This AUDI AG Quality Manual sets out contractually agreed requirements of AUDI AG to safeguard the quality of parts and processes in the procurement and supply chain.

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Foreword

The AUDI AG Quality Manual details the general requirements for suppliers of purchased parts laid down by the Quality Assurance department of AUDI AG. The AUDI AG Quality Manual supplements the quality requirements laid down in the VW Group's "Formula Q" document series. Component-specific requirements are laid down in the component requirements specification issued by the Technical Development and in the drawings or technical specifications.

Along with enquiries for component sourcing, suppliers are provided with the documentation stipulating quality requirements for the component in question ("Formula Q" document series and AUDI AG Quality Manual). They must incorporate those requirements into their quotations, and on submitting quotations provide assurances that they are aware of the requirements laid down in the AUDI AG Quality Manual, that they acknowledge them, that they will adhere to them without restriction, and that they are responsible for implementing them within their own supplier chain, including any value creation passed on to third parties (such as outsourced manufacturing processes or process steps, production at secondary locations, "extended workbench" arrangements, contract production arrangements, etc.).

Suppliers must specifically identify any variation from or non-conformance to requirements laid down in the Quality Specification in their quotations. Where any variation from or non-conformance to requirements occurs in the course of component development, production and supply, the Quality Assurance department reserves the right to pass on the costs thereby incurred to the supplier in question.

The German version of the AUDI AG Quality Manual is binding. Any translations into other languages shall be secondary to the German version with regard to interpretation of conflicts.

Reproduction, use and disclosure is permitted only for suppliers within the supply chain of AUDI AG.

Collaboration between suppliers and the AUDI AG Quality Assurance department requires use of applications in the secure area of the B2B supplier platform www.vwgroupsupply.com. This in turn requires that suppliers register to log in to the secure area and accept the individual applications prior to contract award.

This version 3.0 has been completely revised relative to version 2.5, and its content and structure have been adapted to the co-applicable and likewise completely revised 4th issue of the "Formel Q-Konkret" (Formula Q: Specifics) document.
Referenced documents
The latest applicable versions of all referenced documents, document templates and forms are binding, including the documents which they in turn reference. Unless otherwise specified with regard to the following referenced documents, the documents concerned and their respective status can be found in the login area of the VW B2B supplier platform www.vwgroupsupply.com in the Group Quality Assurance or Audi Brand Quality Assurance section. The status at time of enquiry is decisive.

Group quality documents at www.vwgroupsupply.com
- Formula Q-concrete
- Formula Q-capability
- Formula Q-capability software
- Formula Q-new parts integral
- Quality verification in pre-production
- LAH 893.909.A Group software, basic requirements (applies to software and software-controlled on-board control units)

Audi Quality Assurance documents at www.vwgroupsupply.com
- Change triangle for marking of deliveries
- Guideline for determining machine and process capability
- Checklist: "Requirements relating to the production and testing equipment for electrical and electronic component assemblies"
- Checklist: "Requirements relating to the production and testing equipment for coolant hoses"
- Rules for file input in the case of complex parts and assemblies
- List of Conformity of Production (COP) contacts at the Audi plants
- Quality performance costs 0-km/ CKD/TDS
- List of IT interfaces to be maintained
- Procedure for handling of non-conforming deliveries (field damage cases) between AUDI AG and the supplier
- Emission measurements: File for transfer of measurement results; list of accepted test laboratories; acceptance criteria for test laboratories
- LAH 893 012 AUDI AG Requirements Specification: Forming (applicable to formed parts, weldments and assemblies, sheet-metal components)
- LAH 893 018 Requirements Specification: Surface finish requirements for painted exterior parts
  (applicable to exterior parts delivered ready-painted)
- LAH 893 019 LAWA Requirements Specification
  (gilt parts painted in the Audi paintshop for body-coloured mountings)
- LAH 893 857 Seat belts
- LAH 893 880 Safety equipment, Airbag
- LAH 895 800 A Production requirements specification for aluminium castings
- LAH 895 800 B Production requirements specification for aluminium extruded profiles
- LAH DUM 121 Engine cooling, coolant hose
Group standards listing at www.vwgroupsupply.com
Application "Online standards texts" in the Research and Development section:
- VW 01055 Reference Point System, RPS, Drawing
- VW 01058 Technical Drawings, Lettering
- VW 01154 Development Conditions, General Requirements
- VW 01155 Vehicle Supply Parts, General, Approval of First Supply and Changes
- VW 10119 Accuracy – Measuring accuracy in testing processes
- VW 10130 Machine capability testing for measurable characteristics
- VW 10131 Process capability testing for measurable characteristics

VDA (German Automotive Industry Association) documents and automotive standards, e.g. via www.vda-qmc.de:
- VDA document series: "Quality management in the automotive industry" and "Common quality management in the supply chain"
- 8D Report according to VDA-QMC
- ISO/TS 16949

Other referenced documents:
- Conditions of purchase for AUDI AG production material
- Software qs-STAT and guideline: "Verification of capability of measurement systems". Available directly from Q-DAS GmbH & Co. KG: Eisleber Str. 2, D-69469 Weinheim. Tel.: 0049 (0)6201 3941-0. E-mail q-das@q-das.de. Web: www.q-das.de

In addition, the technical conditions of supply and VW standards specific to the product also apply, including minimum service life, as well as legal requirements, rules, regulations, etc.

Note
On the Internet (http://www.vwgroupsupply.com) the information applicable VW Group-wide can be found under Group quality documents and the Audi-specific information under Brand quality assurance - Audi.
Updates to the AUDI AG Quality Manual will be published in future on the Internet (http://www.vwgroupsupply.com) under News.

Not all named referenced documents are translated to English or other languages.
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1. Requests and preparation of tenders

1.1 Tender requirements
Section 1.1 of Formula Q: Specifics applies without restriction.

1.1.1 Supplementary binding requirements

- Connection to Volkswagen Group B2B supplier platform at www.vwgroupsupply.com
- Further IT interfaces for the collaboration with AUDI AG QA, see referenced documents: "List of IT interfaces to be maintained"
- Provision of a centralised electronic mailbox: In the course of using electronic media to transmit quality data, we will in future be intensifying the degree of interconnection with our suppliers. For this, it is necessary for suppliers to establish a non-personal e-mail address ensuring unrestricted availability. The point of contact is the QTS Application Support department of AUDI AG.
- Provision of a German-speaking contact person.
- Correspondence with the AUDI AG Quality Assurance department in German.

1.2 Tender documents
Section 1.2 of Formula Q: Specifics applies without restriction.

1.2.1 Supplements to the enquiry documentation and requirements
Supplementary to the documentation listed in 1.2, the following documents and requirements must be provided and fulfilled:

- Quality planning, flow of defective parts (see also: VDA standard: "Analysis of defective parts in the field")
- Project-specific test aids (e.g. gauges, system models, measurement supports) must be taken into account in the quotation and precisely specified. The availability of general standard test aids (e.g. 3D testers, colorimeters etc.) is assumed as a precondition.
- Electrical components, assemblies and functional parts: The completed checklist: "Requirements relating to the production and testing equipment for electrical and electronic component assemblies"
- Coolant hoses: The completed checklist: "Requirements relating to the production and testing equipment for coolant hoses"
- Free-of-charge provision of the samples and documentation required for releases and sample testing (samples for type approval, initial samples etc.).
- Compliance with applicable environmental laws.
- Compliance with globally applicable legislation: The supplier is obliged to ensure compliance with current applicable laws in the respective markets and to provide AUDI AG with proof thereof as required. Any non-conformance to such requirements (e.g. loss of approvals or certification) must be actively notified to AUDI AG (see also referenced document: "List of COP contacts at AUDI AG").

1.3 Supplier's concept creation
Section 1.3 of Formula Q: Specifics applies without restriction.
1.3.1 Supplementary designation of responsible personnel
A competent, qualified supplier quality assurance representative, involved in SE and project working, is to be nominated at project kick-off. The person’s name, function and designated deputy are to be notified to the SE group and the BTV/TV via LION specific to each project at project kick-off. The personnel responsible for quality management and product safety at the production site are to be entered in the supplier database (www.vwgroupsupply.com) (see also section 4.2).

1.3.2 Production planning
The planned production processes, factory layout and supply chains should be graphically depicted in suitable form, such as by 3D views, animations and photos.

1.4 Quality framework agreement
Section 1.4 of Formula Q: Specifics applies without restriction.

1.4.1 Notification of changes in the production process and/or supply chain
Production relocations or major changes¹ in the production process must be notified to AUDI AG at an early stage and require the consent of AUDI AG Quality Assurance prior to implementation (see also VW 01155). The costs thereby incurred by AUDI AG QA for new samples will be billed to the supplier, unless otherwise agreed in specific cases in consultation with AUDI AG Purchasing. Samples required for the necessary releases must be submitted free of charge to AUDI AG Quality Assurance.

1 Changes in the delivery item, e.g. in the design, the material and its composition, the manufacturing process, the pre-supplier and/or the manufacturing site

The supplier is obliged to evidence the current status of its parts life cycle on request. The delivery of modified products is generally to be notified to each Audi location with the LION TGS (part generation status) system, alternatively with the Change triangle (see also Referenced documents). The marking is to be affixed complete and clearly visible on each delivery unit, appropriately protected against damage and loss. Any omission of marking must be agreed with the AUDI AG staff member responsible for the purchased parts concerned.

For relocations (including relocation within a site) a project plan and safeguarding concept must be drawn up and agreed with AUDI AG. When a relocation occurs, new samples of the parts concerned must be submitted to AUDI AG. In the case of parts subject to compulsory type testing, prior repeat type approval (BMG) is necessary. After any relocation a repeat 2TP is to be performed.

If the supplier relocates components to a different production site without being forced to do so by technical circumstances arising from new requirements defined by AUDI AG, or without having agreed a relocation with AUDI AG Purchasing, the costs thereby incurred by AUDI AG QA may be billed to the supplier.

If component relocations are not notified, or not notified promptly, to AUDI AG in writing, the supplier shall be deemed to have infringed against the above obligations and may be barred from new contract awards.
1.4.2 Supplements to module suppliers and designated parts
Where there are multiple direct contract partners, the supplier delivering the final assembly to the Audi plant where it is to be installed (system supplier) assumes overall responsibility.

The system supplier (assembly supplier with assembly activities and also with responsibility for single parts/assemblies) is also responsible for the conformance of its subcontractors to the quality assurance requirements.

For designated parts that also includes the following points:

- Ensuring and verifying quality capability and performance along the supply chain.
- Setting out quality assurance agreements, taking appropriate account of the AUDI AG quality assurance requirements.
- Safeguarding information flow between the contract parties.
- Definition of rules for handling of D/TLD parts and the necessary documentation.
- Definition of rules relating to component warranty and traceability.
- Sample testing of all components/assemblies from subcontractors.
- Ensuring performance of a 2TP prior to start of production at the subcontractors (successful completion of the new parts training programme QPN according to Formula Q: New parts – integral).
- Safeguarding component supply in terms of quality and quantity throughout the product life cycle.
- Application of Formula Q to the supply chain.
- Assumption of quality responsibility for customer-supplied products and designated parts with regard to assembly and delivery condition.
- Samples are submitted by the assembly/system/module supplier. Any non-conformance to or exemptions from this are to be separately contracted following consultation between the supplier and AUDI AG Procurement and Quality Assurance.

2 Quality criteria for contract award
Section 2 of Formula Q: Specifics applies without restriction.

2.1 Elements of the supplier assessment
Section 2.1 of Formula Q: Specifics applies without restriction.

2.2 Quality capability target agreement
Section 2.2 of Formula Q: Specifics applies without restriction.

2.2.1 Supplement to target agreement
When inviting tenders for new products, ppm targets are specified along with the enquiry which the bidder’s quotation must fulfil.

2 Supply chain see Terms and abbreviations

3 See also Formula Q: Capability, sections 8 and 14
Non-conformance to the ppm targets specified in the invitation to tender is only possible by way of a separate quality agreement (goal agreement) in consultation with AUDI AG Quality Assurance/Product Technology. Differing goals set out in suppliers’ quotations may influence contract award.

2.3 Design management framework agreement (KVV)
Section 2.3 of Formula Q: Specifics applies without restriction.

3 Working with suppliers in the product design process

3.1 New parts qualification programme (QPN-RG)/Maturity level assurance/Purchased part management
Section 3.1 of Formula Q: Specifics applies without restriction.

3.1.1 Applications in LION
In the event of new contract awards, only online processing with the LION-QPN module provided by way of the supplier platform of the VW Group will be accepted. All documentation and verification requirements set out in the following sections must be fulfilled only by way of the B2B online supplier parts information system LION, with the associated modules:
   a. TTA (Parts – deadlines – tasks)
   b. QPN (New parts training programme)
   c. CoRe (Commitment & Review)
   d. TGS (Parts generation status)
(see also referenced documents: List of necessary IT applications and interfaces). The procedure is subject to the requirements laid down in Formula Q: new parts – integral and the instructions contained in the QPN manual for suppliers, LION. All data and information must be furnished in German. Any variation from this requirement must be explicitly agreed with the responsible part manager.

3.1.1.1 Quality planning, design and pre-production
In the QPN the supplier must complete and maintain the framework quality schedule such that all product-related and quality-relevant deadlines and the project deadlines set by the customer (e.g. SOP, pilot production, PVS, quality assurance run, FMEA, test periods, BMF, sampling, 2TP, releases) are covered. The supplier is responsible for executing appropriate QFD analyses, feasibility studies, zero-defect strategies, design and process FMEAs (on request also in German/English) with resultant QA and measurement concepts (e.g. statistical tolerance chain analysis including the influence of attached parts and assembly variability), process flowcharts, equipment and maintenance planning. FMEAs should incorporate experience gained from identical/comparable products and processes (know-how store). The design FMEA must be submitted to AUDI AG Technical Development and the process FMEA to AUDI AG Quality Assurance. As part of development activity, the supplier must define key quality characteristics on the product and in the process. These must be agreed with the customer, e.g. in the course of SE work. Where customer specifications have been laid down in this respect, they must be assigned priority.
The supplier must draw up test plans and submit them to AUDI AG QA. The test characteristics on the product and in the process derived from the defined quality characteristics must be documented in the test plans. This applies in particular to D/TLD parts for which all characteristics subject to compulsory documentation must be included in the test plans.

Electrical components, assemblies and functional parts must be subjected to 100% checking with regard to the function of the delivered unit. Product- and project-specific requirements in the course of sampling and the QPN programme are set out in the product-specific requirements specification/technical conditions of delivery. Prior to procurement of mass production equipment and in-production testing equipment, the production concept must be agreed and defined in consultation with AUDI AG Quality Assurance.

The supplier must independently draw up a COP test plan in respect of parts relevant to Conformity of Production (globally applicable COP legislation).

By the first production tooling (SWZ) or small-lot production tooling (KSW) deadline as appropriate, the supplier must produce or procure suitable test equipment. The design of the said test equipment must be agreed in advance with the responsible part manager (BTV) at a test equipment design meeting (see also 3.3.3 In-process measurement system PBMS). The test equipment must be designed to permit testing of the necessary characteristics (e.g. function, dimensions, installation). The capability of all test equipment used must be verified by testing through to pilot production. Verification must be provided in accordance with the harmonised guideline of the European automotive industry on "Measurement system capability".

As part of the quality responsibility for related parts and components (for complete systems) which are assembled only at the preliminary or final assembly stage to form an assembly (such as the complete cockpit or the front-end module), for the purposes of independent assessment and agreement the supplier must additionally produce appropriate assembly test equipment (e.g. part master jigs, installation/mounting cubes) with adequate measurement systems.

In order to track planning and implementation activities, the supplier must regularly update the QPN module in LION throughout the product and process development phase. The assessments and relevant measures are to be carried out in accordance with the rulings laid down in the QPN for the respective priority index of AUDI AG QA.

At start of production delivery, a ppm programme for 0-km and field claims will be agreed and launched in order to ensure continuous quality improvement in production. AUDI AG Quality Assurance expects delivery of parts to schedule and in accordance with specifications and drawings. The parts must fulfil all functional, installation, dimensional, physical, chemical, kinematic, environmental and visual requirements, with verification recorded in the part history. To that end, all the requirements laid down in this Quality Specification must be met without restriction.

### 3.1.1.2 Part history/marking, quality verification for pre-production

Clear and permanent identification of the supplier, production location, Audi part number and date of production must be ensured.

### 3.1.1.3 Part history

At start of initial production for the pre-production phase a part history must be initiated (see also Referenced documents and specified IT interfaces). This must include all modifications to the part concerned, sample reports, releases and optimisation measures. Repeat deliveries entailing no status change do not need to be entered. The part
history must accompany the quality certification for the pre-production phase in the event of any change.

3.1.1.4 Marking in pre-production
In order to ensure unique identification of the status of all delivered parts, every part in every delivery as from the initial prototype must bear a unique marking and the delivered packing unit must also be clearly marked "NOT PRODUCTION PARTS" on the outside. If the specified method of part marking is not yet possible in the pre-production phase, an adhesive label should be used for the purpose. This must contain the supplier name, part number and designation, date of production and the drawing or agreement status.

If the safety function of safety-related components such as the airbag module, dash panel, pillar trims, seats, steering wheels, belt tensioners etc., is inoperative (e.g. in the case of sample deliveries), this "Inoperative" status and the lack of type approval must be clearly, permanently and traceably marked. This also applies to the "Inoperative" status of a single component or subassembly. The marking must be visible after installation, and must be agreed beforehand with the AUDI AG QA Product Technology/Production Purchased Parts.

In addition, a yellow circular label, as specified in Quality verification in the pre-production phase, must be affixed on the rear of all delivered parts during the pre-production phase. Parts painted by AUDI AG must be permanently mechanically marked with the generation status (see LAH 893 012). In the case of small parts which are too small to affix a label, or on which it is not possible to affix a label for technical reasons (e.g. if it would impair the function of oil-carrying components), the smallest possible packing unit should be marked. In the case of parts which come into contact with service fluids only on certain surfaces, markings on those surfaces are not permitted (e.g. valve covers are to be marked externally).

For parts involving software development, the hardware/software (HW/SW) status must always be indicated.

Parts for the PVS and for the pilot series must always be subjected to measurement. The measured values must be statistically recorded and evaluated. The evaluation reports must be submitted on a regular basis to the responsible line department. The line departments concerned will request the individual verification reports as required. Marking by adhesive label may be omitted when the pre-production phase is completed, following consultation with the part manager. For this, the initial sample test of the parts from production tooling/small-lot production tooling must have been passed with a mark of at least 3 for the producing location (supplier number, DUNS) and the parts must no longer be being delivered to the special warehouse.  

3.1.1.5 Quality verification for pre-production
The supplier must submit the "Quality verification for the pre-production phase" with every parts delivery in the pre-production phase to the special warehouse. All test specifications, standards and technical conditions of delivery stipulated on the drawing and/or in the requirements specification must be implemented by the supplier. Any reworking or non-conformance of key characteristics must be agreed with the responsible AUDI AG staff (e.g. from Technical Development or Quality Assurance). The

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4 For ongoing production and for customer support in the field, the part generation status should be a fixed component of the marking in addition to the part identification.
supplier’s quality verification must document any such agreements, including the name of the contact person at AUDI AG and the date. Quality verification for pre-production must end when pre-production is complete. For this, the initial sample test of the parts from production tooling/small-lot production tooling must have been passed with a mark of at least 3 from the producing location (supplier number, DUNS) and the parts must no longer be being delivered to the special warehouse.

3.1.1.6 Changes in production
The supplier is obliged to give notification of any changes subject to compulsory notification as set out in section 1.4.1 (see also section 3.5 Initial samples).

3.2 Important milestones for QPN maturity levels
Section 3.2 of Formula Q: Specifics applies without restriction.

3.3 Master jig harmonisation
From a period as early as two months prior to PVS, the respective current part states, including a complete measurement report (see also section 3.3.1) for assessment on the interior and exterior master jigs and on the functional cubes are to be independently submitted by the supplier following consultation with AUDI AG QA Product Technology/Production Purchased Parts. All parts fitted visibly in the vehicle interior and the associated fasteners are assessed on the interior master jig. The body and body mountings are assessed on the exterior master jig and function cubing.

The supplier is independently responsible for optimising and coordinating its delivered parts in terms of function, fit, look, feel, odour, free movement, process-safe assembly, user-friendliness (forces, noise...) and rigidity. The supplier coordinates optimisation items with its subcontractors.

A qualified contact person must be designated to participate regularly in the master jig review meetings and who is responsible for implementing the items agreed on the master jig.

For the master jig and cubing, the latest samples parts in two variants (colour and execution in consultation with Measuring Technology/Master Jig) must be permanently supplied. More than two parts may also be requested under certain circumstances.

3.3.1 Preconditions for master jig agreement
The key preconditions are:
- Parts from production/small-lot production tooling produced
- Parts with relevant marking
- Parts with relevant measurement protocol with:
  - Indication of attachment and reference points
  - Indication of connection and function contours
  - Verification of dimensional stability by target/actual comparison
  - Indication of alignment

The variations are depicted either in coordinates based on the mathematical preceding sign rule or in normal direction, in a view (+ too much on part, - too little on part). When depicting the contour connections, e.g. based on sectional views, it is necessary to scan the connection area sequencing and plot the target/actual comparison of data states 1:1.
The data for the measurement report must be appropriately prepared and graphically represented (sketches); columns of figures will not be accepted. The form of representation must be agreed in advance with AUDI AG QA Measuring Technology/Master Jigs.

3.3.2 Measurement supports and performance of measurements
The parts are to be measured once in their original fixing and once without tension. The reference point system (RPS) to VW 01055 must be observed. The positions and numbers of measuring points must be agreed prior to measurement with AUDI AG QA Measuring Technology/Master Jigs.

3.3.3 In-process measurement system (PBMS)
The PBMS measuring points stipulated by AUDI AG must be monitored by the supplier in production. Data is transferred to AUDI AG on a weekly basis, or in the case of JIT parts daily or as agreed with the responsible part manager. The method of data transfer should be selected according to Audi specification based on the QS-Stat descriptions. The measuring point designations and the positions of the coordinates must be defined according to Audi specification and will be determined in the test equipment design meeting. The recording and processing of measurement data must be fully electronic (no manual data exchange). Any non-conformance from this ruling in individual cases must be agreed with the responsible part manager from AUDI AG Quality Assurance prior to submitting quotations.

3.3.4 Data re-import
Following OK release by AUDI AG QA Measuring Technology/Master Jigs, the agreed data must be immediately re-imported into the CAD record/drawing of the responsible design department (supplier/customer).

3.3.5 Tool/part design
The tool deformability of parts with scarred surfaces (as per TE specification) is generally, and in the event of any change, to be checked in detail by the supplier. The tool separations are to be defined appropriate to the required look, feel and function and must be agreed in advance of tooling production in the course of SE work with Technical Development and Quality Assurance.
The grain release is issued in writing by AUDI AG QA-Product Technology/Production Purchased Parts in consultation with QA-Measuring Technology/Master Jigs, QA-Materials Engineering and Technical Development.

3.4 Process capability pre-production and in production
The requirements set out in section 4.1 of "Formula Q: Specifics" apply without restriction in this respect.

3.4.1 Supplementary process capability requirements
As a matter of principle, AUDI AG expects its supply chain to ensure a robust production process according to VDA standards.
The key quality characteristics defined for the product (relating to function, production and quality) must be marked accordingly in the drawing. The definition is usually made in the SE process, where appropriate with the aid of FMEAs and QFD analyses, in consultation between AUDI AG and the supplier. The key characteristics for which process capability analyses are to be carried out must be defined.
The supplier must define the operating conditions necessary for a zero-defect process and verify the capability of those processes. Then they must be described in the process control plan.

The continuous monitoring and verification of process capability for pre-determined key characteristics is based on the following limit values:

- Preliminary process capability \( P_{pk} \geq 1.67 \)
- Long-time process capability \( C_{pk} \geq 1.33 \) at start of PVS, with continuous improvement subsequently and targeting: \( C_{pk} \geq 1.67 \)

Determination of machine and process capability values must be based on VDA standard volume 4.1 and the Audi *Guideline for determining machine and process capability* (see also Referenced documents). Both short and long time capability must be determined and verified no later than by 2TP. 5

In this context, we refer to the applicable VW standards VW10119, VW 10130 and VW 10131, which set out a more practically oriented evaluation of the machine capability analysis and process capability for measurable characteristics. The test equipment capability should be verified according to the harmonised guideline of the European automotive industry on "Verification of capability of measurement systems". VW 10119 may be applied alternatively following consultation.

With regard to software or software-determining systems on-board the vehicle, requirements are based on LAH 893.909.A *Group software requirements*.

### 3.5 Initial samples

#### 3.5.1 Initial samples and release conditions

Initial samples are to be produced entirely with production equipment under production conditions, and must be submitted on schedule (deadline to be set by Purchasing) to AUDI AG QA-Product Technology/Production Purchased Parts by way of the BeOn online sampling system.

Necessary sampling for deliveries to AUDI AG is now only carried out online. Application of the BeOn system is compulsory for all new sample submissions. More details on its application and activation can be found on the B2B platform (www.vwgroupsupply.com).

Additional expenditure arising from incomplete delivery of the requested initial samples, sample documentation or delivery to the incorrect location or wrong unloading point will be billed to the supplier. The supplier must always notify the customer promptly of any delays.

All parts from production tooling must be delivered by VFF. By PVS, sampling of parts must be complete with a minimum score of 3. Incomplete documentation or failure to comply with technical specifications will result in rejection (score 6) of the initial sample test report. For parts with sample test results with a score of 3 and with a score of 6 repeat sample submission by the supplier is required. A grade 1 OK sample test result must have been attained by the pilot production stage.

At least five parts, accompanied by the relevant initial sample test report, must be submitted for initial sampling. The exact number of parts is to be agreed in advance with the responsible member of staff from AUDI AG QA-Product Technology/Purchased Parts.

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5 For statistical reporting AUDI AG QA recommends the qs-STAT program from Q-DAS GmbH & Co. KG (see Referenced documents).
Parts. On request, semi-finished goods/single parts of an assembly or supplied lot must also be submitted (this applies to the entire product life cycle).

Initial samples must be submitted (see also VW 01155) in the case of:

- new parts;
- any technical modification;
- new and/or modified production equipment, tooling/replacement tooling;
- modified process flows/procedures (internally or at subcontractors);
- relocation of production (internally or at subcontractors, or in case of new subcontractors);
- lengthy interruptions to production (> 1 year).

In case of doubt, the performance and scope of repeat sampling is to be clarified at an early stage with the responsible technical supervisor from AUDI AG QA-Product Technology/Purchased Parts (see also 3.1.1.6 Changes in production)

The sample production conditions must be documented. This forms the basis for analysis during the 2TP (see also 3.6 2-day production (2TP))

If the test results documented by the supplier in the initial sample test report are not confirmed in sample testing by AUDI AG, and if a sample test score of 3 or 6 is awarded as a result, the supplier will be billed for the testing costs incurred. If, in response to a score of 3 or 6, a process check by AUDI AG at the supplier's location is required, the costs thereby incurred by AUDI AG (such as travel expenses) can be billed to the supplier.

If all non-conformance to the technical documentation is disclosed and identified by the supplier, no charge will be made.

3.5.2 Content of the initial sample documentation

The initial sample documentation in the BeOn system must be complete. It includes:

- Completed initial sample test report cover sheet as per VDA volume 2.
- Indication of the production location with the relevant supplier number (with index) and DUNS number.
- Part history.
- The exact chemical composition of the materials used, with all constituents of all components via the IMDS as per VW 01155. This must be entered in the IMDS no later than one day before sampling, as an automatic cross-check against Audi stipulations is carried out overnight. The online sample submission can only be routinely forwarded to Audi if entries are accepted. As long as there is no material data accepted by AUDI AG in the IMDS, the initial sample is automatically assigned a score of 6. In this case repeat sample submission is compulsory. The IMDS input for complete parts and assemblies must be executed in accordance with the rules for file input in respect of complex parts and assemblies (see Referenced documents).
- EU safety data sheet in accordance with the Hazardous Substances Regulation relating to substances, preparations and products classified as such according to European hazardous substance law.
- For vehicle interior components made of non-metallic materials, the measured values must be transferred by a special file as per VW 50180 and VW 50179 (see Referenced documents). The results must originate from a laboratory accepted by Audi.
- Completed measurement report with drawing/sketch with marking of measuring points – no columns of figures! All non-conforming characteristics, e.g. dimensions out of tolerance or function test targets not met, must be agreed in advance with the responsible designer. The non-conformance to the technical documentation must be
identified by the supplier in the initial sample test report. Marking on the cover sheet, on a separate accompanying sheet or on the drawing by means of target/actual comparison (depiction of difference) possible. If a consent for non-conformance (AE) has been issued by Technical Development, it should be included.

- Complete test report on all single-part, function, material and surface tests etc.
- Verification of process capability for the defined key characteristics.
- When submitting sample assemblies the subcontractors involved must be specified. Full verification of part sampling by subcontractors must be provided. The said verification must accompany the sample documentation submitted to AUDI AG. When sampling assemblies with designated parts sampled with the support of AUDI AG (e.g. cloth/leather), full verification of the OK samples of designated parts must accompany the assembly sample documentation submitted to AUDI AG. On request from AUDI AG, the complete sample documentation from the supply chain is to be submitted to AUDI AG QA.

- The mass/weight of delivered parts/assemblies must always be indicated in grams per item (g/item).
- When submitting repeat samples, the part number with index of the previous status and the associated Audi test report number must be quoted on the cover sheet in the "Comments" box.

Other possible attachments are listed on the initial sample test report cover sheet to VDA and in the BeOn software tool.

The initial sample test report must always be agreed in advance with the responsible member of staff from AUDI AG QA-Product Technology/Purchased Parts. Preliminary samples/parts from small-lot production tooling must be submitted in the same way as those from production tooling and the generation status marked as K.

### 3.5.3 Address for delivery of initial samples:
Initial samples must be delivered for sampling on schedule, in the requested quantity, to the plant designated by AUDI AG Purchasing on the purchase order. The sample documentation must be complete in the BeOn system (see also 3.5.1, addresses are part number-specific in BeOn). The packing units for initial samples must be clearly labelled "Initial sample". The packing units and their labelling for laboratory, dimensional and installation testing samples and the like must be agreed with the responsible part manager.

### 3.6 2-day production (2TP)
To verify that the parts meet the qualitative and quantitative targets at product launch and in production, a 2TP is to be carried out before start of production. For this, the new parts training programme (QPN) must have been successfully completed in the LION (see 3.1.1.2 Part history/marking, quality verification for pre-production)

With regard to electrical/electronic components, assemblies and functional parts, the checklist "Requirements relating to the production and testing equipment for electrical and electronic component assemblies" (see Referenced documents) additionally forms part of the 2TP. This also applies likewise to other applicable checklists for specified product groups (e.g. coolant hoses).

The 2TP is to be conducted independently by the supplier with the LION-QPN online system and the result notified to AUDI AG QA-Product Technology/Purchased Parts. In respect of key parts as defined by AUDI AG (e.g. modules of complex components, units and assemblies) the responsible member of staff from QA-Product Technol-
ogy/Purchased Parts, where appropriate with the assistance of Technical Development, the QA laboratory, Purchasing and Disposition/Logistics, may carry out acceptance of the 2TP.

If serious weaknesses are detected in the 2TP, necessitating repetition, the costs of the repeat 2TP will be charged to the supplier.

Provided the target is met, release for mass production is issued by the responsible member of staff from AUDI AG QA-Product Technology/Purchased Parts.

3.7 Capacity changes in ongoing production
In the event of a significant increase or decrease relative to the originally planned production capacities (based on the nomination letter +15 %) a reassessment of the 2TP is necessary. The procedure must be agreed with the responsible part manager.

4. Series quality measures
4.1 Continuous guarantee of process capability
Section 4.1 of Formula Q: Specifics applies without restriction (see also section 3.4).

4.2 Product safety, product liability
Section 4.2 of Formula Q: Specifics applies without restriction.

4.3 Internal audits
Section 4.3 of Formula Q: Specifics applies without restriction.

4.3.1 Auditing, problem analysis and technical review of suppliers
If AUDI AG conducts an audit or problem analysis at a supplier because the quality requirements of AUDI AG are demonstrably not being met (e.g. in the case of field or 0-km complaints), the costs thereby incurred by AUDI AG may be billed to the supplier. The same also applies if a follow-up or repeat audit identifies that the improvement programme has not been implemented, or not been implemented adequately, and as a result the stipulated A-classification (≥92 %) is not attained.

If direct safeguards have to be stipulated when conducting a supplier technical review (TRL), or if the TRL is rated "Red", the travel expenses and other costs incurred by AUDI AG may be billed to the supplier (see also Formula Q: Capability).

4.4 Control circuits
4.4.1 Complaints manager
Section 4.4.1 of Formula Q: Specifics applies without restriction.

4.4.1.1 0-km complaints
Parts that have not been sampled must not be delivered into production without a limited-period release from Technical Development or Quality Assurance. Purchased parts subject to complaint are returned to the supplier promptly for troubleshooting and in order to shorten the analysis process and must be analysed without delay by the supplier. In respect of all fault causes, remedial measures must be de-
fined, scheduled, implemented and monitored in terms of their efficacy. This also includes the necessary measures at subcontractors.

To avoid repeat faults, each complaint must result in a revision of the process FMEA by the supplier and re-submission to AUDI AG Quality Assurance.

Complaints are handled by way of the shared online information and processing portal QTS / QDX. The technical supervisor in QA-Product Technology/Production Purchased Parts must be notified as soon as possible (< 24h) in writing by means of an 8-D Report (to be completed in German) of the measures taken. The 8-D Report must be concluded within the agreed or stipulated time frame. If the time frame cannot be met, the supplier must subsequently submit an interim report following agreement with QA. When a complaint is notified, the supplier must immediately agree the required analysis time (deadline) with the responsible technical supervisor at AUDI AG if the stipulated deadline cannot be met. If the handling of complaints relating to purchased parts (8-D Report) results in schedule delays not agreed with AUDI AG Quality Assurance, the 8-D Report will be concluded after four weeks, regardless of the causal factor, at the expense of the supplier.

In the event of 0-km defects in purchased parts for which the supplier is responsible, the costs incurred (including ancillary costs such as vehicle movement, parts handling, material movement, necessary analysis etc.) will be charged on to the supplier. The charge will be based on the applicable Quality performance costs 0-km (see Referenced documents).

Current ppm actual values for 0km are to be found in the QTS system and for the field in the monthly purchased part log (KTL) distributed to the suppliers by Commercial Claims. The KTL forms part of the notice of charge (BVA), described in the document entitled "Procedure for handling of non-conforming deliveries (field damage cases) between AUDI AG and the supplier" (www.vwgroupsupply.com).

The ppm rates agreed in the Nomination Letter are essentially binding, and are applied in supplier assessment. If the ppm targets are not met by existing production deliveries, the supplier must draw up an action plan to attain the Group's targets. Where appropriate, the supplier may be escalated into the "Critical suppliers" programme (see section 4.11).

At regular intervals, in consultation with AUDI AG Quality Assurance, quality reports are to be submitted on the current ppm figures.

Verification of delivered generation status and associated delivery notes must be submitted at any time on request. Standard documentation procedures must be executed online by way of the LION TGS module.

4.4.1.2 Reworking and sorting

If defects in purchased parts are detected by AUDI AG, the supplier must immediately (within 24 hours) provide technical support on-site in order to carry out necessary reworking or sorting. If more extensive complaints relating to purchased parts occur, AUDI AG QA may request the continuous presence of a supplier representative on-site (resident engineer) and require 100% incoming goods checking by the supplier until the defect has been verifiably eliminated.

AUDI AG runs its production in three shifts, seven days a week, and thus also operates regularly outside of normal business hours. If the supplier is unable to provide a resident engineer on-site service, this means that AUDI AG is unable to coordinate rapid response with the supplier.

In the event of complaints outside of normal business hours, AUDI AG Quality Assurance is therefore entitled to initiate the measures causing the least damage and to
charge on the costs thereby incurred, provided the supplier is informed at the start of normal business hours. This ruling also applies where fault on the part of the supplier can be proved and it fails to fulfil its obligation to provide remedy to the extent required. The other warranty provisions remain unaffected.

4.4.1.3 Field complaints
In respect of complaints relating to purchased parts from the field (customer complaints from the contract workshops) recorded in QTS, the supplier must ensure that the parts are analysed as soon as possible, the necessary measures are initiated and the efficacy of the measures taken is checked. This also includes the necessary measures at subcontractors.

To avoid repeat faults, each complaint must result in a revision of the process FMEA by the supplier and re-submission to AUDI AG Quality Assurance.

Supplementary to the coordination with the part manager, as from an NTF (No Trouble Found) rate of 30%, based on at least 15 defective parts per year, the supplier is obliged to initiate an NTF process as per the VDA standard governing analysis of defective parts in the field.

Complaints are handled by way of the shared online portal QTS / QDX. The technical supervisor in AUDI AG QA-Product Technology/Production Purchased Parts must be notified as soon as possible in writing by means of an 8-D Report (to be completed in German) of the measures taken. Further details of this process are to be found in the "Procedure for handling of non-conforming deliveries (field damage cases) between AUDI AG and the supplier".

4.4.2 Early warning system
Section 4.4.2 of Formula Q: Specifics applies without restriction.

4.4.3 Requirement for internal field testing with reporting obligations
Section 4.4.3 of Formula Q: Specifics applies without restriction.

4.4.3.1 Verification of field monitoring
All suppliers must be aware of how their products behave in use. The supplier must provide evidence of the activities undertaken to obtain information relating to the parts in use. To enable product monitoring by the supplier, the AUDI AG QTS online system is made available to the supplier in addition to the existing quality consultations. Moreover, the purchased part logs permit monthly tracking of global failure rates.

4.4.3.2 Long-time quality
In the usage phase of the part concerned (during the service life of the vehicle) the supplier actively participates in the AUDI AG troubleshooting process, unless the specified useful life is limited by contract (usually by way of the development specification, e.g. for wearing parts such as brake pads or wiper blades).

For COP-relevant parts (subject to globally applicable legislation) the supplier must independently carry out testing (see also 3.1.1.1.). These tests must be documented accordingly and the test results submitted to the COP contact personnel at AUDI AG (see also referenced document: "List of COP contacts at AUDI AG").
4.5 Continuous improvement process (KVP)
Section 4.5 of Formula Q: Specifics applies without restriction.

4.5.1 In-production quality assurance
The supplier must ensure, and document, the conformance of the parts it supplies to the specified requirements (e.g. dimensional stability, paintwork adhesion) during production. Evidence must be furnished to AUDI AG on request. The scope and frequency of measurement and mode of verification must be agreed with AUDI AG Quality Assurance.

4.6 Change management
Section 4.6 of Formula Q: Specifics applies without restriction.

4.7 Requalification
Section 4.7 of Formula Q: Specifics applies without restriction.

4.7.1. Verification
Checking and verification as per ISO TS 16949, section 8.2.4.1, must be carried out at least once every three years, unless otherwise stipulated in component requirements specifications.

4.8 Lessons learned
Section 4.8 of Formula Q: Specifics applies without restriction.

4.9 Additional costs incurred due to discrepancies
Section 4.9 applies in conjunction with the referenced documents Quality performance costs 0-km and the Procedure for handling of non-conforming deliveries (field damage cases) between AUDI AG and the supplier.

4.10 Technical review of suppliers (TRL)
Section 4.10 of Formula Q: Specifics applies without restriction.

4.11 "Critical approved suppliers" programme
Section 4.11 of Formula Q: Specifics applies without restriction.

4.12 Media
To ensure rapid, problem-oriented handling, and to improve communications and information exchange, the appropriate media resources must be provided (non-personal e-mail address with encryption facility based on the open-PGP standard; connection to the system interfaces cited under 1.1.1). A video conferencing system to international standard, e.g. H.320, T.120, may be specified by AUDI AG where necessary.

4.13 External service providers
All systems required for analysis must be available at the supplier's facility. In exceptional cases, external service providers (universities, scientific institutions, external laboratories) may also be engaged for problem analysis. Such external service providers
must posses a valid accreditation to ISO/IEC 17025:2000 for their specific activities or be approved for the purpose by AUDI AG. The supplier is responsible for furnishing the relevant verification to AUDI AG.
The external service providers intended to be consulted for handling of problems must be notified to AUDI AG at project kick-off.
Evidence must be furnished that the necessary capacities are available. The supplier must ensure that employees of AUDI AG or its representatives are provided with access to the premises of the selected service providers during normal business hours when so required in order to deal with problems. In the event of danger they must be permitted access at all times.
**Terms and abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AE</td>
<td>Permission of deviation</td>
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<tr>
<td>Customer-supplied products/parts</td>
<td>Parts/components/products provided by Audi/Volkswagen to the supplier for further processing/finishing at an agreed rate or free of charge.</td>
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<tr>
<td>BeOn</td>
<td>Online sampling system</td>
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<tr>
<td>BMG</td>
<td>Type approval</td>
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<tr>
<td>BTV/TV</td>
<td>Part manager/Technical supervisor at AUDI AG, person in charge of AUDI AG for certain component/product</td>
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<tr>
<td>CAD</td>
<td>Computer Aided Design</td>
</tr>
<tr>
<td>C&lt;sub&gt;mk&lt;/sub&gt;</td>
<td>Machine Capability. Machine capability index taking account of position</td>
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<tr>
<td>COP</td>
<td>Conformity Of Production</td>
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<td>EMPB</td>
<td>Initial sample test report</td>
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<td>Gen.</td>
<td>Generation status</td>
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<tr>
<td>HW / SW</td>
<td>Hardware / Software</td>
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<tr>
<td>OK</td>
<td>In good order</td>
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<tr>
<td>Supply chain</td>
<td>The supply chain comprises all planned and implemented</td>
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<tr>
<td>NTF</td>
<td>No Trouble Found (VDA standard on analysis of defective parts in the field)</td>
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<tr>
<td>P&lt;sub&gt;pk&lt;/sub&gt;</td>
<td>Preliminary Capability. Preliminary process capability taking account of position</td>
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<td>ppm</td>
<td>Parts per Million. Indicates the ratio of defective parts referred to 1 million delivered parts within a defined period.</td>
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<tr>
<td>QDX</td>
<td>Quality Data Exchange (VDA standard for online data exchange for 0km / field)</td>
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<td>QFD</td>
<td>Quality Function Deployment</td>
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<tr>
<td>QPN</td>
<td>Qualification programme for new parts / Formula Q- New parts integral</td>
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<td>QA</td>
<td>Quality Assurance</td>
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<td>QTS</td>
<td>Quality data information and processing system</td>
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<td>RPS</td>
<td>Reference Point System</td>
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<tr>
<td>SE</td>
<td>Simultaneous Engineering (group of representatives of various divisions involved in the product creation process)</td>
</tr>
<tr>
<td>Designated parts</td>
<td>Parts defined by Audi/Volkswagen as single parts or assemblies with annual purchase quantities and prices within a framework contract with third-party suppliers but which are bought and scheduled for use by the system/module supplier. Designated parts are to be sampled and released by the system/module supplier's assembly manager. The sources of designated parts are dictated to the supplier by the Procurement department.</td>
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<tr>
<td>TL</td>
<td>Technical specifications of delivery</td>
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<tr>
<td>TLD</td>
<td>Technical guideline for documentation</td>
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<tr>
<td>VDA</td>
<td>Verband der Automobilindustrie e.V. (German Automotive Industry Association)</td>
</tr>
<tr>
<td>VFF</td>
<td>Pre-production release vehicles: parts with production tooling prior to PVS</td>
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<tr>
<td>ZSB</td>
<td>Assemblies</td>
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For definitions of more terms see Formula Q: Specifics.