduce and maintain a quality management system based on the international ISO 9000 family standards.

The VAILLANT GROUP expects all suppliers to be at least ISO 9001 certified. The supplier must provide evidence of certification at any time, deliver renewal of certifications without special request, and inform the VAILLANT GROUP at least three months in advance if a certification will expire without a planned re-audit. A declaration reinforcing the supplier's predilection to become ISO 9001 certified is mandatory for suppliers that are not certified.

## 2.2 Environmental Protection, Health and Safety

In addition to having a quality management system in place, the VAILLANT GROUP requires the supplier to comply with the respective statutory provisions governing the treatment of employees, environmental protection, health and safety at work, and to work on reducing the adverse effects of its activities on human beings and the environment.

In this respect, the supplier must, within the realm of possibilities, set up and further develop a management system following the DIN ISO 14001 and DIN ISO 45001 standards.

Furthermore, the supplier must comply with the 10 principles of the UN Global Compact Initiative relating to the protection of internal human rights, the right to collective bargaining, the abolition of forced labor and child labor, the elimination of discrimination when personnel is engaged, and employed, the responsibility for the environment, and the prevention of corruption.

Further information on the UN Global Compact Initiative is available at www.unglobalcompact.org

The VAILLANT GROUP conducts social checks to verify the supplier's compliance with the 10 principles of the UN Global Compact Initiative. These social checks consist of a self-assessment and an on-site visit.

## 2.3 ESD protection

The VAILLANT GROUP supplies heating and cooling applications with electronic parts manufactured under ESD (Electro-Static Discharge) protected conditions and takes the necessary ESD protective measures.

All parts and all assemblies containing electronic components, whether in open or closed packaging, are considered ESD sensitive and must be protected according to the IEC 61340 international ESD standards.

Implementing the IEC 61340 international ESD standards is essential for ensuring the quality and reliability of VAILLANT GROUP products.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

Suppliers must take necessary protective measures wherever ESD-sensitive parts are manufactured, transported, processed, tested, or stored to avoid ESD damage to parts, assemblies, and systems at risk from electrostatic charge.

## 2.4 Cybersecurity

Cyberattacks on companies are increasing year by year. The attackers' targets are different and range from stealing/manipulating systems/data through compromising IT/OT systems to completely disabling production. The supplier should take care of cybersecurity to guarantee continuous B2B, ensuring supplies are not compromised/manipulated and confidential data is kept secure.

Cybersecurity or information technology security encompasses techniques for protecting computers, networks, programs, and data from unauthorized access or attacks focused on their exploitation.

It is strongly recommended that the supplier set up an ISMS (Information Security Management System) to tackle the above issues. Several standards apply to IT security. One widely known standard is ISO 27001. This sets out the security requirements for securing IT/OT systems against cyber breaches (e.g., implementation of cybersecurity plan & policies; BCM covering CS risks; performance of regular CS audits and cyberattack simulations on IT/OT systems; deployment & maintenance of CS tools; allocation of IT CS resources; regular training of employees about cybersecurity risks; etc.).

Any form of ISMS certification is recommended (e.g., ISO 27001)

To verify the supplier's compliance with the VAILLANT GROUP supplier cybersecurity requirements, the VAILLANT GROUP may carry out cybersecurity checks consisting of a self-assessment questionnaire and audit form (online and/or onsite).

In case of development activity (hardware or software) at the supplier, the IEC62443-4-1 certification is highly recommended - this part of the IEC62443 Standard framework gives detailed advice on establishing a secure development process

## 2.5 Zero-Defect Strategy

**REQUIRED DOCUMENTS**

- ✓ Zero-defect strategy

The supplier must implement a strategy that leads to a "zero defect" ratio for all parts, assemblies, and modules throughout the supply chain.

To monitor, measure, and evaluate the achieved quality, the supplier must also define internal and external quality targets in line with the VAILLANT GROUP requirements. Concerning these quality targets, the minimum requirements placed by the VAILLANT GROUP are monitoring the internal and external return rate, preferably based on parts per million (ppm), and monitoring the internal and external defect cost.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

## 2.6 Process Audit (Supplier)

Upon request, the supplier must allow the VAILLANT GROUP and/or their representative(s) to check their compliance with the quality assurance measures described in this SQG (see Section 4.2). The supplier must, therefore, after being given prior notice of the date of such an inspection, grant the VAILLANT GROUP and/or their representative(s) reasonable access to their business premises and must, within reason, assist with such an audit. Furthermore, the supplier must grant reasonable access to all quality-related documents, records, data, or other information on the production of the products.

The VAILLANT GROUP has the right to oblige the supplier to fill out a self-assessment questionnaire to prove its compliance with the VAILLANT GROUP requirements concerning the supplier´s quality management system and manufacturing capabilities. The filled-in questionnaire, with provided evidence, is subsequently checked, clarified, and evaluated by the VAILLANT GROUP in cooperation with the supplier`s representative(s) during an online conference call. This represents the first step before a site visit and helps the supplier pass further audit stages.

## 2.7 Qualification of New Supplier

Based on the qualification audit results and the assessment of other supporting documentation, the VAILLANT GROUP evaluates the supplier according to the following rating table. These ratings are key criteria for new supplier approval. A requalification audit is required when the supplier has not delivered for over a year. The VAILLANT GROUP has the right to oblige the supplier to fill in a self-assessment questionnaire to prove its compliance with the VAILLANT GROUP requirements concerning the supplier´s quality management system and manufacturing capabilities.

| Score | Category | Name | Action |
|---|---|---|---|
| 90-100% | A | Qualified | The supplier is qualified and released; an action list is to be followed. |
| 65-89% | B | Conditionally qualified | The supplier is conditionally qualified; a requalification audit is required. |
| 0-64% | C | Unqualified | The supplier is unqualified. |

**According to the table above, the VAILLANT GROUP supplier quality department reserves the right to decide which supplier is qualified or unqualified.**



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

## 2.8 Treatment of Non-Conforming Products

All non-conforming products, which may be detected at:

- Incoming inspection (goods receiving);
- Line reject or end test (production);
- Shipping audit (goods shipping) or other product audits or
- Field reject (customer service);

are managed according to the "treatment of non-conforming products" process, which is presented here in a simplified form.

1. Label and transfer the product to the quarantine area.
2. Check if further parts–including raw materials and semi-finished products–are affected by this failure.
3. Inform responsible persons and determine severity:

| Failure Category | Frequency → / Short description ↓ | Individual case / affects less than 1%) | Affects almost all/ whole lot | Affects whole production / other types as well / repetitive failure |
|---|---|---|---|---|
| C | Minor customer effects | No 8D necessary | No 8D necessary | 8D required |
| B2 | The product is still functional; possible customer service | No 8D necessary | 8D required | 8D required |
| B1 | Product non-functional; insurance case | 8D required | 8D required | 8D required |
| A1 A2 | (In)direct danger to the customer; Norm non-conformity | 8D required | 8D required | 8D required |

4. If required according to the table above, or if internally defined as necessary, initiate the 8D process.
5. Initiate claim management and start material and non-material reimbursement processes.
6. Decide whether a product should be recycled, scrapped, reworked, or returned.

**8D Reporting**

The supplier and the VAILLANT GROUP work within the 8D tool, as provided by the VAILLANT GROUP. The supplier assures the following response times:

- Initial response to 8D report with a definition of short-term actions within one working day;
- Implementation of short-term actions within three working days;
- Definition of long-term actions within 21 days.

The supplier is obliged to use the VAILLANT GROUP 8D Template.

**Claim Management, including Reimbursements**

Regardless of whether an 8D has been raised, the claim management process is initiated if the supplier's poor quality of supplied parts causes a failure, incurs costs, or requires rework. All claims must be constructively answered within 14 calendar days from when the claim was lodged.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

The re-charges for the material (RDO) and non-material reimbursement (RSO) processes are regulated by the conditions of purchase and individual contracts between the supplier and the VAILLANT GROUP.

**Claim-to-Cash (C2C)**
After the affected quantity of defective parts is accepted, the VAILLANT GROUP will send the supplier a corresponding return delivery order (RDO).

The supplier is obliged to send a corresponding credit note to the VAILLANT GROUP.

This credit note must reference the goods complaint message and the return delivery order (RDO).

## 2.9 Evaluation of Supplier

The VAILLANT GROUP performs a supplier evaluation called “Supplier Indicator” every month. This indicator includes monitoring and evaluating failures during production (i.e., line rejects), end-customer product use (i.e., field rejects), and the corresponding supplier response times. Line rejects are measured in parts per million (ppm) and calculated as the ratio of the defective quantity to the amount delivered. The response ratio for claim reports is the percentage of open reports out of the total reports, with the duration measured in days. Based on the analysis of the monitored data, the VAILLANT GROUP decides on further co-operation, projects, necessary supplier audits, and supplier development programs.

## 2.10 Quality Assurance of Sub-Suppliers

**REQUIRED DOCUMENTS**

- ✓ Quality assurance systems of all sub-suppliers

The supplier is expected to ensure that all its sub-suppliers diligently comply with the same regulations under which they operate for the VAILLANT GROUP. The supplier must ensure that:

- Communication is enabled for all information regarding significant characteristics of the installation situation, including drawings and specifications, to sub-suppliers;
- All product-related sub-suppliers maintain quality assurance systems that conform with the quality assurance systems described in this SQG;
- All product-related sub-suppliers comply with the quality norms defined by the VAILLANT GROUP;
- All product-related sub-suppliers continuously improve their manufactured products and their quality management systems;
- Corresponding reviews of conformity, including, where applicable, the required developments concerning the four points above, are managed by the sub-supplier.

Any change regarding product-related sub-suppliers must be reported to the VAILLANT GROUP purchasing department in advance. In all cases, the supplier remains solely responsible for the delivered product, irrespective of the extent to which parts or services are subcontracted to sub-suppliers.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

# 3. Requirements before the Start of Production

## 3.1 Quality Targets, Strategy and Policy

**REQUIRED DOCUMENTS**

✓ Quality targets

The supplier must implement a zero-defect strategy. For this purpose, the VAILLANT GROUP and the supplier will develop a zero-defect strategy along the entire value chain and take all the necessary actions to enable the quality target of zero defects.

The supplier must define internal and external quality targets to measure the achieved quality. All the targets must be aligned with the VAILLANT GROUP. In this context, the following minimum requirements must be fulfilled by the supplier:

- Determination and documentation of the internal and external quota of non-conformities, measured in parts per million (ppm);
- Determination and documentation of the internal and external cost of non-conformities;
- Continuous measurement of the process capability;
- Established a quality management system based on the philosophy of continuous improvement.

## 3.2 Definition of Responsibilities and Contact Persons

**REQUIRED DOCUMENTS**

✓ Responsibilities

The VAILLANT GROUP requires a dedicated contact person to represent the supplier for each project. In the same way, the VAILLANT GROUP provides a dedicated contact person.

A dedicated contact person with defined responsibilities ensures projects are processed efficiently and effectively. As a minimum requirement, the corresponding information for both sides must include the person´s name, function, and respective deputy.

## 3.3 Advanced Product and Quality Planning

Advanced Product & Process Quality Planning (APQP) is one of the key processes for ensuring the reliability and competitiveness of the VAILLANT GROUP's products.

This requires identifying deviations and risks as early as possible to meet all project targets (quality, cost, scheduling).

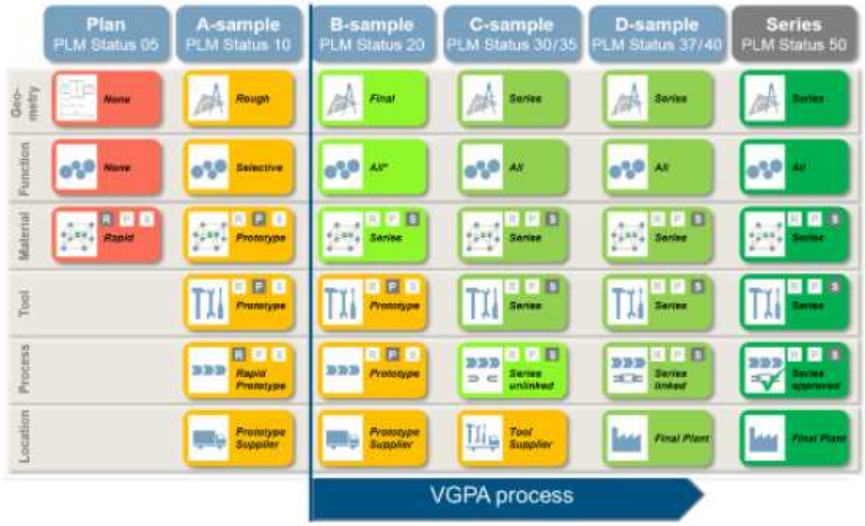
The overall objective is to ensure that product criteria are already capable at the start of production. The supplier, therefore, plays a significant role in safeguarding the quality and reliability of the VAILLANT GROUP products in the field.

A sample maturity model is in place to ensure critical parts are checked already at the prototype stage (B-sample). Depending on tool usage, a C-sample check may also be requested.

Series approval is based on the D-sample check.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.




## 3.4 Management of Customer Requirements

All customer requirements must be identified and implemented.

### 3.4.1 Feasibility Study

**REQUIRED DOCUMENTS**

✓ Feasibility study

In the context of contract review, the supplier must analyze and confirm technical documents (e.g., drawings, specifications, and VAILLANT GROUP plant norms) created by the VAILLANT GROUP.

The analysis, which is seen as a tool for Simultaneous Engineering, contains both a feasibility study of the planned product development project (only applicable to product development suppliers) and an investigation of the economic and actionable producibility (processes, materials, tolerances, components, and characteristics with special procedure for furnishing proof, etc.). The analysis aims to allow the supplier to share their experiences and suggestions to generate mutual benefits.

The tools for the feasibility study include simulation, FEM, case studies, Design of Experiments, etc.

This analysis should include a matching FMEA and MSA.

### 3.4.2 Product and Process Failure Modes and Effects Analysis (FMEA)

**REQUIRED DOCUMENTS**

✓ Design-FMEA
✓ Process-FMEA

The Failure Modes and Effects Analysis (FMEA) is used to investigate and rate possible risks regarding severity, occurrence, and detection.

Potential risks must be minimized through immediate actions. In this regard, the FMEA is an important error prevention tool. It shall consider all phases of the product lifecycle, such as construction, production, assembly, packaging, transportation, and recycling/disposal.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

The FMEA needs to be conducted or revised on the following occasions:

- Development/production of new parts;
- Introduction of new manufacturing processes;
- Location changes;
- Changes to drawings;
- Changes to processes;
- Occurrence of defects.

A schedule must be provided, a responsible person must be named, and a guarantee must be given that all the measures will be implemented before the beginning of series production. The VAILLANT GROUP must be informed about any necessary construction changes for evaluation purposes. This includes maintenance of production-relevant equipment.

**Design-FMEA**
A Design-FMEA must be conducted for all parts constructed under the supplier's responsibility.

**Process-FMEA**
A Process-FMEA must be conducted for all production stages of a part. During this process, the results of the Design-FMEA and the significant characteristics identified by the VAILLANT GROUP need to be carefully considered.

**Implementation of Measures**
Potential risks identified through the FMEA must be mitigated through appropriate measures or actions.

### 3.4.3 Process Flowcharts

**REQUIRED DOCUMENTS**
✓ Process flowcharts

Process flowcharts describe the production flow along the entire value chain, including the arrival of goods (together with transport), all manufacturing steps, warehousing, and shipment. Alternatively, comparable steering elements, like production orders, that fulfill all requirements on process flowcharts can be used.

Process flowcharts reveal influencing variables and are essential facilitators for quality planning. Furthermore, they are the basis for the FMEAs and test plans.

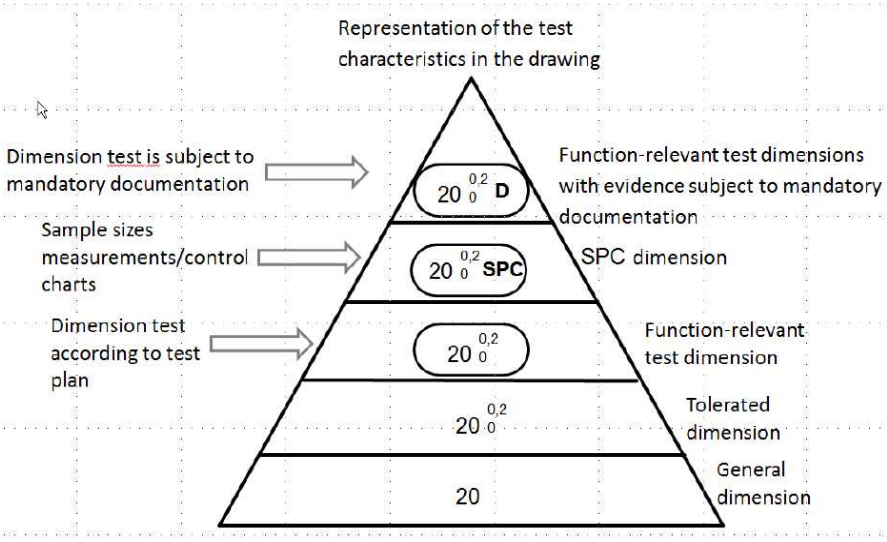
Elements of the process flowchart are:

- Short description of each process step;
- Definition of production/machinery type and/or equipment;
- Short description of controls;
- Specific methods (including statistical ones) used for process control.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

### 3.4.4 Definition of Significant Characteristics




The VAILLANT GROUP drawings will define any significant characteristics, which are informed by the supplier's quality planning and/or risk analysis results (e.g., the production and/or process FMEA). These are highlighted in the VAILLANT GROUP specifications or drawings accordingly.

The supplier commits to implementing a dedicated system for products and characteristics, including a special procedure for furnishing proof. This also holds for significant internal characteristics, i.e., those defined by the supplier, with the implementation of the specification requirements of the VAILLANT GROUP.

The special procedure for furnishing proof needs to be set up so that due diligence can be proven in case of damage (proof of discharge).

### 3.4.5 Control Plan

**REQUIRED DOCUMENTS**

✓ Control plan

The control plan is a planning tool for preventive process control. It is created based on teamwork by systematically analyzing manufacturing, assembly, and control processes. This team should consist of staff members from planning, manufacturing, quality, and other affected departments. Alternatively, comparable steering elements fulfilling all requirements on control plans can be used.

For the creation of control plans, the results from design-FMEA and process-FMEA, experiences from similar processes and products, and the application of improvement methods should be considered.

The control plans must document coordinated and essential product or process control characteristics.

This applies to documented parts (“D”-parts), where all obligatory documentation characteristics must be codified within the control plans.

The procedure for creating a control plan is further detailed in IATF 16949 “Production and service provision” and VDA Volume 3, as defined by the German Association of the Automotive Industry.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

### 3.4.6 Test Measurement Equipment Planning

**REQUIRED DOCUMENTS**

- ✓ Measurement equipment planning

For each measuring or testing step introduced to secure the production quality according to the control plan (see Section 3.4.5), a measuring system analysis (MSA) must be performed. This extends specifically but is not limited to, the controls to secure the compliance of the significant characteristics (see Section 3.4.4). This is also valid for laboratory measurement equipment if the supplier conducts validation or in-process tests for the VAILLANT GROUP.

Information on how to carry out the MSA can be found, amongst others, in the following publications: VDA Volume 5, ISO 10012, ISO 22514-7, and AIAG MSA-4.

The setup of the measurement system analysis (MSA) must include the application of several methods:

**MSA Type-1 Variable Study** – without appraiser's influence

This type of study is usually required as the supplier's first step in measuring system analysis to assess the variation that comes only from the gauge. After the Type-1 Study has passed successfully, it is repeated at the customer’s site after the delivery of parts.

The performance indicators are the gage Cg and Cgk values, where the target is cg/cgk ≥ 1.

**MSA Type-2 Variable Study** – with the appraiser's influence

After the Type-1 Study has been completed successfully, the supplier shall carry out the Type-2 Study to assess the variation of either the new or existing measurement system from the gauge and the appraiser before the final acceptance.

The performance indicator is the gage R&R value, where the target is R&R ≤ 20%.

**MSA Type-3 Variable Study** – without appraiser's influence

The Type-3 Study is a unique form of the Type-2 Study. After the Type-1 Study has been completed successfully, it is used for measurement systems without the appraiser's influence.

The performance indicator is the gage R&R value, where the target is R&R ≤ 20%.

**MSA Attribute Study**

Attribute MSA helps analyze binary results such as PASS/FAIL or visual references such as color to evaluate whether the attribute meets or fails to meet product specifications.

**Control Equipment**

The procurement or creation of control equipment must be completed before the start of the pilot series.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

### 3.4.7 Operating Material Planning

**REQUIRED DOCUMENTS**

- ✓ Process layout
- ✓ Production plan

Facility and operating supply planning includes the planning, procuring, or creating all the required operating supplies needed to manufacture the designated part. The suitability or ability of operating supplies must be proven. For this, suitable documentation must be provided, such as process layout and production plan or supplier-specific planning tools fulfilling the process layout and production plan requirements. Individual proof must be supplied for several differential operating equipment applications.

The supplier must ensure that sufficient operating supplies, both in terms of capacity and quality, are available before the production of the pilot series.

When required by the customer, the supplier must prove within 24 hours, in cooperation with the VAILLANT GROUP, the availability of those operating supplies (Cmk). The proof must follow the corresponding specification or part approval (VGPA).

### 3.4.8 Planning of Preventive Maintenance

**REQUIRED DOCUMENTS**

- ✓ Maintenance plan

The supplier must develop a preventive maintenance system for operating supplies. This means a) that preventive maintenance schedules must be dated and b) that a contingency plan must be created for all processes that may result in an inability to supply in the case of a disruption.

Proof of systematic and consequent conduct regarding all preventive maintenance actions must be provided.

The basis of the preventive maintenance plan may include the recommendations provided by the equipment manufacturer, experience, or SPC analyses.

The scope of the maintenance must also be defined (maintenance manual).

Maintenance staff must be prepared promptly to handle new equipment and systems.

Applying the TPM method ("Total Productive Maintenance") is recommended.

### 3.4.9 Packaging Planning

**REQUIRED DOCUMENTS**

- ✓ Packaging planning including description

Based on the initiative of the supplier, the requirements regarding packaging, transportation mode, and warehousing must be defined and jointly agreed upon between the VAILLANT GROUP and the supplier. These requirements are subsequently laid down in the product specifications. Essential criteria according to standard ISO 14001:2015 are in particular, but not limited to:

- Protection of parts against dirt, contamination, and damage;
- Simple and ergonomic beneficial handling (transportation, discharge);
- Content protection and machine-readable labeling on the outside;
- Reusability (multi-way containers are preferred);
- Avoidance of packaging waste;
- Availability, replenishment;
- Stability and stackability;



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

- Warehousing requirements.

The supplier is responsible for damage-free delivery. Any deviations must be clarified with the VAILLANT GROUP in writing.

The determination of the packaging must be completed before the production of the pilot series.

The documentation is completed within the scope of part approval (VGPA) based on the "Packaging data sheet."

This notwithstanding, the supplier must always adhere to all local legal provisions regarding packaging matters.

### 3.4.10 Staff

**REQUIRED DOCUMENTS**

- ✓ Skills matrix
- ✓ Training plan

**Capacity**

The capacity of qualified staff needs to be planned and implemented so that sufficient human resources are available before the start of production of the pilot series.

**Qualification**

When staff members are assigned to new workstations or translocated to different workstations, they must be (re)trained according to the new conditions. Proof of this must be recorded.

Pre-existing staff qualifications (experience, proven skills, etc.) need to be recorded beforehand to create quantitative and qualitative staff training requirements planning.

### 3.4.11 Process Capability

**REQUIRED DOCUMENTS**

- ✓ Process capability study

The supplier must prove capabilities for all the significant characteristics the VAILLANT GROUP defines. This also holds for internal significant characteristics as defined by specification requirements.

Minimum requirements for capability indices:

- Machine capability index $C_{mk} \geq 1.67$
- Short-term, process capability index $C_{pk} \geq 1.67$
- Long-term, process performance index $P_{pk} \geq 1.33$

**Short-term Process Capability**

A first analysis of the short-term process capability must be presented as soon as at least 50 samples are available. Depending on the project, a smaller sample size can be agreed upon in writing with the VAILLANT GROUP. At the latest, a regular analysis of the SPC recordings (preferably automated) must be conducted at the start of production of the pilot series.

**Long-term Process Capability**

Proof of long-term process capability must be provided as soon as it can be determined according to the abovementioned regulations.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

The short-term process capability must be planned so that all the proof is available before the initial samples are taken.

**Centered Manufacturing**

REQUIRED DOCUMENTS
- ✓ Process capability analysis

For controllable features, centered production should be aimed for. For special features, a controlled and capable process must be maintained and documented by continuous, systematic evaluation of the test results in accordance with the regulations using statistical process control, such as SPC.

Special features that cannot be controlled, such as tool-related features and special features that are not process-capable, require a restriction of the workpiece tolerance, considering all boundary conditions of statistical process control.

For non-processable features, a 100% inspection must be carried out. The supplier must document and evaluate the measured values before delivery or further processing.

### 3.4.12 Initial Sample Testing

REQUIRED DOCUMENTS
- ✓ Initial sample evaluation
- ✓ Approval

Before the first delivery, the initial sample testing (VGPA) must prove that all the agreed quality requirements, as defined in the drawings and specifications, are fulfilled according to the conditions for serial production.

As defined in the applicable drawings and specifications, all quality characteristics must be sampled regarding the measure, material, function, reliability, optics, haptics, and hallmark (e.g., manufacturer´s code). This also applies to the internal characteristics defined in the specification requirements.

**Definition of Initial Sample**

Initial samples are products which have been manufactured and inspected under series production conditions (with regard to machinery, facilities, operating supplies, measuring devices, and staff).

**Storage of Reference Samples**

The supplier must appropriately store reference samples from the initial sampling for at least 10 years.

Reason for initial sampling:

- First-time order of a product;
- Product change;
- Supply disruption for more than one year;
- Supplier switch and, respectively, sub-supplier switch by the supplier;
- Change of production process;
- Deployment of new or changed forming tools (e.g., casting tools, molding tools, punching tools);
- Change of production site or deployment of new or translocated machinery;
- Re-qualification in case of significant non-conforming products (see Section 0.).

Initial samples will be requested by the VAILLANT GROUP with an order and requested delivery date.

The supplier must inform the VAILLANT GROUP in advance and provide initial samples after consulting with the VAILLANT GROUP in the following situations:



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

- Changes to materials or parts incorporated in the products;
- Supply disruption for more than one year;
- Supplier switch and, respectively, sub-supplier switch by the supplier;
- Changes to manufacturing processes;
- modifications made to the methods or facilities for the testing of the products or to other quality assurance measures;
- Deployment of new or changed forming tools (e.g., casting tools, molding tools, punching tools);
- Change of production site or deployment of new or translocated machinery.

Initial samples must be provided together with a completed initial sample test report. During manufacturing with similar tools, an individual test report must be compiled for each tool and mold cavity.

**VGPA submission levels**

Depending on the submission level (1-4), different documents will be requested during the quality planning phase.

**Documentation**

Control results and records must be incorporated in the initial sample test report and provided to the VAILLANT GROUP with the initial samples by the deadline.

Insofar as the documents specified in a Part Approval (VGPA) document are protected by copyright, the companies of the VAILLANT GROUP must be granted a non-exclusive right to use these documents by signing the VGPA document.

These initial samples must be marked as such.

For supplied documents, the supplier shall grant to the VAILLANT GROUP a non-exclusive, cost-free, indefinite, transferable, sub-licensable, irrevocable right to use the technical documentation delivered with the Part Approval (e.g., drawings, specifications, data sheets, etc.) of the product as well as the corresponding intellectual property rights and copyrights for manufacture (including quality assurance, data management, etc.), use and distribution of the VAILLANT GROUP products.

Upon request or by audit, the supplier must provide all relevant certificates and declarations relating to the delivered product (CE, ISO 10204, etc.). In the event the documentation has been produced on behalf of the VAILLANT GROUP and has been paid for, as the case may be, through the costs of the supplied product or based on a development contract, the supplier shall grant the VAILLANT GROUP exclusive and unrestricted rights of use and exploitation. This shall not affect other written agreements between the parties.

Identical numbers must be used within the test report and accompanying the VAILLANT GROUP-approved reference drawings to identify characteristics.

Assemblies manufactured according to the VAILLANT GROUP construction, including all individual parts, must undergo an initial sample test, with the results presented to the VAILLANT GROUP.

The supplier must sample assemblies for products constructed by the supplier himself and present the results to the VAILLANT GROUP. Initial samples must also be taken for individual parts and sub-assemblies if applicable. The VAILLANT GROUP must be granted access to these documents on request.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

The supplier is responsible for sampling inspection activities. However, the VAILLANT GROUP reserves the right to verify the supplier's sampling inspection results.

Further agreements between the supplier and the VAILLANT GROUP can be drawn up that either extend or restrict the aforementioned rules regarding initial sample testing.

**Product and Process Approval**

The initial samples are approved after the sample test results or, where applicable after the supplier process audit results are assessed.

The VAILLANT GROUP will make the approval decision electronically, and the supplier will be informed in text form (e.g., by e-mail).

One of the following decisions will apply:

- Approved: After an order has been issued by the VAILLANT GROUP Purchasing, series production can start.
- Approved under concession: After VAILLANT GROUP Purchasing has issued an order, series production can start. Deviations must be remedied as soon as possible, and new samples and inspection results must be presented to the VAILLANT GROUP.
- Rejected: Deviations must be remedied, and new samples and inspection results must be presented to the VAILLANT GROUP before series production can start.

Sample approval by the VAILLANT GROUP does not release the supplier from their sole responsibility for the quality of their product. Furthermore, sample approval shall not be construed as an order. Therefore, the VAILLANT GROUP's rights and remedies are reserved regarding deviations from specifications that have not been detected before the start of the production process and/or product approval.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

# 4. Requirements after the Start of Production

After the start of production, the VAILLANT GROUP will check and monitor the fulfillment of all the agreed requirements monthly and quarterly, as described in Section 2.9. If deviations are found in a supplied part, the VAILLANT GROUP's non-conforming products process must be applied, and, if necessary, a process audit must be conducted.

## 4.1 Determination of Serial Process Capability

**REQUIRED DOCUMENTS**

- ✓ Process capability report

According to Section 0., a process capability report must be provided upon request from the VAILLANT GROUP, especially within a process audit. Furthermore, the requirements regarding a centered production approach must be fulfilled.

For the determination of process capability, the process must operate under statistical control, i.e., all systematic influences must be known and under control. In general, process capability is determined based on control charts.

## 4.2 Process Audits

**REQUIRED DOCUMENTS**

- ✓ Audit result
- ✓ Action list

The supplier must conduct and document internal process audits determined by DIN EN ISO 9001. In case of deviations, this documentation must be provided to the VAILLANT GROUP upon request. Process audits support continuous collaborative product development and optimization.

The VAILLANT GROUP conducts process audits if one or more of the following events occur:

- Product change;
- Material change;
- Process change;
- Production capacity change;
- Significant characteristics must be ensured;
- Change of quality level based on documented deficiency;
- Results of sub-supplier audits.

The extent of the audit is based on the Quality Management Standard VDA 6.3, as defined by the German Association of the Automotive Industry.

Having conducted the audit, all detected deviations must be processed in an effective containment action program with a corresponding schedule. The implementation of these containment actions must be tracked, the effectiveness of the changes checked, and the realization thereof documented.

The VAILLANT GROUP evaluates each supplier based on the following rating table.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

| Score | Category | Name | Action |
|---|---|---|---|
| 90-100% | A | Capable | Improvement actions |
| 75-89% | B | Conditionally capable | Corrective actions and re-audit required |
| 0-74% | C | Incapable | Escalation with reconsider-ation of further business cooperation |

## 4.3 Product Audit

The supplier must conduct a product audit according to VDA 6.5. The control plan must specify that a product audit will be performed at least twice a year, usually following longer production halts, such as holiday shutdowns, for each product produced as a series production part.

## 4.4 Measurement System for Significant Characteristics & Calibration

**REQUIRED DOCUMENTS**
✓ Capability indicators

As stipulated in Section 0, an efficient measurement system must be implemented to control the significant characteristics (refer to Section 3.4.4). The measurement system's monitoring and calibration are integrated into, e.g., the maintenance system. This means that capability performance indicators must be archived and, if requested, provided to the VAILLANT GROUP.

## 4.5 Reliability Checks

**REQUIRED DOCUMENTS**
✓ Evidence

Conducting reliability checks is a mandatory requirement as specified in the control plan (refer to Section 0.). Documented evidence of the reliability checks must be archived to provide it to the VAILLANT GROUP upon request.

## 4.6 Documentation and Archiving of Quality Data

**REQUIRED DOCUMENTS**
✓ Document management system

The supplier must archive all resulting quality data, including but not limited to data from control cards, inspections, tests, FMEA, audits, and regulations on dimensional checks, calibration, and failure containment, for at least 10 years.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

## 4.7 Change Management

The supplier must give the VAILLANT GROUP advance written notice of any changes to their manufacturing process, materials or parts incorporated in their products, any changes in the design of the products, of the relocation of production plants, of their sub-suppliers, or any modifications made to the methods or facilities for the testing of the products, or any other quality assurance measures. The supplier must give the VAILLANT GROUP sufficient time to check whether such changes may have a detrimental effect. The supplier must report all changes to the VAILLANT GROUP, including all corresponding performed measurements. In all cases, the VAILLANT GROUP will evaluate the changes. Any modifications of the products regarding agreed quality requirements (as defined in the drawings and specifications) require the prior written confirmation of the VAILLANT GROUP on the VGPA.

## 4.8 Traceability

The supplier must ensure, whether by identification of the products or, if such is impossible or impractical, by other suitable means, that, in case defects are detected in a product, they can immediately establish which other products might be affected. The VAILLANT GROUP shall not be obliged to accept products that are not adequately marked or without an adequate substitute form of identification. It is entitled to return them to the supplier at its expense.

Tracing must ensure clear and gapless tracking from delivery data back to the designated workstation to the sub-supplier level.

The correct position for the means of identification of the product will be laid down in the specifications.

For tracing important components, the VAILLANT GROUP´s VN 208 standard (on trading goods) outlines the requirements for machine-readable optical labels and provides corresponding information.

For the traceability of parts within the production process, the supplier must refer to the VAILLANT GROUP´s VN 209 standard, which the company will provide upon request.

All non-conforming products, semi-finished parts, and finished parts or products must be marked and stored clearly without ambiguity so that no confusion is generated and mixing with conforming products is eliminated.

To this end, color coding, bar coding, and marker tags or stamps are considered appropriate tools.

Suitable procedural actions must be established for parts where a possible mix-up can only be detected using measuring techniques. If such actions are not available, additional eye-catching labeling must be used.

D-parts and essential parts must be identified within the production process within mixed production systems. The corresponding containers and accompanying documents must be marked clearly with the capital letter “D.”



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

All steps must be arranged so defective parts can be localized within the smallest possible area, even after a longer time.

The supply chain and corresponding quality data for all parts containing characteristics with a mandatory documentation requirement must be traceable. This applies to the value chain at all levels of subcontracted partners. Traceability must manifest across all relevant levels in an appropriate system so that all the necessary corresponding information can be provided within 24 hours to the VAILLANT GROUP if requested.

As a minimum requirement, all parts must contain information on the batch number, production date, and other identification numbers. Machine-readable and electronic solutions are preferred and strongly recommended. The different types of batches are given below:

- Raw material batches;
- Delivery batches;
- Production batches.

The supplier must define and operate their disturbance management system.



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

Overview of Revisions

| Version | Date of Modification | Revised by | Released by | Change | Affected Sections |
|---|---|---|---|---|---|
| 2012 | 2012-07-27 | Bernhard Pollul | Karsten Wetekam | First release of the document | - |
| 2013 | 2013-08-28 | Karsten Wetekam, Bernhard Pollul | Karsten Wetekam | General corrections and updates | 1.1.-1.3., 2.1., 2.4., 2.6., 3.4., 4.3.-4.5., 4.7., 4.8. |
| 2015 | 2015-11-20 | Armin Michnik, Bernhard Pollul | Karsten Wetekam | Updates of VAILLANT GROUP standards | 2.2., 2.6., 2.8., 3.4., 4.2., 4.8. |
| 2016 | 2016-09-22 | Armin Michnik, Tomas Urminsky, Bernhard Pollul | Karsten Wetekam | Update of DIN EN ISO9001 standard | 2.1., 2.3, 2.4., 2.6., 3.4., 4.2., 4.3., 4.5.-4.8. |
| 2018 | 2018-07-12 | Lenka Faturova | Anton Dobias | Updates of VAILLANT GROUP standards | 2.4.-2.6., 3.4.4, 3.4.9., 4.2., 4.8. |
| 2019 | 2019-06-05 | Stano Michal<br>Dobias Anton | Anton Dobias | Update according to VAILLANT Group Standards | 2.2, 3.4.12 |
| 2022 | 2021-08-12 | Vanessa Baumes<br>Miloslav Prekop<br>Christophe Termeau<br>Tomas Tichy<br>Michal Stano<br>Ralf Stamm | Anton Dobias | General corrections and updates. Adding new chapters ESD, CS | 2.2; 2.3; 2.4; 2.6; 2.7; 3.3; 3.4.12 |
| 2025 | 2024-11-13 | Vojtech Kriak<br>Andrej Lahučký<br>Tomáš Hedervári<br>Juergen Woszidlo<br>Christophe Kersaho | Esen Yucel | General corrections and updates.<br><br>Changed audit scoring and 8D reporting response times.<br><br>Changed content of MSA studies, a new definition of product audit. | 1.1; 1.3; 1.4; 2.1; 2.3; 2.5; 3.1; 3.2; 3.3; 3.4.1; 3.4.2; 3.4.5; 3.4.8; 3.4.11; 3.4.12; 4.6; 4.8<br><br>2.7+4.2; 2.8<br><br>3.4.6; 4.3 |



© 2025 Vaillant GmbH, Remscheid, Germany. All rights reserved.

TAKING CARE
OF A BETTER CLIMATE

INSIDE EACH HOME
AND THE WORLD AROUND IT

© 2025
SQG – Supplier Quality Guideline

All rights reserved

Vaillant GmbH
Berghauser Straße 40
42859 Remscheid
Germany