VAILLANT GROUP

QUALITY MANAGEMENT

SQG - Supplier Quality Guideline 2019

Vaillant | Saunier Duval | awb | Bulex | DemirDöküm | Glow-worm | Hermann Saunier Duval | protherm

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1. Introduction

1.1. Purpose

Quality and reliability are both essential criteria for the position of the VAILLANT GROUP brands in the national and international competition. Since a major part of products within the VAILLANT GROUP is assembled using purchased parts, it is necessary to procure the products and services in collaboration with competent, reliable, and quality-oriented partners. Therefore, the VAILLANT GROUP has 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 with mutual benefits enabling smooth processes and interfaces between the supplier and the VAILLANT GROUP as well as look-ahead strategies enabling early error reduction and prevention. When applied consequently, errors are avoided instead of only detected and a “zero defect strategy” is implemented.

Both the VAILLANT GROUP and the supplier commit to the principle of continuous improvement of quality and productivity ensuring efficiency, maintenance, and improvement of market positions. This is especially realized by using the KAIZEN approach and Six Sigma® methods within the entire supply chain.

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

- general requirements
- detailed requirements before start of production
- detailed requirements after start of production

1.2. Definitions

This SQG describes the essential and indispensible requirements and expectations of the VAILLANT GROUP with respect to quality assurance by its suppliers.

The VAILLANT GROUP is an internationally operating heating, ventilation, and air-conditioning technology group with headquarters 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

1.3. Scope

This SQG shall be applicable to all contractual relationships between companies of the VAILLANT GROUP and its suppliers. It does not affect individual written agreements with the supplier. In the event that 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 are deviating from the present SQG, the provisions of this SQG shall apply in addition and subordinately to written agreements; the provisions of such written agreements shall prevail.

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

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

1.4. Language

The language to be used for all correspondence between VAILLANT GROUP and the supplier within the scope of this SQG shall be English in principle. Translations of the SQG are, however, available for convenience purposes.

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 Standards ISO 9000 ff.

The VAILLANT GROUP expects at least an ISO 9001 certification of all suppliers. The supplier has to 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 planned re-audit. For suppliers that are not certified, a declaration reinforcing the supplier's disposition to aim for ISO 9001 certification is mandatory.

2.2. Environmental Protection, Health, and Safety

The supplier shall comply with the respective statutory provisions governing the treatment of employees, environmental protection, and health and safety at work. Furthermore the supplier shall work on reducing the adverse effects of its activities on human beings and the environment. In this context, the supplier has to set up the basics of ISO 14001 as well as OHSAS 18001 into his Quality Management System, which has to be continuously improved within the bounds of possibility. Additional to this supplier needs to prove the Declaration of Conformity as a special document which the manufacturer signs to say that the product meets all of the Vaillant Group requirements if applicable. Certificates needs to be shown during audits to Vaillant Group representatives. In addition to that, the supplier shall comply with the principles of the UN Global Compact Initiative relating to the basic protection of international human rights, the right to collective bargaining, the abolition of forced labour and child labour, enforcement of anti-discrimination within the workforce, responsibility for environmental protection, as well as the prevention of corruption. For further information on the UN Global Compact Initiative, please refer to http://www.unglobalcompact.org.

Regarding environmental protection, it is expected from the supplier to implement environmentally friendly supply chain processes with limited resource consumption. The latter includes the implementation of internal and external structures enabling the recycling of products at the end of their product lifecycles.

In any case, the supplier is obliged to comply with all applicable laws regarding environmental matters.

2.3. Zero-Defect Strategy

REQUIRED DOCUMENTS

✓ Zero-Defect Strategy

The supplier has to implement a strategy leading to a "zero defect" ratio for all parts, assemblies, and modules along the complete supply chain.

In order to monitor, measure, and evaluate the achieved quality, the supplier also has to define internal and external quality targets in a joint-effort

with the VAILLANT GROUP. Concerning these quality targets, minimum requirements requested by the VAILLANT GROUP are monitoring of both internal and external return rate, preferably based on parts per million (ppm), as well as monitoring of internal and external defect cost.

2.4. Process Audit (Supplier)

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

2.5. Evaluation of Supplier Capability

Based on the results of the certification audit as well as process & product audit, the VAILLANT GROUP evaluates each supplier based on the following rating table. These ratings are a key criteria for new supplier approval. When supplier is not delivered for more than one year requalification audit is needed.

Score	Name	Action
80-100%	Capable	Supplier is qualified and released, action list to be followed.
51-79%	Limited capability of supplier	Supplier is not released/limited capability, re-audit needed.
0-50%	Not capable supplier	Supplier is not qualified.

VG supplier quality department after common agreement with IP reserve the right to decide about qualified/not qualified of supplier out of table above.

2.6. 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 by the "treatment of non-conforming products" process, which is here given in a simplified way:

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

Failure Category	Frequency → / Short description ↓	Individual case / affected less than 1 %)	Affect almost / whole lot	Affect whole production / other types as well / repetitive failure
C	Minor customer effects	No 8D necessary	No 8D necessary	8D required
B2	Product still in function; possible customer service	No 8D necessary	8D required	8D required
B1	No function of product. Insurance case	8D required	8D required	8D required
A1 A2	(In)direct danger for customer, Norm nonconformity	8D required	8D required	8D required

4. If required by the table above, or if internally defined as necessary, initiate 8D process.
5. Initiate Claim Management and start material and non-material reimbursement processes.
6. Decide on recycling, scrapping, reworking, or returning of product.

8D Reporting

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

- Initial response to 8D report within one working day
- Finalization of immediate actions within 3 working days
- Finalization of long-term actions within 21 days

The supplier is obliged to use Vaillant Group described 8D Template.

Claim Management including Reimbursements

Regardless whether an 8D has been raised, the claim management process is started if bad quality of supplied parts causes a failure, cost, or a rework by the supplier. All claims have to be constructively answered within 14 calendar days since claim is announced.

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 acceptance of affected quantity of defect parts the VAILLANT GROUP will send a corresponding return delivery order (RDO) to the supplier.

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

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

2.7. Evaluation of Suppliers

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

In addition to the monthly reporting, the top-80-suppliers are measured quarterly in the disciplines quality, supply chain, purchasing, and cooperation within projects. The corresponding results are displayed as percentage values. Based on that, a classification into class-A, class-B, and class-C suppliers is carried-out for each supplier. The corresponding results are the base for further cooperation and may also result in corrective actions.

2.8. Quality Assurance of Sub-Suppliers

REQUIRED DOCUMENTS

- ✓ Quality Assurance Systems of all sub-suppliers

It is expected that the supplier ensures compliance with the same diligence and regulations under which he operates for the VAILLANT GROUP from all its sub-suppliers. In particular, the supplier has to ensure that:

- communication is enabled for all information regarding significant characteristics of the installation situation, as well as drawings and specifications to sub-suppliers,
- all product-related sub-suppliers shall maintain quality assurance systems which are conform with the quality assurance systems described in this SQG,
- all product-related sub-suppliers have to comply with the quality norms defined by the VAILLANT GROUP,
- all product-related sub-suppliers continuously improve their manufactured products and their quality management system.
- corresponding reviews of conformity as well as –if applicable- required developments fulfilling the four topics mentioned above have to managed by the supplier.

Any change of product-related sub-suppliers has to be reported to the VAILLANT GROUP purchasing department in advance. In any case, the supplier solely remains responsible for the delivered product, irrespective of the extent of parts or services subcontracted to sub-suppliers.

3. Requirements before Start of Production

3.1. Quality Targets, Strategy, and Policy

REQUIRED DOCUMENTS

✓ Quality Targets

A zero-defect strategy has to be implemented by the supplier. For that purpose, the VAILLANT GROUP and the supplier develop a zero-defect strategy along the entire value chain and take all necessary actions to enable the quality target of zero defects.

For measuring the achieved quality, the supplier has to define internal and external quality targets. All targets have to be aligned with the VAILLANT GROUP. In this context, the following minimum requirements have to 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 quality management system based on the philosophy of continuous improvement

3.2. Definition of Responsibilities and Contact Persons

REQUIRED DOCUMENTS

✓ Responsibles

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.

Definition of responsibilities and contact persons aim at an efficiently and effectively processed project. As a minimal requirement, the corresponding information on both sides must include name, function, and deputy arrangement.

3.3. Advanced Product and Quality Planning

REQUIRED DOCUMENTS

✓ Project Flowchart

In order to cope with ongoing market requirements of faster development times for new products, it is recommended to apply a standard procedure along specified quality gates as outlined in the graphic below:

Supplier scheduling should be orientated on the applicable project milestones. Thereby, in the interest of a simultaneous engineering process, it is also expected by the supplier to “constructively” support the continuous improvement of those milestones. If applicable, suppliers will be involved in advanced development of the specification book before its final definition. In this case, it is expected by each supplier to provide an individual project plan which is continuously coordinated with the VAILLANT GROUP representative and adapted if necessary.

3.4. Management of Customer Requirements

All customer requirements need to be identified and implemented.

3.4.1. Feasibility Study

REQUIRED DOCUMENTS
- ✓ Feasibility Study

In the context of contract review, technical documents (e.g., drawings, specifications, VAILLANT plant norms) created by the VAILLANT GROUP need to be analysed and confirmed by the supplier.

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, parts, and characteristics with special procedure of furnishing proof etc.). Goal of the analysis is to give the supplier opportunity to share his experiences and suggestions for the sake of mutual benefits.

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

This analysis should cover a matching with 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 to be used for the investigation and assessment of possible risks regarding severity rating, occurrence rating, and detection rating.

Potential risks are to be minimised through urgent measures. Hereby, the FMEA is an important error prevention tool and needs to consider all phases of the product lifecycle such as construction, production, assembly, packaging, transportation, as well as recycling/disposal.

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

- Development/production of new parts
- Introduction of new manufacturing processes
- Location shifting
- Change of drawings
- Change of processes
- Occurrence of flaws

For the implementation of any measures taken, a schedule needs to be provided, a responsible person to be named, and ensured that all measures are processed before beginning of series production. For evaluation purpose, The VAILLANT GROUP is to be informed in advance about necessary construction changes. This includes maintenance of production-relevant equipment.

Design-FMEA
A Design-FMEA is to be conducted for all parts which are being constructed under the responsibility of the supplier.

Process-FMEA
A Process-FMEA is to be conducted for all production stages of a part. In the course of this, the results of the Design-FMEA and the "significant characteristics" named by the VAILLANT GROUP need to be considered particularly.
Implementation of Measures
Potential risks which are identified by the FMEA need to be minimised by appropriate measures/actions.

3.4.3. Process Flowcharts

REQUIRED DOCUMENTS
✓ Process Flowcharts

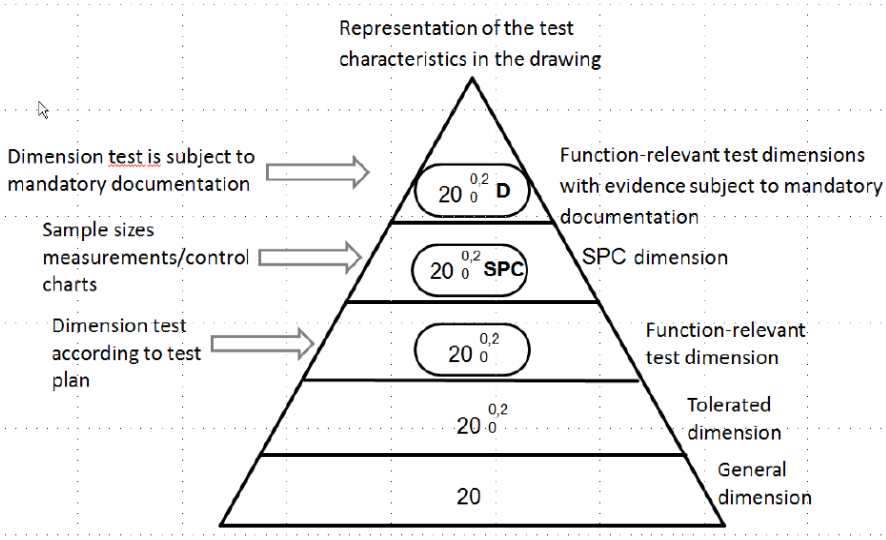
Process flowcharts describe the production flow along the entire value chain including the arrival of goods (together with transport), all manufacturing steps, warehousing, and shipment of goods. Alternatively, comparable steering elements like production orders fulfilling all requirements on process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

Process flowcharts reveal influencing variables and, therefore, are important facilitators for quality planning. Moreover, 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) which are used for process control

3.4.4. Definition of Significant characteristics



Any significant characteristics will be defined by the VAILLANT GROUP drawings, as a result from quality planning, and/or result from the risk analysis conducted by the supplier, e.g., the production and/or process FMEA. They are highlighted in the VAILLANT GROUP specifications or drawings.

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

The special procedure of furnishing proof needs to be laid out in such a way that, in the event of damage, due diligence can be proofed (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 by teamwork through systematic analysis of manufacturing, assembly, and control processes. This team should consist of staff members from planning, manufacturing, quality, as well as other affected departments. Alternatively, comparable steering elements fulfilling all requirements on control plans can be used.

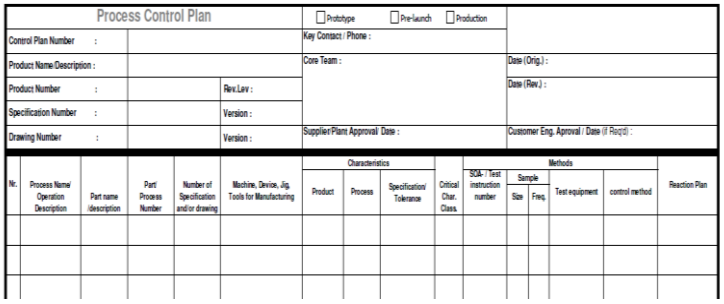
For the creation of control plans, the results from Design-FMEA, Process-FMEA, experiences from similar processes and products, as well as application of improvement methods should be considered.

Coordinated as well as important product or process control characteristics need to be documented in the control plans.

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

Furthermore, the control plan needs to be created for all production steps and must at least contain the elements outlined on the “Control Plan” form (refer to VAILLANT purchasing internet page).

A further detailed description of the procedure for the creation of a control plan is outlined within the QS 9000-document “Advanced Product Quality Planning and Control Pan (APQP) and in VDA Volume 3, defined by the German Association of the Automotive Industry.



Process Control Plan					☐ Prototype ☐ Pre-launch ☐ Production										
Control Plan Number :					Key Contact / Phone :										
Product Name/Description :					Core Team :								Date (Orig.) :		
Product Number :			Rev.Lev :										Date (Rev.) :		
Specification Number :			Version :												
Drawing Number :			Version :		Supplier Plant Approval Date :								Customer Eng. Aproval / Date (if Reqd) :		

Nr.	Process Name/ Operation Description	Part name /description	Part/ Process Number	Number of Specification and/or drawing	Machine, Device, Jig, Tools for Manufacturing	Characteristics			Critical Char. Class.	Methods					Reaction Plan
						Product	Process	Specification/ Tolerance		SOA- / Test instruction number	Sample		Test equipment	control method	
											Size	Freq.			

3.4.6. Test Measurement Equipment Planning

REQUIRED DOCUMENTS

- ✓ Measurement Equipment Planning

For all measurement equipment, a measurement system analysis needs to be performed. Hereby, resolution, tolerance, and the entire measuring process of the to-be-measured-characteristic have to be taken into account. This is also valid for laboratory measurement equipment if the supplier conducts validating tests for the VAILLANT GROUP.

The measurement system analysis is outlined within the DIN EN 9001, DIN EN ISO 10012, QS9000, as well as in VDA Volume 5, defined by the German Association of the Automotive Industry.

For setting-up the measurement system analysis (MSA), several methods have to be performed:

MSA Type-1 Study (Method 1) – with influence of worker(s)

This type of study is usually, as a first step, carried out at the supplier of the measurement device or system in order to evaluate new or modified measurement systems prior to their first use. A capability index is then calculated to determine the suitability of the system. After the Type-1 Study is passed successfully, it has to be repeated at the customers' site after delivery.

The performance indicator is the cg and cgk value, where target is cg/ cgk ≥ 1.

MSA Type-2 Study (Method 2) – without influence of worker(s)

After Method 1 has passed successful, the Type-2 study is carried out at the customer's plant at the system's intended point of use in order to evaluate new and existing measurement systems prior to final acceptance. The evaluation is based on a statistic called %R&R. MSA.

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

MSA Type-3 Study (Method 3)

The Type-3 study is a special case of the Type-2 study. After Method 1 has passed successful it is used for measurement systems without appraiser influence. The evaluation of this measurement procedure is based on the %R&R statistic.

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

Control Equipment

The procurement or creation of control equipment needs to be completed prior to the start of the pilot series.

3.4.7. Operating Material Planning

REQUIRED DOCUMENTS

- ✓ Process layout
- ✓ Production plan

Planning of facility and operating supplies includes planning, procurement, or creation of all required operating supplies that are needed to manufacture the designated part. The suitability or ability of operating supplies must be proved. For this, suitable documentation such as process layout and production plan or supplier specific planning tools fulfilling the requirements process layout and production plan, has to be provided. In

case of several differential operating equipment applications, individual proof has to be supplied for each single use.

It is required by the supplier that sufficient operating supplies in terms of capacity and quality are available before start of the pilot series.

When required by the customer, the ability of those operating supplies (C_{mk}) has to be proven within 24 hours by the supplier in cooperation with the VAILLANT GROUP. The proof has to be carried-out according to the corresponding specification or the part approval (VGPA).

3.4.8. Planning of Preventive Maintenance

REQUIRED DOCUMENTS

- ✓ Maintenance Plan

Suppliers are obligated to develop a system of preventive maintenance of operating supplies. This means a) that preventive maintenance schedules need to be dated and b) that a contingency plan needs to be created for all processes that would result in an inability to supply in the case of a disruption.

Proof of systematic and consequent conduct of all preventive maintenance actions has to be provided.

The basis of this preventive maintenance plan could, for example, comprise recommendations outlined by the equipment producer, experience, or SPC analyses.

The maintenance scope also has to be defined (maintenance manual).

Maintenance staff has to be prepared timely for new equipment and systems.

The application of the TPM method ("Total Productive Maintenance") is recommended.

3.4.9. Packaging Planning

Based on the initiative of the supplier the requirements regarding packaging, transportation mode, and warehousing are to be defined and jointly agreed upon between the VAILLANT GROUP and the supplier. Following that, these requirements will be laid down in the specification of the product. Essential criteria according to standard ISO 14 001:2015 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 labelling on the outside
- Reusability (multi-way containers are to be preferred)
- Avoidance of packaging waste
- Availability, replenishment
- Stability and stackability
- warehousing requirements

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

Definition of packaging has to be completed before beginning of the pilot series.

Initial documentation is documented within the part approval (VGPA).

Nevertheless, the supplier also has to adhere to all local legal provisions regarding packaging matters.

3.4.10. Staff

REQUIRED DOCUMENTS

- ✓ Skill matrix
- ✓ Training plan

Capacity

The capacity of qualified staff needs to be planned and carried out in such a way that sufficient human resources are available before start of the pilot series.

Qualification

Every staff member has to be trained along with the creation of a new workstation or translocation to a different workstation as per new conditions. Proof of that needs to be recorded.

For the creation of a quantitative and qualitative staff training requirements planning, pre-existing staff qualifications (experiences, proved skills etc.) need to be recorded beforehand.

3.4.11. Process Capability

REQUIRED DOCUMENTS

- ✓ Process Capability Study

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

Minimum requirements for capability indexes

- Machinery capability $C_{mk} \geq 1{,}67$
- Short-term process capability $C_{pk} \geq 1{,}67$
- Long-term, process performance index $P_{pk} \geq 1{,}33$

Short-term process capability (C_{pk})

First-time analysis of the short-term process capability has to 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. A regular analysis of the SPC-recordings (preferably automated) has to be conducted with the start of the pilot series at the latest.

Long-term process capability

The long-term process capability has to be provided as soon as it can be determined according to the above mentioned regulations.

The short-term process capability needs to be planned in such a way that all proof is available before initial samples are taken.

Central Manufacturing

Central manufacturing has to be strived for regarding all controllable characteristics. For significant characteristics, it is required that a controlled and capable process is documented through continuous and systematic analysis of process control results according to set policy and statistical process control.

Significant characteristics that are non-controllable or non-capable require an adjustment of specification limits as well as tolerances of work pieces respecting all boundary conditions of statistical process control.

For non process capable characteristics, 100% sampling has to be performed. The measurement values have to be documented and evaluated before initiation of any shipping or further processing.

3.4.12. Initial Sample Testing

REQUIRED DOCUMENTS

- ✓ Initial sample evaluation
- ✓ Approval

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

All quality characteristics, as defined in the applicable drawings and specifications, must be sampled with regard to measure, material, function, reliability, optic, haptic, and hallmark (e.g., manufacturer code). This holds also for internal characteristics defined by 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 device, and staff).

Storage of reference samples

Reference samples from initial sampling have to be stored by the supplier in an appropriate manner for at least 10 years.

Reason for Initial sampling:

- First-time order of a product
- Product change
- Supply disruption for a period of 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, moulding tool, punching tools)
- Change of production site or deployment of new or translocated machinery.
- Re-qualification in case of significant non-conforming products, see section 2.6.

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

The supplier is obliged to inform the VAILLANT GROUP in advance and to supply initial samples (pre-samples, if applicable) after consultation with the VAILLANT GROUP in the cases of:

- Changes to materials or parts incorporated in his products,
- Supply disruption for a period of more than one year
- Supplier switch and, respectively, sub-supplier switch by the supplier
- Changes to his 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, moulding tool, punching tools)
- Change of production site or deployment of new or translocated machinery.

Initial samples have to be provided together with a completed initial sample test report. During manufacturing with similar tools, for each tool and mould cavity, an individual test report has to be created.

Submission Stages

Depending on submission stage 1-4, different documents will be requested as proof.

In the context of quality planning, the requested documents will be coordinated between the VGPA (VAILLANT GROUP Part Approval) and the supplier.

	Part approval level			
Requirements for part approval review	**1**	**2**	**3**	**4**
Signed part approval sheet	x	x	x	x
Initial Samples		x	x	x
Dimensional report (relating to stamped measurement drawing)		x	x	x
Stamped measurement drawing		x	x	x
Material test certificates		x	x	x
Appearance test report		x	x	x
Logistics: Packaging-, labeling advice		x	x	x
Traceability Label, Check with Barcode Checklist		x	x	x
Process Validation and Preliminary Capability Studies		x	x	x
Design FMEA			x	x
Feasibility: Simulations, Calculations, …			x	x
Performance- / Functional test reports			x	x
Lifetime test report			x	x
Field test report			x	x
Homologation test report / certificates			x	x
Process FMEA			x	x
Process Flow Chart - Control Plan)*			x	x
Measurement equipment: R&R studies			x	x
Shipping audit (Product audit) control plan			x	x
Part Approval documents of sub-assembly & components			x	x
Audit Report required (Supplier visit)				x

Documentation

Control results and records have to be recorded within the initial sample test report and provided to the VAILLANT GROUP together with the initial samples by a set deadline.

These initial samples have to be clearly marked as such.

The supplier shall grant to 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 the purpose of manufacture (including quality assurance, data-management etc.), use and distribution of the VAILLANT GROUP products. Supplier is obliged to provide on request or by audit all relevant certificates and declarations related to delivered product (CE,ISO 10204…). In the event that the documentation has been produced on behalf of VAILLANT GROUP and has been paid for - as the case may be, by the costs of the supplied products or on the basis of 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.

For the identification of characteristics, identical numbers have to be used within the test report and accompanying VAILLANT GROUP approved reference drawings.

Assemblies which are manufactured according to a VAILLANT GROUP construction, including all individual parts, have to go through an initial sample test with the results to be presented to the VAILLANT GROUP.

The supplier has to sample assemblies for products that are constructed by the supplier himself and present the results to the VAILLANT GROUP. Initial samples also have to be taken for to individual parts and, if applicable, to sub-assemblies as well. VAILLANT GROUP is got to be granted access to these documentations on request.

Sampling inspection activities falls within the supplier’s responsibility. VAILLANT GROUP, however, reserves the right to verify the supplier’s sampling inspection results.

Further agreements between the supplier and the VAILLANT GROUP that either extend or restrict the before mentioned rules regarding initial sample test can be made.

Required samples which cannot be manufactured under series production conditions due to scheduling reasons are called pre-samples.

Product and Process Approval

Approval of the initial samples is given after assessment of the sample test results or, where applicable, after assessment of the supplier process audit results.

After that one of the following decisions will be made:

- Approved: After order issue by VAILLANT GROUP Purchasing, series production may start.

- Rejected: Deviations have to be remedied and new samples and inspection results to be presented to the VAILLANT GROUP before series production may start.

These decisions will be documented on the VGPA and potential remarks will be added (e.g., requirements), if necessary.

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

4. Requirements after Start of Production

After start of production, all agreed requirements have to be fulfilled and will be checked on a monthly and quarterly basis and monitored by the VAILLANT GROUP, as described in Section 2.7. In case of deviation of a supplied part, VAILLANT GROUP's non-conforming products process has to be applied and – if necessary – a process audit has to be conducted.

4.1. Determination of Serial Process Capability

REQUIRED DOCUMENTS

- ✓ Process Capability Report

According to Section 3.4.11 the process capability has to be provided if requested by the VAILLANT GROUP at any time, especially within a process audit. Moreover, the requirements regarding a centred production approach have to be fulfilled.

For the determination of the process capability, it is necessary that the process operates under statistical control - meaning that all systematic influences are 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 has to conduct and document internal process audits as requested by DIN EN ISO 9001. In case of deviations, this documentation has to be provided to the VAILLANT GROUP on 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 have to 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, defined by the German Association of the Automotive Industry.

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

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

Score	Name	Action
80-100%	Capable	Improvement actions
66-79%	Limited capability level 2	Corrective actions needed
51-65%	Limited capability level 1	Corrective actions and re-audit needed
0-50%	Not capable	Block supplier for further business, transfer current products

4.3. Shipping Audits

Shipping audits are part of the control plan (refer to section 3.4.5). In case of deviations, containment actions have to be implemented, tracked, and documented.

4.4. Measurement System for Significant Characteristics & Calibration

REQUIRED DOCUMENTS

✓ Capability Indicators

As stipulated in section 3.4.6, an efficient measurement system has to be implemented in order to control the significant characteristics (refer to section 3.4.4.). Both, the monitoring of the measurement system and the calibration are integrated in the system of Total Productive Maintenance (TPM). This means that capability performance indicators have to be archived and -if requested- provided to the VAILLANT GROUP.

4.5. Reliability Checks

REQUIRED DOCUMENTS

✓ Evidence

The conduction of reliability checks is a mandatory requirement as specified in the control plan (refer to section 3.4.5). The reliability checks have to be documented in an evidence document and archived so that they can be provided to the VAILLANT GROUP upon request.

4.6. Documentation and Archiving of Quality Data

REQUIRED DOCUMENTS

✓ Document Mgmt System

The supplier must archive all resulting quality data, in particular but not limited to data from control cards, inspections, audits as well as regulations on dimensional checks, calibration, and failure containment for a period of at least 10 years.

4.7. Change Management

The supplier shall give the VAILLANT GROUP advance written notice of changes to his manufacturing process, materials or parts incorporated in his products, any changes of the design of the products, of relocation of production plants, of his sub-suppliers, of modifications made to the methods or facilities for the testing of the products, or to other quality assurance measures. The supplier must give the VAILLANT GROUP sufficient time to check whether such changes may have a detrimental effect on the Contractual Products. The supplier shall report all changes to the VAILLANT GROUP including all corresponding performed measurement. In any case, the VAILLANT GROUP will evaluate the change. Any modifications of the Contractual Products with regard to the descriptions listed in Annexes 1 and 1a to the Outline Supply Agreement require the prior written confirmation of the VAILLANT GROUP by signet VGPA.

4.8. Traceability

The supplier shall 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, he can immediately establish which other products might be affected. VAILLANT GROUP shall not be obliged to accept products that are not adequately marked, or without an adequate identification substitute respectively, but shall be entitled to return them to the supplier at supplier's expense.

Tracing needs to be designed in such a way that a clear and gapless tracking from delivery data back to the designated workstation is ensured, also down to the sub-supplier level.

Correct position of identification will be laid down in the specification and or respective drawing of the product. For the purpose of tracing of important components, the VAILLANT GROUP standard VN 208 (trading goods) outlines a machine-readable optical label with the corresponding information. The corresponding label creation software is provided as freeware by the VAILLANT GROUP.

For the traceability of parts within the production process the supplier shall refer to the VAILLANT NORM VN 209 which will be provided by the VAILLANT GROUP on request.

All non-conforming products, parts, semi-finished and finished parts or products have to be marked and stored clearly without ambiguity so that no confusion is generated and mixture with conforming products can be eliminated. Colour coding, bar coding, and the usage of marker tags or stamps are appropriate tools.

For parts where a possible mix-up can only be detected using measuring techniques, suitable procedural actions have to be established. If such actions are not available, an additional eye-catching labelling has to be used.

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

All steps have to be arranged so that defective parts can be localized within the smallest possible area, even after a longer period of time.

Supply chain and corresponding quality data for all parts containing characteristics with mandatory documentation requirement has to be traceable. This applies especially to the value chain on all levels of sub-contracted partners. The traceability has to be manifested across all relevant levels in a appropriate system, so that all corresponding necessary information can be provided within 24 hours to the VAILLANT GROUP, if requested.

As a minimum requirement, all parts have to contain information on batch number, date of production, and other identification numbers. Machine-readable and electronically solutions are preferred and strongly recommended. Below the different types of batches are given

- Raw material batches
- Delivery batches
- Production batches

The supplier shall define and operate his own disturbance management system.

Documentation of Revision

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	First update according the VAILLANT Group	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	Second update according the 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 according the updated DIN EN ISO 9001.	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	Update according to VAILLANT Group Standards	2.4.-2.6., 3.4.4, 3.4.9., 4.2., 4.8.
2018	2019-06-05	Stano Michal Dobias Anton	Anton Dobias	Update according to VAILLANT Group Standards	2.2 , 3.4.12

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