



Guidelines for Suppliers

PVS Quality Management

Introduction

The purpose of these Guidelines for Suppliers is to inform our potential suppliers about the required processes at PVS before business relationships are taken up with them. The Guidelines describe the handling of the products to be delivered, from the advance quality planning over the presentation of samples and the production and product approval process (PPAP) to the comprehensive evaluation of series deliveries.

1. Quality Philosophy

1.1. Quality and reliability.

PVS products have a worldwide reputation as innovative products that convince their buyers with long durability, safety, high performance and a particular running smoothness. The resulting strong market position of PVS is based on quality and reliability. These two concepts are part of the identity of our products; they are a central competitive factor while also being the decisive elements that secure added value and jobs.

As quality and reliability are decisive market factors for our products, the quality management at PVS goes beyond the usual extent.

Independently of our suppliers' obligation to produce and supply products free of defects, we rely on our partners' cooperativeness and on a cooperation with them that is based on trust. But customer satisfaction can only be achieved if the product quality is secured by ZERO-FAULT schemes in the entire supply chain. We therefore expect our partners to be able to prove an effective quality management system at least compliant with the DIN ISO 9001:2000 standard or, if such a system does not exist, to be ready to implement it.

The quality management of PVS not only qualifies and evaluates the quality of supplied products and the punctuality of their arrival but also deals with the adherence to measures for securing the quality of intermediate products at the supplier's works and the suppliers production processes, testing procedures, waste disposal schemes and warranty of the product under the contract.

1.2 Basis of quality standards

The decisive basis is defined by the binding specifications and drawings with change index which are submitted when the order is placed, including the standards mentioned in them, e.g. PVS works standards, national and international standards, technical conditions of delivery, data sheets, provisions of the law, packing regulations, specially agreed testing regulations and test devices, other regulations etc. The most recent versions of the above-mentioned documents shall apply. They shall also cover materials and parts that are purchased from third parties by the supplier. Quality assurance measures shall be performed by PVS and the supplier and require an intensive cooperation of both parties. They



cover the reasonable choice of suppliers based on an objective evaluation of their quality capabilities and quality performance as well as initial-sample tests and the evaluation of parts produced in series.

2. Quality Capability of Suppliers

2.1. Quality management system

The supplier shall use a quality management system that is laid down in writing and fulfils the requirements of the DIN ISO 9001:2000 standard. He shall produce and test the products in accordance with said QM system, i.e. he shall implement quality assurance measures at the points at which faults can be caused, thus putting the main emphasis on the basic idea of preventive quality assurance for avoiding faults (zero-fault principle).

2.2. Evaluation of the suppliers (audit)

The supplier's quality management system will be evaluated by PVS and/or its customers. For this purpose, qualified staff members of PVS or its customers will inspect the processes and measures of the supplier's quality assurance system on his premises at dates agreed in advance. After the evaluation is completed, the supplier will be informed of the result orally and/or in writing.

2.3. Project Schedule

With the acceptance of the order, the supplier undertakes to provide a project schedule within two calendar weeks, which must contain at least the following information: commencement date, procurement, production and optimization periods for materials, machines, tools, devices and test devices, anticipated due date for first parts, initial samples with initial-sample test report, use for series production.

2.4. Meeting with the supplier

On the basis of the existing drawings, a meeting will be held on the premises of PVS or the supplier if required, the aim being to reach a binding determination of the producibility of the part with regard to dimensions, function, characteristics, properties etc. Both parties undertake to point to possible risks concerning producibility, process safety, further processing, environmental impact etc. and to propose possible countermeasures. After prior agreement, PVS and the supplier may invite external expert advisors to said meeting. The suppliers' responsibility towards PVS will remain unaffected.

3. Quality Assurance and Supply in Series

3.1. Provision of samples

The purpose of the provision of samples is to prove, prior to the commencement of series production, that the supplier is able to fulfil the quality requirements agreed in drawings, specifications and other documents. For this purpose, the supplier shall produce a manufacturing flow chart in which all planned testing steps from the receipt of goods to the dispatch of the parts as well as the relevant test schedule, documentation and archiving are indicated. The production flow chart shall be provided to PVS on request

3.2. Types of samples

'Initial samples' means products and/or materials under the contract which are produced only with series production resources under series production conditions and which are in compliance with the drawing and specification requirements of PVS.

'Other samples' means products and materials which are not produced under series production conditions but which comply with the drawing and specification requirements of PVS.



3.3. Production and product approval process for supplied parts

The production and product approval process for supplied parts shall be used principally for new parts, for renewals of tools and moulds and for repairs. In the case of changes made to documents (e.g. drawings, specifications etc.), the process will be applied as well.

The supplier undertakes to request an approval from PVS on a timely basis and in accordance with the determined regulations on the production and product approval for supplied parts in the following cases:

- product changes,
- production relocations,
- process changes,
- changes of materials,
- long production interruptions,
- new sub-suppliers.

Principally, an internal approval must be performed and documented verifiably after each change is performed. In addition, the parties may make agreements which supplement or restrict these regulations for the supply of initial samples. This also applies to the number of parts to be supplied as samples.

Samples must be provided for all quality characteristics agreed in specifications and relating to dimensions, materials, function, reliability, appearance and other attributes. If applicable, the compliance with provisions of the law (e.g. environment, safety, waste disposal) must be proved. In addition, the release documentation for agreed and/or specially marked characteristics (D or R features, dimensions marked with a scope of testing in accordance with the DIN 406 Standard, Parts 10 and 11, so-called zeppelin and stadium dimensions, testing and verification dimensions) must contain information about the provisional process capability

3.4. Other samples

Other samples must only be supplied on the request of PVS. An approval of other samples, e.g. experiment and installation samples, does not mean an approval for series production at the same time and will not form the basis for any waiver of the dealing with initial samples.

3.5. Initial-sample tests by the supplier

The drawings and specifications agreed between PVS and the Supplier shall form the basis of the initial-sample tests.

Those characteristics which influence functionality, installation conditions, reliability, further processing and exchangeability should be emphasized and marked as such.

The Supplier will use testing procedures and test devices of his choice which enable him to test parts and units manufactured by himself or by third parties for conformity with the given specifications in a problem-oriented manner. Any deviating testing procedures shall be agreed between the parties in good time if necessary. If the tests require special test devices which the supplier does not dispose of, he may order third parties, e.g. an authorized external testing institution which is accredited according to ISO 17025 or comparable national standards (e.g. EN 45001). Independently of this, the Supplier's responsibility shall remain unaffected.

3.6. Creation of the production approval documentation

The tests to be performed on the supplier's premises shall be carried out on the basis of the valid technical documentation provided by PVS, which are drawings, specifications and/or other supplementary documents as a rule. In this context, the following should be kept in mind:



- The provision of initial samples will only be permitted if the initial samples have been produced entirely with series production resources and under conditions corresponding to series production.
- For each provision of samples, whether they are initial or subsequent samples, the documentation corresponding to the agreed class of parts will be required.
- To be able to ensure and understand that the samples correspond to the measured values, whether from single or multiple standards, the individual initial samples must be marked with object numbers.
- The samples and documents, together with an application for approval signed in a legally binding manner (PSW or cover page of the VDA-EMPB) shall be sent to the delivery address prescribed in the order. The packaging and the delivery documents shall be marked clearly with the note “ERSTMUSTER” (initial sample).

3.7. Counter-testing by PVS

After the presentation of the initial samples and the corresponding documentation, PVS will carry out tests at its own discretion within the scope of the agreed drawings and specifications.

As appropriate, a joint test may also be carried out at the Supplier's premises. On the basis of the existing results, one of the following decisions will be made:

- Approved.
- Approved subject to reservations.
- Not approved.

The supplier will be informed of the result in the form of a test report issued by PVS. The approval procedure will include a graduated manufacture of the product under the contract in limited quantities as follows:

- Approval(s) for (a) limited quantity/quantities until process safety from the part of the supplier and at PVS is recognizable,
- Approval(s) for series production if no corrective measures are necessary.

Approvals of any kind will not relieve the supplier of his obligation to supply in accordance with applicable drawings and specifications.

3.8. FMEA (fault possibility and impact analysis)

Unless otherwise agreed, a process FMEA shall be produced by the supplier. The aim of the process FMEA is to analyze the planned manufacturing and assembly process in order to ensure that all quality requirements are complied with. In this case, the supplier shall give the possibility to view his FMEA documents. If a process FMEA is produced in cooperation with PVS, it will be made available to PVS on request.

3.9. Machine and process capability

As part of the preventive quality assurance and in accordance with the zero-fault principle, the supplier shall perform machine and process capability analyses at least for agreed and/or specially designated characteristics. The determined classification numbers will be documented provably. The Supplier undertakes to approve machines and processes only subject to the following conditions:

Machine capability	cmk > 1.67
Process capability	cpk k 1.33 100% test
In the case of incapability	100% test

The proofs of machine and process capability shall be produced following the DGQ publication 16-31. For the special characteristics, the process capability shall be proved as a permanent process-accompanying measure in the form of a quality control card (QRK).



3.10. Test methods

Test methods and the test devices used shall be agreed with PVS if applicable. For the special characteristics, a test device capability analysis is necessary in order to prove that measurements are reproducible in case an insecurity of measurements exists. The test devices must be procured by the supplier or exist on his premises and must be subject to a systematic test device supervision.

3.11. Products provided by PVS

Within his manufacturing department, the supplier will be responsible for the safety of the products which PVS provides for further processing. In the case of any quality or quantity deviations of the provided products, PVS shall be informed without delay. This will not relieve the supplier of his responsibility for supplying faultless parts.

4. Quality Assurance for Supply in Series

4.1. Receiving inspection of goods / corrective measures

Traditional receiving inspections of goods have become less important. At PVS, they are now only carried out as identity checks and only in special cases in a problem-oriented manner, i.e. in order to check if agreed corrections to critical parts have been made. Faults in a ppm-range can hardly be detected during receiving inspections in the form of spot checks.

Independently of the supplier's responsibility for quality which is regulated by the law, PVS must be able to rely on the supplier's efficient quality assurance measures. Those measures relate to:

- quality planning,
- quality assurance measures taken by the sub-suppliers,
- process safety and production supervision,
- effective quality assurance measures.

In view of the zero-fault principle, the development of sources of error must be prevented in the early phase already. For this reason, the main emphasis in the production process must be put on the process capability. The reduction of sources of error and the increase in process safety result in a reduction of rejects and therefore in an increase in productivity.

If, during further processing, PVS discovers that parts manufactured by third parties are faulty, they will be returned to the Supplier immediately together with a test report. This questionnaire (similar to the 8D report according to VDA) should be answered comprehensively, in detail and with the corrective measures being specified in order to prevent the renewed occurrence of the fault.

PVS reserves the right to verify the effectiveness of the assured corrective measures on the premises.

4.2. Ship-to-stock agreement

The aim is to replace the receiving inspection of goods by a ship-to-stock agreement (STS) in order to avoid double inspections and the resulting costs. For this purpose, separate agreements are made with our partners.

4.3. Evaluation of suppliers

The PVS evaluation system guarantees an optimum evaluation of the supplier's product quality. With the quality evaluation in connection with preventive quality assurance measures, PVS wants to create the preconditions for preventing defective goods from entering the production process.

The evaluation of suppliers is performed cyclically and comprises the following characteristics, which are weighed differently:

- Frequency of complaints about the contractual partner
- punctual deliveries / compliance with due dates



- reactions to complaints

In individual cases, the result of this selective quality evaluation decides about the need to have discussions with the supplier concerning the optimization of the quality or any necessary corrective measures.

In addition, the result of the evaluation of suppliers is the valid standard for the continuity and extension of the business relationships with our suppliers.

5. Miscellaneous

5.1 Packing/dispatch

The choice of the type of packing will be part of the offer and will be determined definitely by PVS before the order is placed. Any damage to the transported items must be precluded.

Suitable procedures for quality assurance in transportation, dispatch and storage shall be agreed with PVS and laid down in writing. In addition, the packing regulations (VO) of PVS, which are submitted to the supplier before the order is placed, shall apply.

5.2 Labelling of the deliveries

For identification, a label which precludes wrong delivery must be fixed clearly visibly to the delivery documents and/or the packing units for transportation and directly to the product packing. The label must include the following information:

- the supplier's address,
- PVS order number,
- material number together with change status,
- quantity of the packing unit,
- production and lot number together with date

If packaging is reused, any old or invalid labels and/or markings must be removed.

In special cases, the packing will be provided by PVS as a circulating packing which will have to be used. Any deviating types of packing must be approved by PVS.

5.3 Purity of the surfaces

Apart from the agreed protection against corrosion, the packaging must not show any contamination, e.g. traces of lubricants left from processing.

The planned cleaning processes, cleaning agents and corrosion preventives must be agreed with PVS and stated in writing; the same applies to the degree of purity to be reached and to the test devices and testing procedures to be used.

Any changes to those procedures must be reported in writing and approved by PVS in advance.

5.4 Reservation of changes

The contents of these guidelines may be changed and/or supplemented if the need arises.

PVS-Kunststofftechnik GmbH & Co. KG

Salzstraße 20, D-74676 Niedernhall

(Orderer)

.....

(Supplier)

.....

