HBPO-

Guidelines for Cooperation on Purchased Parts

Contents

Foreword

In international competition the reputation and success of HBPO GmbH (HBPO), as a recognised supplier in the field of vehicle systems, in particular front-end modules, is decisively influenced by the quality of its products. The quality of outsourced supplies has a direct influence both on our products and on the processes for manufacturing them efficiently.

These guidelines are intended to inform our suppliers of the requirements which will enable us to achieve our mutual objectives.

In the spirit of our shared commitment to the zero defect principle, we expect that the quality assurance measures operated by our suppliers will concentrate on the planned and systematic avoidance of errors. This requires their active cooperation at all stages of the process, from the initial product conception via the development phase and the series process right down to recycling and disposal.

As a result our suppliers have both greater scope for cooperation in designing the process and greater responsibility. The procedures described in these guidelines are intended to promote our cooperative partnership in the interests of a shared long-term improvement process.

The contents of these guidelines are binding and apply together with the supply contract and HBPO's purchasing conditions. They are also binding to the supplier's own suppliers.

1 Quality and environmental management

In order to assure product and service quality, HBPO requires its suppliers to introduce and maintain an efficient QM system which will meet the international requirements of the automobile industry.

HBPO requires, as a precondition, a QM system in accordance with IATF 16949 or, as a minimum requirement, ISO 9001/2. This can be confirmed by a certificate from an accredited certifying body, by the audit results of automobile manufacturers of other known customers. HBPO reserves the right to perform its own audits at any time with regard to system, process and product.

HBPO expects its suppliers to operate an environmental management system which will observe the standard regulations applied nationally and in the industry, minimise the consumption of resources (earth, water, air, energy, raw materials) and meet the requirements of HBPO and its customers for the recycling and disposal of the supplied products in a demonstrable manner (cf. DIN EN ISO 14001 or EMAS).

Energy management systems of suppliers shall be aligned with the requirements of DIN EN ISO 50001 or EMAS and shall be proved by providing of accordant valid certifications to HBPO. The supplier will send HBPO a new certificate without being requested after the expiration of the certificate. In case of withdrawal, HBPO must be notified immediately.

The supplier concludes a Quality Assurance Agreement with HBPO (INT-F-194) in the respectively valid version.

2 Procurement phase

2.1 Enquiry

The supplier will receive the enquiry from HBPO's purchasing department. This contains the necessary project data and documentation. The supplier agrees to treat as confidential both the HBPO enquiry and all the related commercial and technical details.

2.2 Offer

The offer must be complete and detailed in accordance with the enquiry. Only such offers will be considered. Criteria for the selection of suppliers will include technical and commercial competitiveness, established project management, a logistics system with electronic data exchange, and quality considerations.

2.3 Placing of orders

The decision in favour of a supplier is made on condition that the supplier provides a binding assurance that he can meet the targets laid down with regard to quality, price, cooperation, tooling and delivery dates, from the development stage to series manufacture.

After the decision on the supplier, there will be an initial discussion with the selected firm. After this point, the supplier will (from the definition and development stage to the beginning of series production) maintain documentation for every product with regard to quality, parts price, tooling costs and scheduling in accordance with HBPO requirements (project management with reviews). He will submit the results at any time at HBPO's request.

HBPO reserves the right to monitor the quality and competitiveness of suppliers and their own suppliers by the relevant measures (e.g. system and process audits), and to check and compare the project status with all those involved in the process chain.

HBPO's orders are placed on the basis of the HBPO purchasing conditions in their latest version, together with components of any individual contract relating to a particular order.

If required, HBPO will conclude a special non-disclosure agreement in addition to the confidentiality provisions of these guidelines.

3 Preventive quality measures

Operating on the zero-defect basis requires consistent advance quality planning to avoid errors. For this purpose, the preventive quality requirements laid down by IATF 16949 and VDA publication Volume 2, VDA publication Volume 4, Part 3 will apply. In this respect, HBPO differentiates between development suppliers and series suppliers (cf. 3.4).

3.1 Project management

The demand for ever shorter development times, lower costs and increased planning security requires the decisive application of structured project management procedures (cf. VDA publication Volume 4, Part 3).

As part of the project discussion between HBPO and the supplier all the relevant tasks, milestones and project targets with regard to specification, cost, quality, cooperation and scheduling will be discussed by all those involved, and agreed on a binding basis. This data will be integrated into the HBPO project management system and is binding as the framework plan for the project. The supplier must inform HBPO immediately about any modification of the data and targets laid down in the project discussion and such modifications must be approved by HBPO.
On the mutual project team (supplier, HBPO) the planned tasks will be carried out jointly and monitored on the basis of reviews.

3.2 Reviews

Throughout the whole process, in which the product is created (from the definition and development stage to the beginning of series manufacture), there will be fixed milestones for checks on the development and planning status (reviews) with the participation of HBPO. The review results must be documented in writing.

Depending on the relevant phase, the following points must, among others, be covered:

- status and level of completion of development / design / testing
- status of documentation (e.g. drawings, test reports, specifications, manufacturing and testing stages, FMEA, ...)
- status and level of completion of specification sheet / requirements for specification and drawings
- status and level of completion of preventive quality measures
- status of tool production
- status and level of completion of production and testing planning
- status of the agreed time schedule.

3.3 Check if order can be fulfilled

Before making an offer and acceptance or modification of a contract, the supplier must check if he can meet all the relevant requirements and stipulations. These analyses will be based on the scope of the tasks as defined by the initial project discussions. The basis for such checks will be experience based on comparable products or processes and can be related to the new product or process. The result of these analyses must be documented in writing and submitted to HBPO. The supplier is also required to check the completeness of the documentation he has received. Any missing data needed for processing the project must be obtained from HBPO in writing.

3.4 Product development

The development supplier receives the HBPO specification sheet as the basis and target for the product which has to be developed or adapted. On the basis of this specification sheet and the framework project plan, the supplier draws up a product development plan. This lays down the necessary development activities, capacities and quality assessments, together with the milestones for each phase. The relevant procedures are described in the VDA publications Volume 3 and Volume 4 Part 3. Once a completed product development has been approved, this chapter is no longer relevant (= series supplier).

3.4.1 Specification sheet

The HBPO specification sheet is the basis for development operations. In addition to the product description, environment and interfaces, it contains all the general and technical requirements (cf VDA 4, Part 1).

Before the start of the development work, the specification sheet must be agreed on a binding basis between the supplier and HBPO and signed as the basis for the contract.

3.4.2 Maintaining drawings / update service

The development supplier is responsible for maintaining drawings, the update service and the relevant documentation. The design status will be documented for HBPO by completed product drawings which must contain, in addition to the product requirements with regard to special and critical quality characteristics such as SPC dimensions, test dimensions and D-characteristics, the approved materials and, in the case of component groups, the relevant parts list including the index of the individual drawing of parts index. Any markings required by HBPO customers to designate these characteristics must be taken into account. If the product to be developed also involves software, the supplier must document the individual development status of the software by means of suitable records (e.g. flow chart, programme listings, test results). The software documentation must be made available to HBPO.

3.4.3 Quality assessment / system FMEA - product

Parallel to the development operations, quality assessments must be planned and executed in accordance with the development status. These include:

- quality function deployment (QFD; VDA Volume 4)
- error possibility and influence analysis (FMEA; VDA Volume 4)
- tree structure error analysis (FTA), cause-effect diagram (VDA Volume 4)
- simulation methods (e.g. FEM, mould flow methods)
- special experimentation methods (VDA Volume 4)
- testing

The methods to be used in the project are agreed at the initial product discussion and during the current work on the project between supplier and HBPO.

3.4.4 Testing

Product trials are to be used to identify possible defects, problems or weak points which cannot be revealed by other quality assessments (cf. also Chapter 3.4.3) as early as possible in the development process. The basis for this is test planning and a corresponding production organisational plan in accordance with IATF 16949, which will be agreed with HBPO and contain at least the following:

- test procedure
- development status of the prototypes for the testing
- scope of testing (number of samples)
- detailed description of testing methods
- measuring devices, test facility
- assessment procedure (e.g. in accordance with Weibull : VDA Volume 3)
- documentation

The results of the individual tests must be documented (target/actual value) and traceable. They serve among other things as the basis for drawings and specifications.
For products which involve software, the software must be tested comprehensively during the development process.

3.4.5 Binding specification

The results of the product development are documented in a binding drawing and/or specification. Therein contained technical requirements must describe the product precisely and completely, and they must be capable of production under series conditions.
The drawing and specification will be drawn up by the supplier and approved by HBPO.

3.5 Process development

With the help of a process development plan, all the tasks are described needed for the creation of a manufacturing process which will meet the relevant quality requirements. These tasks have to be carried out parallel to the product development or carried out after the conclusion of the product development in good time before the start of series production. The necessary procedures are described in the VDA publication Volume 4, Part 3. Before start of deliveries, the supplier must demonstrate the process capacity to HBPO.

3.5.1 Tooling planning

For all parts, the supplier will draw up schedules for the tooling. These range from the design of the tools via their production to initial sample approval. The schedule will show the progress made and the main milestones for all tooling details.

The draft tool design must be shown to HBPO for consultation and approval. For tooling for the production of synthetic parts, such items as tool separation, knockout markings and sprue positioning must not be determined without the agreement of HBPO.
The parts must be marked in accordance with the status of agreement and documented in a partial life cycle.

3.5.2 System-FMEA: process

On the basis of the system-FMEA, which accompanies product and planning, the manufacturing process must be evaluated and documented with regard to risks. The procedure and documentation must be in line with the VDA publication Volume 4n. The FMEA must be made available to HBPO in the respective operational status.

3.5.3 Planning of production and testing

In every phase (sample, prototype, pre-series, series) the supplier must plan, implement and document in the test plan the relevant production and testing stages. For this purpose, the supplier will operate a system which covers the agreement, definition, documentation, management and approval of the following points:

- major quality characteristics and product features
- process parameters
- process and production procedures
- production facilities
- test procedures
- test equipment
- tolerance values, tolerance samples
- documentation
- sourcing of products and materials
- sourcing of equipment.

For agreement and documentation of the development process, the following information must be provided to HBPO:

- flow chart (production and testing stages from incoming goods to shipping)
- process parameters and tolerances
- important product and process factors
- results of machine capacity analyses, process capability analyses and test equipment suitability analyses
- finished product drawing
- testing and operations plans.

3.5.4 Quality suitability of processes

The target of function and process-oriented product design and production is manufacturing with efficient and controlled processes. Such processes must be certified by means of capacity analyses. For such analytical procedures and interpretations, the contents of VDA publication Volume 4 Part 1 also apply.

For all quality relevant factors, the necessary capability analyses must be planned, implemented and documented. In line with the requirements of our customers, the following minimum tolerances must be observed with regard to quality:

Machine capability index $C_{mk} \geq 1{,}67$

Process capability index $C_{pk} \geq 1{,}33$

If required, these thresholds may be modified by HBPO in line with the requirements of its customers. This is to be specially determined in the specification sheet.

Once the quality capability of a process has been demonstrated by the above methods, the process has to be monitored continuously by means of quality control charts (SPC).

If the quality capability of a process cannot be demonstrated, the relevant properties must be ensured by 100% testing.

3.6 Production process and product approval

3.6.1 Process approval

Production process and product approval (PPF) serves as proof that the supplier can produce the requirements which have been agreed in drawings and specifications under series conditions (facilities, series processes, materials flow, cycle time, quantities). The date of the PPF must be selected in such a way that the subsequent product approval and possible improvements in the process can be carried out before series deliveries begin. For the planning and implementation of the PPF with the participation of HBPO, the following factors must be observed, among others:

- Are all valid drawings / specifications available?
- Has the process already been operated under series production conditions and approved internally by the supplier? Have the drawings / requirements specifications from this initial approval been certified?
- Do the production and testing facilities correspond to series status and is the relevant documentation up to date?
- Have the agreed quality measures been carried out and are the results available? (e.g. FMEA, capability analyses, test plans)
- Has the operational procedure of the SFA been agreed?
- Has the number of parts to be produced been defined; do these correspond to series status?
- Have the quality measures been implemented and completed at the supplier's own suppliers?
- Is the supplier's personnel trained appropriately according to the needs?
- Does the available packaging correspond to the defined series packaging?
- Has the number of parts, required for the initial sample, been defined and has the planning for initial sample approval been agreed with HBPO?

All deviations and improvements which arise from the PPF are documented in the programme of measures and implemented in accordance with the time schedule.

3.6.2 Product approval

An initial sample plan must be drawn up for the procedure of initial sample approval to the initial sample report. The sequence of operations and documentation must be implemented in accordance with VDA publication Volume 2.

All the properties from the drawing and specification must be tested on the initial samples. In the case of parts from multiple tools, at least 5 parts from every nest must be inspected.

The results must be documented in the first initial sample test report in accordance with the above VDA-publication. This must be made available to HBPO together with the

- specification tests
- initial samples
- capability analyses for properties which are important for quality
- test plan
- parts life cycle
- “Recycling“ questionnaire
  (appendix to HBPO form HBPO-F-036)
- collection of safety data “Substances contained in bought-in parts and semi-finished goods“
  (appendix to form HBPO-F-037)

Before the initial samples are presented, any deviations in the initial sample test report must be agreed with the responsible product development department and approved in advance.
Series parts can only be supplied after approval by the HBPO Technical Quality department. The VDA publication Volume 2 also applies and must be observed.

4 Series process

4.1 Product and process

During series deliveries, the supplier must supply the products in accordance with absolute delivery reliability at the agreed quality level and in such a way as it has been contractually agreed and approved on the basis of initial sampling.

The supplier must ensure by regular product audits (checks on products ready for shipment) that the products meet the specified requirements at all times. The manufacturing processes must be constantly monitored, evaluated and controlled. The process must be subject to statistical analysis.

HBPO reserves the right to carry out regular process audits to verify the suitability and capability of the applied processes. The conclusion of quality assurance agreements will be an objective.

4.2 Process modifications

Process modifications and/or the re-location of production shall not take place without the prior agreement of HBPO. Before any process modifications and/or re-location of production, a PPF must always be agreed and implemented with HBPO (cf. 3.6).

4.3 Complaints, defective products, approval of deviations

When any deviations are found in series production, a quality control report (QKB) is drawn up at HBPO. The supplier will be consulted immediately on the return of the products and/or the sorting and corrective operations at HBPO. Implementation of this at HBPO will be realized by the supplier or an outside company appointed by him or by HBPO, and will be at the cost of the supplier. Within the period specified by the "QKB", the supplier will submit to HBPO an 8-D report about the measures to remedy the defect and will immediately ensure that no defective products are supplied to HBPO. Where necessary, a written agreement will be concluded between the supplier and HBPO covering deviations in relation to a defined quantity over a specified period of time.

4.4 Increased freight costs

The supplier has the obligation to inform the transport department at the relevant HBPO factory about any increased freight costs (e.g. special journeys, special packaging, ...), regardless of whether such costs will be the responsibility of HBPO or the supplier.

4.5 Documentation, test records

The results of measures which have been implemented for quality monitoring and testing (process and product characteristics) and the correction of defects must be documented and stored systematically (cf. VDA 2).

4.6 Evaluation of suppliers

HBPO evaluates its suppliers annually with regard to the quality and punctuality of their deliveries. Development suppliers are also evaluated on the basis of their cooperation in the relevant projects (Chapter 3). The supplier is informed in writing about the results.

4.7 Shipment packaging

In consultation with HBPO, the supplier will arrange for a standard of packaging which will prevent any damage to quality. The marking of parts and containers must be in accordance with HBPO instructions and is laid down in the relevant supply contract.

5 Product safety, product liability and warranty

Defects relating to product safety can lead to liability claims against the supplier. The supplier's QM system must therefore be designed in such a way that possible defects can reliably be prevented. The relevant sections of HBPO's purchasing terms and the VDA publications will apply. The supplier undertakes to conclude product liability insurance with coverage which will be appropriate to the risks of the automobile industry to cover damage to goods and persons, including the cost of recall operations. Such insurance cover should be maintained beyond the term of this contract. At the request of HBPO, the supplier will provide the relevant information about the type and extent of the insurance cover, including the name of the liability insurer.

6 Re-Qualification Examinations

The supplier shall provide full measuring and functional testing of all products in accordance with the control plan, taking into account all applicable requirements (Customer specific/IATF 16949) for material and function. The extent of the re-qualification testing can be reduced for specific products in consultation with HBPO. Re-Qualification shall be performed yearly unless otherwise agreed to by HBPO. Control plan must be updated for any change to frequency or extent of testing.

7 REACh (among European states)

The supplier guarantees that all materials in the products (e.g., raw materials, supplies and components) which are delivered to HBPO are registered to REACh (Regulation 1907/2006: Registration, Evaluation and Authorization of Chemicals) when applicable. This includes registration for all sub-suppliers in the supply chain. Submission of this information is to be within the given timeframe for the intended purpose by HBPO. If supplier encounters any issues preventing the timely submission of this information, they must inform HBPO without undue delay.

If products (including packaging) that are delivered to HBPO include SVHC materials (**S**ubstances of **V**ery **H**igh **C**oncern) with a concentration greater 0.1%, these products are to be declared to HBPO. Current SVHC materials are published in the candidate list published by the EU which is kept up to date. The supplier has to be informed about the current state of the candidate list.

8 Applicable documentation / latest version in all cases

- VDA Publications

  Volume 1: Documentation and Archiving

  Volume 2: Quality Assurance of Suppliers

  Volume 4: Part 1 and 2 Quality Assurance in the Process landscape / Quality Assurance prior to serial application

  Volume 6: Part 1 and 3 and 5 QM System Audit / Process Audit / Product Audit

- Norm IATF 16949
- DIN EN ISO 14001
- ppm-Agreement
- Purchasing Conditions
- Quality Assurance Agreement