The Drive & Control Company

Rexroth
Bosch Group

Supplier Quality Management Process

Good-Practice-Manual for Suppliers and Stakeholders

Preface

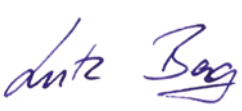
Quality is a key ingredient for success for the Rexroth brand.
This is because in the industries that we supply, customers and their end users have high expectations of our products.

Our target is to satisfy the expectations of our customers with “Best-in-Class” quality!

The early involvement of suppliers and the intensive cooperation already during the Product Engineering Process (PEP) before the series production plays an important role in order to achieve outstanding quality in the entire value stream for products and processes.

For several years we embarked on the path in a quality partnership with suppliers which is based on open communication. For this reason we are confident that we remain jointly successful on the market. This is also shown due to the exemplary developed key performance indicators of suppliers, who already work according to the new processes intensively.

„Number-One-in-Quality“ requires courage, discipline and consistency from all of us.

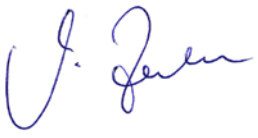


DC/PU
Head of Purchasing
Lutz Berg

This Good-Practice-Manual describes comprehensibly the most important aspects of this quality framework. First, the manual provides information on our “Supplier Quality Management Process” (SQM), and, second, you will find guidelines to which we expect compliance from our suppliers and employees to the same degree.

We have defined the nature of reliable processes between Bosch Rexroth and its suppliers and what methods must be adopted to guarantee long-lasting quality.

Suppliers in our quality partnership understand this and they actively practice the process for implementation and continuous improvement.



DC/PUQ
Head of Purchasing Quality Management
Manfred Zerbe

Aim
This Good-Practice Manual defines the tasks for the co-operation between Bosch Rexroth and its suppliers in respect to quality assurance for products (products, raw materials and trade goods) and from the selection of suitable suppliers to the monitoring and improvement in the series production.

Application area
The Good-Practice Manual is applied to projects and processes in the supply management between Bosch Rexroth AG, its subsidiaries, and the respective suppliers.

Responsibility
Purchasing quality management is responsible for the content and management of this manual.
All Bosch Rexroth business units contribute to the development and improvement of this manual.

Short description
The Bosch Rexroth Supplier Quality Management Process describes the following procedures:

- Selection of suppliers and their qualification
- Quality development & engineering with suppliers and quality performance contracts
- Initial sample inspection and parts approval
- Series production, series delivery and change management
- Key performance evaluation and targeting process, as well as in case of deviations from Bosch Rexroth requirements
- Feedback on all phases of process and continuous improvement

SQM Process Description and Details

DCCD 08016-41
Supplier selection

DCCD 08016-43
Contracting & parts release

DCCD 08016-42
Qualification, enabling and development of suppliers

Planning & Preparation

Engineering & Contracting*

Parts & Process Approval

Supplier approved for RfQ

Technical Sourcing Review

Feasibility Confirmation Supplier

- Certificate Checking
- Q-System accepted (QAA)
- Supplier evaluation
- Requirement profile product, material
- Q-Targets:
  - incidents/mio_p
  - ppm
  - initial sample recursions

QB0

- Key Product Characteristics **GPc 3**
- Lessons learned **GPc 5**
- Supplier Quality Plan SQP **GPc 6**
- Specification up-to-date & complete **GPc 7**
- TSR **GPc 8**
- Feasibility Confirmation **GPc 9**
- Contracting
- FMEA
- Inspection plan **GPc 10**
- Design validated

QB1

QB2

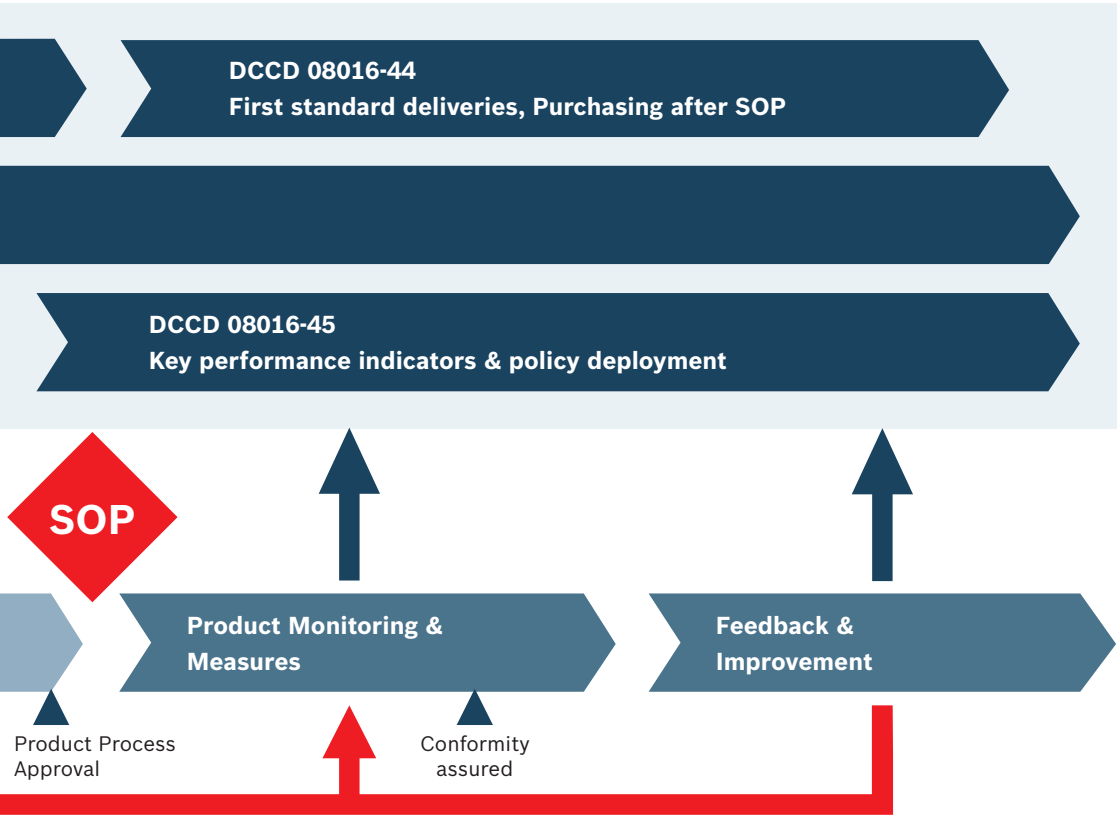
Parts release:

- Initial sample inspection (ISIR Point CIP) **GPc 12**
- Installation test (fit, form, function)

Process release:

- System validation
- Product Process Approval (PPAP on customer request) **GPc 16**
- Ramp-up (Run@Rate for automotive industry on customer request) **GPc 20**

QB3



Internal central department directives (DCCD) outline all phases of the Procurement Process. The main goal is to most effectively support development activities and continuous product improvement throughout the life-cycle of the product.

QB4

- Parts inspection
- SPC
- Target and key performance tracking (Incidents/mio_p, ppm, PUE ppm, initial sample recursions) **GPc 17 and 18**
- SRM (Supplier Relationship Management)
- Claims management 8D-Reports incl. assessments
- Early warning systems (Q-Alert)

QB5

- Process audit
- Supplier Development
- Awards
- Quality Programs (Q focus program, supplier learning factory)
- Change request (ECR) **GPc 23**
- CIP
- Process improvement review **GPc 21**

QBs are linked to Product Engineering Process PEP

To optimize cooperation with suppliers, important deliverables are described as Good Practices. The focus of these **“GPc’s”** is prevention through joint reviews with suppliers. They are continuously revised and updated, if necessary.

* Based on the project targets and customer requirements

Typical Customer Requirements

- Zero-defect target
- Safety stock, ability to supply and capacity consent
- Validation of key product characteristics
- PEP in reconciliation with customer (e.g. PPAP)
- Ship-to-line concepts
- Close control of processes at supplier
- Processing of complaints according to 8D method
- Take over external failure costs
- Management System (e.g. ISO 9001)
- Efficient escalation processes

Quality expectations for our suppliers

Incoming Inspection

- Optimized quality assurance measures and inspections at supplier
- Avoid double-work without compromising quality
- Target: Ship-to-stock / Ship-to-line
- If failures occur: 8D with root cause analysis (technical/managerial)

Initial Samples

- Initial samples are perfect – avoid recursions
- Supplier self-declaration of part conformity (warrant): confirmation, all requirements fulfilled
- Use part family releases instead of single ISIR
- No need for DC to confirm dimensions submitted by a supplier (establish trust)

Capability and Audits

- Self-driven measures for continuous improvement and control plans
- 8D failure cluster analysis
- Process capabilities, process reviews, sustainable failure prevention
- Use 3rd party audits to improve your processes

We expect that our suppliers take initiative!

Overview Good Practices “GPc”

Key Product Characteristics	GPc 3
Lessons Learned Similar Products and Projects	GPc 5
Supplier Quality Plan (SQP) – Quality Planning during Procurement	GPc 6
Specification up-to-date & complete	GPc 7
Technical Sourcing Review (TSR)	GPc 8
Feasibility Confirmation of Supplier	GPc 9
Inspection planning	GPc 10
Initial sample inspection	GPc 12
Production Process Approval – (PPAP on customer request)	GPc 16
Key Performance Indication and Policy Deployment – out of preventive Quality Assurance	GPc 17
Key Performance Indication and Policy Deployment – after SOP	GPc 18
Safe Launch: Risk Management for New Suppliers, Material/Technologies	GPc 20
Auditing of suppliers	GPc 21
Sub-Supplier Quality Management	GPc 22
ECR in Purchasing	GPc 23

Note:
• GPc available in SOCOS at 07416-XXX (http://inside.bosch.com/alias/dc/gpc-manual-EN)

GPc 3 Key Product Characteristics

Task Owner	Development
1. Description	Product characteristics or production process parameter which effect safety, compliance of official regulations, correct fit, form, function or further processing are “Key Product Characteristics”. These are identified by R&D Department. Suppliers considers these in his manufacturing processes.
2. Result	Key Product Characteristics are documented and clearly marked in drawings or specifications as reference for validation and part release (e.g. critical characteristics).
3. Area of application	Drawing related parts and components. SQP Scope 2 & 3
4. Due date	Definition prior to RfQ. Verification of the process control measures to insure KPC‘s during ISIR, FMEA or process audit resp. process approval (GPc 16).

5. Possible input

Possible input:	Responsible for input:	Reference:
▶ Check list DCGP 3	Project Purchasing, Development, Purchasing Quality	
▶ Up-to-date drawings (incl. Key Product Characteristics), parts lists, material specifications	Development	
▶ Specifications under consideration of standards and regulations	Development	
▶ Lessons learned, complaint book of similar products (end of line, 0-km, field)	Project Purchasing, Supplier	
▶ Product characteristics	Development, Supplier	
▶ Critical failure mode from D-FMEA	Development	

6. Method

- Potential Key Product Characteristics are identified and documented by development at Design FMEA
- Technical purchasing provides the supplier drawings incl. Key Product Characteristics as well as failure mode and impacts (from Design FMEA) as part of RfQ
- Supplier verifies feasibility of process control
- Supplier conducts Process FMEA
- Supplier implements appropriate measures to ensure Key Product Characteristics into manufacturing process after discussion with Bosch Rexroth (generally project purchasing)
- Supplier verifies consideration of KPC´s during ISIR and Process Approval (GPc 16), contracting and parts release

Other valid regulations

- CDQ0306
- DCCD 08016-43
- DCCD 08914-1
- DCCD 08914-2

GPc 5

Lessons Learned
Similar Products and Projects

Task Owner	Project Purchasing
1. Description	Analysis of all internal or external defects and weak points based on a complaint list including possible counter measures. Implementation of counter measures in new processes.
2. Result	Production and logistics are able to address existing and potential failures through preventive action. Feedback for new developments and continuous improvement for existing parts is communicated to development and manufacturing planning.
3. Area of application	Drawing related parts and components, SQP Scope 2 & 3
4. Due date	At Technical Sourcing Review (QB2), latest before series tool release or Process FMEA.

5. Possible input

Possible input:	Responsible for input:	Reference:
▶ Defects and weak points at manufacturing process (QAM)	Manufacturing/Assembly	
▶ Process FMEA or audits	Manufacturing/Assembly PUQ Techn. Service	
▶ Complaint list (internal & external)	Quality, Supplier, Purch. Q-Mgmt., Manufacturing/Assembly	
▶ 8D Report	Manufacturing/Assembly, Purchasing Quality Mgmt.	
▶ Work instructions for production	Manufacturing/Assembly, internal	
▶ Inspection plan	Internal, Supplier	
▶ Parts validation results	Development	

6. Method

- ▶ Analysis of main faults in production (manufacturing/assembly)
- ▶ Possible failures and corrective actions from QAM or 8D Report to be considered
- ▶ Complaint list of faults and corrective actions to be completed
- ▶ Checking current production status by means of additional parts sampling is also possible
- ▶ Process FMEA to be completed
- ▶ Prepare a ‘Lessons learned check list’ for external use
- ▶ Transfer to supplier for consideration in his process planning and confirmation of feasibility (GPc 9)
- ▶ Lessons learned to be part of supplier employee training and work instructions
- ▶ Inspection plan to be updated
- ▶ Supplier implements counter measures latest before Process Approval (GPc 16)

Other valid regulations

- ▶ CDQ0517
- ▶ DCCD 08958
- ▶ DCCD 08016-43

GPc 6

Supplier Quality Plan (SQP) – Quality Planning during Procurement

Task Owner	Project Purchasing
1. Description	Time table of sourcing process including all quality related deliverables and responsibilities. Monitoring of deviation. The SQP has to be in line with the overall project schedule.
2. Result	All necessary actions until SOP are known and scheduled. Responsibilities are defined. Binding resource planning.
3. Area of application	For all parts (drawing related parts and components, catalogue and company standard parts). SQP Scope 1 - 3
4. Due date	Draft after project start (QB1). Detailed SQP after TSR (Technical Sourcing Review), before initial sample order.

5. Possible Input

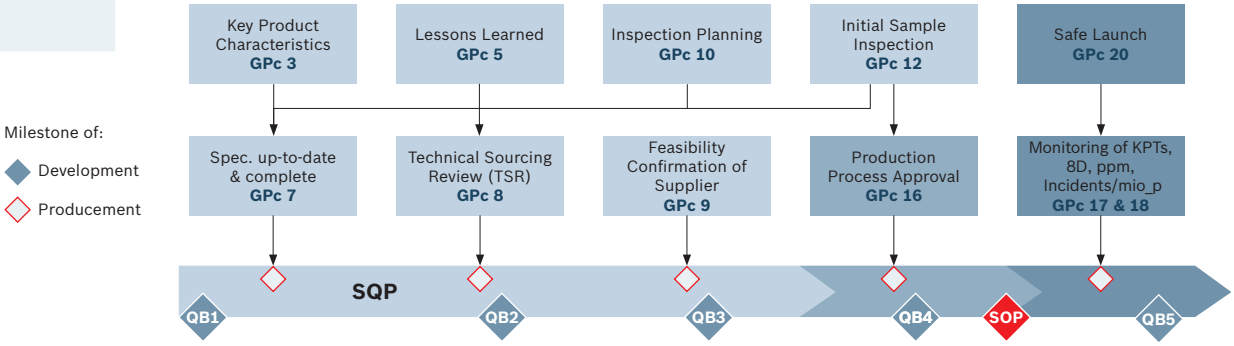
Possible input:	Responsible for input:	Reference:
▶ SQP master document	Project Purchasing	Appendix GPc 6
▶ Project schedules	Project Leader	
▶ Up-to-date drawings (incl. Key Product Characteristics), Bills of Material (BOM), material specifications	Development	
▶ Decision of SQP Scope 1 - 3	Project Purchasing & Development	
▶ Technical requirements, specifications (incl. prototype tests)	Development, Project Leader	
▶ Validation plan / approval plan	Development, Project Leader	
▶ Responsibilities of project team members	Project Leader	
▶ LPA	Commodity Purchasing	

6. Method

- ▶ Project Purchasing, PUQ Technical Services and development decide SQP Scope for components
- ▶ DIN, standard parts and assemblies (all single parts released) are SQP Scope 1
- ▶ In case of SQP Scope 3 collaboration of PUQ Technical Services is required (contracting)
- ▶ Adopt SQP master document based on sourcing process details such as specifications, validation plan, LPA results and parts release
- ▶ Propose back scheduling based on project / sub-project plan
- ▶ Propose responsible person for each task in SQP
- ▶ Overall resource planning and request for additional capacity if required
- ▶ Responsible persons to confirm task deadlines of SQP (incl. supplier)
- ▶ Monitor and update SQP
- ▶ Set up action plan in case of deviations from project plan

Other valid regulations

- ▶ DCCD 08016-43



GPc 7 Specification up-to-date & complete

Task Owner	Project Purchasing
1. Description	The check list ensures that RfQ package contains all required documents and these are up-to-date and complete. The responsible purchaser decides when and which documents have to be delivered to supplier.
2. Result	Specification up-to-date and complete for RfQ. Prioritized document delivery process for inquiry.
3. Area of application	All requests for quotation (RfQ). SQP Scope 1 - 3
4. Due date	Start RfQ, but not later than Technical Sourcing Review (TSR).

5. Possible Input

Possible input:	Responsible for input:	Reference:
▶ Check list GPc 7	Project Purchasing	Appendix GPc 7
▶ Specification for process / parts release (ISIR) GPc 12	Project Purchasing, Purchasing Quality Mgmt. Plant	
▶ Up-to-date drawings (incl. Key Product Characteristics), Bills of Material (BOM), material specifications, maximum storage periods, consideration of prohibited substances and declarable materials	Development	
▶ Description of Key Product Characteristics	Development	
▶ Common and Bosch Rexroth Standards	Development	
▶ Technical specification, specifications (incl. prototype tests)	Development, Head of Project	
▶ Specification for delivery and local/global packaging (Logistic specification)	Logistics	
▶ Legal regulations	Legal department	

6. Method

- ▶ Based on the check list, project purchasing gathers required RfQ specifications
- ▶ Check whether project effects Bosch Rexroth key competencies or involves critical parts. Discuss with management
- ▶ Decision to be made when and which documents have to be delivered to supplier
- ▶ Long-term suppliers do not have to get entire specification package (Attention: make sure specifications are up-to-date)
- ▶ Responsible departments ensure that documents, specifications and information is available

Other valid regulations

- ▶ DCCD 08016-43
- ▶ CD 03802 (N2580)

GPc 8 Technical Sourcing Review (TSR)

Task Owner	Project Purchasing
1. Description	Technical review of all issues arising out of inquiry and quotation which are relevant to the feasibility of process, technology, quality, logistics, deadlines and costs. TSR is the final review at the end of RFQ procedure. TSR identifies risks of parts, processes or potential difficulties at supplier (and its sub-suppliers) for escalation to project management.
2. Result	Quotation is understood. Supplier realizes specifications and Key Product Characteristics (KPC). Risks in the supplier's (and its sub-suppliers) process are indicated. Supplier can be recommended for nomination.
3. Area of application	Drawing related parts and components. TSR will be conducted only if supplier has high potential for nomination. TSR normally coincide with feasibility confirmation of supplier in case of parts already validated. SQP Scope 2 & 3
4. Due date	The TSR takes place at the end of RFQ process.

5. Possible Input

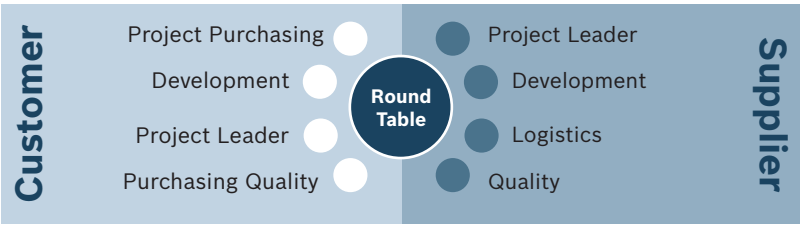
Possible input:	Responsible for input:	Reference:
▶ Check list GPc 8/9	Project Purchasing, Logistics, Development, Purch. Quality Mgmt.	Appendix GPc 8/9
▶ Quotation drawings, potential solutions	Supplier (Development)	
▶ Quotation	Supplier	
▶ Preliminary BOM	Development, Project Leader	
▶ Logistical and technical requirements, specifications (incl. prototype tests)	Logistics, Development, Project Leader	
▶ (Preliminary) validation plan / qualification test plan	Development, Project Leader	
▶ Feasibility studies of processes	Supplier (Production)	
▶ Lessons learned, complaint book of similar products (end of line, 0-km, field)	Project Purchasing, Supplier	
▶ Parts planning from prototype to initial sample	Project Purchasing, Purch. Quality Mgmt. Plant	
▶ Feasibility confirmation KPC of similar products	Supplier (Quality), Purchasing Quality	

6. Method

- ▶ Project purchasing initiates TSR with supplier, Purch. Quality Mgmt. Plant and Techn. Services, if necessary), logistics, development and manufacturing (relocation internal to external)
- ▶ Supplier presents quotation and potential technologies to fulfill required specification
- ▶ All Key Product Characteristics and lessons learned gained from previous projects are defined
- ▶ Compare product-specific requirements and KPC's with supplier's solutions
- ▶ Evaluate potential risks - counter measures to be defined and escalated to Project Review (QB2)
- ▶ Important agreements resulting from TSR may become part of the QAA

Other valid regulations

- ▶ DCCD 08016-43



Only a possible selection of participants. Group of participants might be extended by other special departments.

GPc 9 Feasibility Confirmation of Supplier

Task Owner	Project Purchasing
1. Description	Examine feasibility of customer requirements or validated product specifications together with the supplier.
2. Result	Supplier confirms process capability and fulfillment of commercial requirements and Key Product Characteristics (KPC). Use of Process FMEA if requested. Q-Problems of similar parts (lessons learned) are considered. Potential risks are addressed. Process limits are defined.
3. Area of application	Drawing related parts and components. SQP Scope 2 & 3
4. Due date	During or subsequent to Technical Sourcing Review (TSR). But latest prior to the release of series tooling and manufacturing facilities.

5. Possible Input

Possible input:	Responsible for input:	Reference:
▶ Check list GPc 7	Project Purchasing	Appendix GPc 7
▶ Check list GPc 8/9	Project Purchasing, Logistics, Development, Purch. Quality Mgmt.	Appendix GPc 8/9
▶ Up-to-date drawings (incl. KPC), Bills of Material (BOM), material specifications	Development	
▶ Technical requirements, specifications (incl. prototype tests)	Development, Project Leader	
▶ Quotation price and delivery-on-call planning	Project Purchasing	
▶ Contracting with suppliers (SE, corporate agreement, QAA)	Commodity Purchasing	
▶ Process FMEA	Supplier (Quality)	
▶ Logistics specification (incl. packaging instructions)	Logistics	
▶ Specific release requests (e.g. PPAP)	Project Leader	
▶ Validation plan / approval plan	Development	

6. Method

- ▶ Purchasing initiates the feasibility review with the supplier
- ▶ If a complete validated solution is available, TSR and Feasibility Confirmation coincides
- ▶ Purch. Quality Mgmt. (plant and if necessary Techn. Services), development, purchasing, logistics, if necessary manufacturing (at relocations internal to external) and supplier discuss specifications, KPC, validated solution and the manufacturing process
- ▶ Feasibility of specifications and KPC to be documented
- ▶ Risks are assessed and addressed with a capable process. No critical issues in Process FMEA
- ▶ Identify process limits and confirm inspection equipments and methods for capable process
- ▶ Supplier signs the Feasibility Confirmation check list

Other valid regulations

- ▶ GPc 8 Technical Sourcing Review (TSR)
- ▶ DCCD 08016-43

GPc 10 Inspection Planning

Task Owner	Project Purchasing
1. Description	Planning and definition of incoming inspections for sample and serial parts, if applicable including test equipment procurement
2. Result	Required testing capacity, test methods, characteristics, test positions on the part, sample size and test frequency determined. Test equipment is available before delivery of the initial samples and ready to use (incl. test equipment capability examination). Testing (test methods, characteristics) is agreed upon with the supplier.
3. Area of application	Drawing related parts and components. SQP Scope 1 to 3
4. Due date	Before initial sample production, at the latest before delivery of initial samples.

5. Possible Input

Possible input:	Responsible for input:	Reference:
▶ Check list GPc 3	Project Purchasing, Development, Purch. Quality Mgmt.	
▶ Check list GPc 12	Project Purchasing	
▶ OPL out of TSR, with reference to Key Product Characteristics	Project Purchasing, Supplier	
▶ Up-to-date drawings (incl. Key Product Characteristics), Bills of Material (BOM), material specifications	Development	
▶ Specifications, standards, regulations, test specifications, customer requirements	Development	
▶ FMEA´s (Design, Process)	Development, Supplier	
▶ Lessons learned, complaint book (end of line, 0-km, field) and incoming inspections of similar products	Project purchasing, Supplier, Purch. Quality Mgmt. Plant	

6. Method

- ▶ Internal coordination of inspection method and inspection characteristics for preparation to the TSR, between Project Purchasing, Development and Purch. Quality Mgmt. Plant, if applicable amended by specialist department
- ▶ Creation of Q information package in the system (e.g. SAP) by Project Purchasing
- ▶ Determination of test method, characteristics and frequency (dynamisation rule) between Project Purchasing, Purch. Quality Mgmt. Plant and the supplier considering the checklists GPc 3 and 12 as well as the specification out of the TSR
- ▶ Creation of inspection plan in the system (e.g. SAP) by Purch. Quality Mgmt. Plant
  For every inspection characteristic the following questions need to be answered:
  – What needs to be checked? (Determination of test characteristics)
  – How much needs to be checked? (Determination of test extend)
  – How often needs to be checked? (Determination of frequency of testing)
  – Check needs to be carried out using what? (Determination of test equipment)
  – How needs to be checked? (Determination of type/method of test)
  – When needs to be checked? (Determination of test time)
  – Who needs to check? (Determination of test personnel)
  – Where needs to be checked? (Determination of test location)
  – How to provide evidence? (Determination of record)
- ▶ After SOP the maintenance and adaptation of the (serial) inspection plans is carried out by Purch. Quality Mgmt. Plant

Other valid regulations

- ▶ CDQ0402
- ▶ DCCD 08016-43

GPc 12 Initial Sample Inspection

Task Owner	Project Purchasing
1. Description	Initial sampling is one of the series production release preconditions. Initial samples are manufactured with serial production equipment under serial conditions, i.e. initial samples are representative for series production according to respective revision level.
2. Result	Proof of conformity to the drawings and specifications, of parts and components, as one of the series production release preconditions.
3. Area of application	For all drawing related parts an components, catalogue parts, company standard parts. SQP Scope 1 - 3
4. Due date	Release type and scope defined before RfQ. Initial sampling can be carried out during the process approval (before function/endurance tests), however it must be completed before DC-Initial sampling with the customer.

5. Possible Input

Possible input:	Responsible for input:	Reference:
▶ Check list GPc 12	Project Purchasing	
▶ Customer requirements for release	Sales	
▶ Up-to-date drawings (incl. Key Product Characteristics), Bills of Material (BOM), material specifications	Development	
▶ OPL out of TSR, with reference to Key Product Characteristics	Project Purchasing, Supplier	
▶ SQP	Project Purchasing	
▶ Initial sample inspection plan	Purch. Quality Mgmt. Plant, Project Purchasing, Development	
▶ Production Process Approval	Project Purchasing, PUQ Techn. Services, Supplier	
▶ Initial sample documentation, initial sample parts	Supplier	

6. Method

- ▶ Extent of initial sampling defined by project team or during the ISIR Point CIP with check list GPc 12
- ▶ Send initial sampling extent to supplier with RfQ
- ▶ Initial sampling details are discussed with supplier via check list during TSR
- ▶ Discussion of initial sample report and serial inspection plan with operating department
- ▶ Information project purchasing to Purch. Quality Mgmt. Plant, for consideration of Key Product Characteristics out of technical discussions with supplier
- ▶ Project purchasing orders initial sample according to check list GPc 12
- ▶ Performance Production Process Approval (PPAP on customer request), according to decision (SQP)
- ▶ Supplier delivers initial samples, incl. manufacturer´s or sub-supplier marking, together with initial sample documentation according to purchasing order. In particular cases initial sampling and productions process approval may be carried out on-site
- ▶ Cross-check initial sample delivery. If reliability of supplier is proven, the sampling extent of the supplier may be reduced and/or DC may abstain partly or completely from cross-checking the initial sample test report (initial sample submission level)
- ▶ Respective release process owner summarises initial sample inspection results as one of the series production release preconditions

Other valid regulations

- ▶ DCCD 08016-43

GPc 16 Production Process Approval – (PPAP on customer request)

Task Owner

Project Purchasing

1. Description

Examination of production and inspection processes and associated documentation based on product specification to release series production. Review all documentation, open points lists, audit reports, FMEA etc. If a supplier assigns a sub-supplier to produce a product (partly or complete production) the supplier is committed to maintain an efficient sub-supplier-management and to carry out resp. permute the production process approval described in this document for all processes and sub-processes involved in production correspondingly (incl. supplier and parts release). Start of initial sample inspection at Bosch Rexroth starts, if all significant open points out of the production process approval resp. the process audit are finalized.

2. Result

Series process is stable, validated and controlled. Supplier is able/prepared to deliver products and components on call, according to the agreed specifications.

3. Area of application

Drawing related parts and components. SQP Scope 3

4. Due date

- Before or simultaneous to start of initial sample production at the supplier (prior QB4)
- In case of process changes, relocation and tool maintenances/changes etc.

5. Possible Input

Possible input:	Responsible for input:	Reference:
▶ Check list GPc 16	Project Purchasing	
▶ OPL out of TSR, with reference to Key Product Characteristics	Project Purchasing, Supplier	
▶ Technical requirements, specifications	Development, Project Leader	
▶ Quality agreements (QAA, delivery specification)	Project Purchasing, Supplier	
▶ Design FMEA	Development	
▶ Process FMEA / Process plan	Supplier	
▶ Test equipment and machine capability	Supplier	
▶ Tool release documents	Supplier	
▶ Information about changes in process, location, supplier, material, design and tool	Supplier	
▶ Contingency plan	Supplier	
▶ SQP checklist of open issues	Project Purchasing	
▶ Logistics concept	LOG, Supplier	

6. Method

- Supplier informs Bosch Rexroth after series production process is stable in place or in case of process change
- Bosch Rexroth decides whether to approve production process on site
- Verification of the required process release documents (e.g. FMEA, tool release, process capability study, maintenance schedules, contingency plan etc.)
- Monitor implementation of agreed measures and issues from FMEA, audit report etc.
- Monitor efficiency of counter measures from preproduction and lessons learned
- Employee-qualification-matrix must be available - trainings have to be finished
- Control plan in running series production (measuring and test equipment, inspection criteria, method and cycle)
- Examine packaging – container and handling (avoid damage during transport, pollution, humidity etc. – all required characteristics such as bar code, serial number, notation etc. are available
- Check if regular audit may be carried out with supplier visit (e.g. N93A12)
- Emergency concept

Other valid regulations

- CD 03802 (N2580)
- CD 82300 (B1.300)
- DCCD 08016-43
- DCCD 08993 (N93A12)

GPc 17

Key Performance Indication and Policy Deployment – out of preventive Quality Assurance

Task Owner	Project purchasing
1. Description	Regular quality evaluation and tracking of measures for new projects and specific analysis of potential disturbances for defined period.
2. Result	Evaluation of VQS work of project purchasing by analysing and evaluating the adherence of SQP milestones and the quality situation of SOP
3. Area of application	Development, second-source, relocation, ratio and change projects. SQP Scope 1 - 3
4. Due date	Ongoing from start of SQP resp. for a defined period (e.g. 12 months after SOP)

5. Possible Input

Possible input:	Responsible for input:	Reference:
▶ Number of initial sample recursions in the course of the initial sample release process	Project Purchasing, Purch. Quality Mgmt. Plant	
▶ SQP milestone	Project Purchasing	
▶ All completed and pending complaints (notice of defects) from development, good receipt, manufacturing and if applicable customers	Supplier, Purchasing Purch. Quality Mgmt. Plant, Development	
▶ Trend analysis, statistical evaluation (initial sample recursions, PUE ppm, incidents/mio_p, failure costs, concessions)	Project Purchasing, Purch. Quality Mgmt. Plant, Controlling	

6. Method

- ▶ Analysis of cause of initial sample recursions during sampling process and introduction of measures
- ▶ Transfer of product specific know how to PUQ Technical Service
- ▶ Ongoing evaluation of Q key performance indicators (initial sample recursions, PUE ppm and incidents/mio_p) and number of concessions, for alignment of strategy with development and commodity purchasing
- ▶ Exceeding of SQP milestones are analysed regarding cause and initialization of measures
- ▶ Monitoring number of complaints after SOP (ramp-up phase) and immediate introduction of optimization measures in case of increased number of complaints through project purchasing
- ▶ Increased number of complaints indicates a non-robust design or a non-robust process. Initiation CIP or initiation change process (ECR)

Other valid regulations

- ▶ DCCD 08016-43
- ▶ DCCD 08016-44
- ▶ DCCD 08016-45
- ▶ DCCD 08927

GPc 18 Key Performance Indication and Policy Deployment – after SOP

Task Owner	Purchasing Quality Management
1. Description	Regular quality evaluation and tracking of measures regarding all supplied products for identification of focus suppliers. Assure conformity to the specifications.
2. Result	Analysis and assessment: Overview about quality and current pending complaints, as well as achievement of targets.
3. Area of application	All suppliers (EZRS & HAWA). SQP Scope 1 - 3
4. Due date	Ongoing, at least monthly

5. Possible Input

Possible input:	Responsible for input:	Reference:
▶ All completed and pending complaints from incoming inspection, manufacturing and customers in current year	Supplier, Purch. Quality Mgmt. Plant, Service, Manufacturing, Quality Management and HSE	GPc 44
▶ Trend analysis, statistical evaluation	Purchasing Quality Controlling, Logistics, Purchasing Quality Mgmt, Supplier	
▶ Target agreements	Purch. Quality Mgmt, Supplier, Head of Purchasing, Commodity Purchasing, Project Purchasing	
▶ Supplier pyramid, material field strategy	Commodity Purchasing	

6. Method

- ▶ Analyse KPI* results periodically
- ▶ Ongoing evaluation of supplier's 8D Reports regarding complaints, setting up failure clusters and systematically improvement of 8D quality
- ▶ Ongoing definition of highrunner suppliers and escalation to material field responsible and experts
- ▶ Application of Bosch Rexroth escalation management, expecially managment involvement at E3 cases
- ▶ Selection focus suppliers/supplier learning factory suppliers by material field purchasing, logistics and purchasing quality management
- ▶ Coordinate supplier strategy if several business units are affected
- ▶ Use of PDCA charts for tracking KPI* development as proof of effectiveness for the initiated actions
- ▶ Analyse of complaints by means of KPI* kind of appearance (Where does the failure occur?) and deviation of measures according to risk and severity
- ▶ Agreement of targets (e.g. KPI*, 8D quality)
- ▶ Introduction of Q-table at supplier
- ▶ Evaluation problem solving competence and measures for improvement at supplier
- ▶ Application of problem related Process Improvement Reviews (PIR), Q-Alert
- ▶ Commodity purchasing, logistic and purchasing quality management review measures and decide to escalate if necessary

Other valid regulations

- ▶ CD 82120 (B1.130)
- ▶ DCCD 08016-44
- ▶ DCCD 08016-45
- ▶ DCCD 08901
- ▶ DCCD 08958
- ▶ DCPD 14273-100

*incidents/mio_p, customer incidents, ppm, manufacturing incidents, incidents incoming inspection, failure costs, concessions

GPc 20

Safe Launch - Risik Management for New Suppliers, Material/Technologies

Task Owner	Project Purchasing
1. Description	„Safe Launch“ is a process to ensure that all actions defined before SOP are tracked until completion. Project Purchasing is responsible to ensure that all actions are completed.
2. Result	All actions as defined under 5. (possible input) are completed
3. Area of application	New suppliers, materials or technologies acc. SQP Scope 3 and > 2.000 pcs during ramp-up
4. Due date	Before release for mass production. Open actions items should be documented in checklist with responsibles and due dates.

5. Possible Input

Possible input:	Responsible for input:	Reference:
▶ Special Characteristics	Development, Project Purchasing	GPc 3
▶ TSR: Open point list	Project Purchasing	GPc 8
▶ EMPB: Open point list	Project Purchasing	GPc 12
▶ Capabilities (Cpk, Cmk, Cgk)	Project Purchasing	GPc 16
▶ First/last part inspection at supplier	Purch. Q-Mgmt. Plant	
▶ Release of supplier‘s failure management process (incident management)	Purch. Q-Mgmt. Plant	
▶ Incoming Inspection	Purch. Q-Mgmt. Plant	
▶ Process Review at supplier (up to 2 times during 1st year)	Purch. Q-Mgmt. Plant	

6. Method

- ▶ Processing of defined Check points
- ▶ Completion of checklist (responsibles, due date) through Project Purchasing
- ▶ After completion of all action items: documentation

Other valid regulations

- ▶ SQP
- ▶ GPc and checklists GPc 3, 6, 8, 10, 12, 16, 20
- ▶ Process release
- ▶ Documentation process review

GPc 21 Auditing of suppliers

Task Owner	Purchasing Quality Management - PUQ Technical Services
1. Description	Performance of process audits within the scope of supplier qualification/development and/or performance of incident/problem related Process Improvement Reviews (PIR)
2. Result	Coordinated audit-/PIR scheduling and handling. Accomplished process audits/PIR with scheduled/completed measures.
3. Area of application	DC suppliers world-wide. SQP Scope 1 - 3
4. Due date	According to annual audit-/PIR-scheduling list and in case of incident/problem related cases (PIR)

5. Possible Input

Possible input:	Responsible for input:	Reference:
▶ New products and projects, SQP Scope 3	Project Purchasing	GPc 6
▶ Critical processes, products, e.g. production process, heat treatment, Atex, pressure equipment directive	Quality Mgmt. Product, Development, Purch. Quality Mgmt.	
▶ Escalation – Complaint management, Top Focus Program	Purchasing Quality Management	
▶ Ship-to-Stock/Ship-to-Line strategy	Commodity Purchasing, Logistics	
▶ Preferred Supplier, Supplier Development	Purchasing Quality Mgmt. (Supplier Development), Commodity Purchasing	

6. Method

- The selection of the audited elements (VDA) rests with the lead auditor.
  Normally in case of new developments of the supplier one starts with element 1 and 2, in all other cases with element 3.
  Choice of audit questions: Questions which do not apply to the audited area and thus are not evaluated need to be marked with “nb“ and justified. During determining the questions not required a strict standard needs to be applied.
- The questionnaire regarding environment and occupational health and safety needs to be requested during the process audits, during PIR or during an on-site visit of the supplier (for P-supplier once a year, for all other every 2 years). In case of severe deviations the involvement of an HSE expert is required.
- At the end of the audit a feed back discussion is carried out with the supplier in order to present the result of the audit (deficits and potential for improvement). If necessary, the supplier needs to prepare a measurement plan (dates, responsibilities, status) and to forward it to the lead auditor.
- The audit evaluation is carried out in 3 steps: A-quality capable, B-limited quality capable, C-not quality capable.
  In case of audit evaluation C-not quality capable a downgrading in the supplier pyramid might need to be checked.
  In case of measures which are not completed in time, an escalation to the PURxy mentor is effected.
  In case of audits with at least one major deviation the responsible Purch. Quality Mgmt. Plant receives the cover sheet.
- The measures defined need to be supervised and checked with respect to effectively.
  In case of a missed deadline a risk evaluation needs to be carried out and documented through the lead auditor.
  The completed audit/PIR report and if applicable further documents need to be filed in the SRM tool.
- Criteria for the performance of a re-audit are: audit not achieved, major deviations or downgrading in evaluation. Re-audits refer to the revalidation of the deviating process elements/steps (already audited modules). This is documented with a new audit report and a new audit evaluation and also filed in SRM.
  If no re-audit is necessary a verifying of the introduced measures according to the measurement plan provided from the supplier is sufficient. The total evaluation of the original audit does not change.

Other valid regulations

- DCCD 08910
- DCCD 08993 (N93A12)

GPc 22 Sub-Supplier Quality Management

Task Owner	Sub-Supplier Quality Management
1. Description	Premise: “The direct supplier of DC is responsible for the quality management of sub-supplier.“ All suppliers are obligated to implement the DC requirements towards sub-supplier.
2. Result	Sub-Supplier Quality Management serves the risk minimization by defined processes along the whole supply chain. Risks in this connection are, among other things, defect parts at the customer, problems in the production at DC and high failure costs.
3. Area of application	DC supplier worldwide. SQP Scope 1 - 3
4. Due date	During the entire supplier relation

5. Possible Input

Possible input:	**Responsible for input:**	**Reference:**
▶ Criteria for selection of suppliers may be: - strategic DC products respectively their parts - DC products with noticeable (high) failure rates respectively failure costs - products which caused a “Serious Complaint“ - products with repeated customer complaints - critical processes at the supplier/sub-supplier - large turnover (delivery volume) - new supplier and/or processes - customer requirement	Project Purchasing, Commodity Purchasing, Purch. Quality Mgmt.	

6. Method

Elements of a Sub-Supplier Quality Management and thus requirements of DC toward his suppliers are: This includeds the raw material suppliers defined through DC, and therefore also indirectly the sub-suppliers.

- ▶ Disclosure of the supply chain, out-sourced processes, critical paths, and information about material composition and origin
- ▶ Risk analysis and evaluation of the individual processes, also the outsourced processes, including the emergency and restart planning (business continuity management)
- ▶ Definition of a supplier selection process, qualification, and risk assessments of the supplier
- ▶ Guideline for preventive quality assurance, e.g. audits, (process-) FMEA
- ▶ Securing a continuously requirement management, starting with the DC requirements, especially for „special characteristics“
- ▶ Change management for suppliers, processes, production facilities, etc.
- ▶ Complaint management, including the application of the 8D methodology or similar, for customer complaints, internal complaints, and complaints toward our supplier
- ▶ Determination of quality indicators along the supply chain

The structuring of the individual elements and therefore for the measures to improve respectively to ensure the quality of delivered products and materials (semi-finished products, components, systems, etc.) have to be set according to the potential risks. Particularly critical are failures, which could not be identified in the following process, this means will be detected later in the supply chain or in application.

The application of the requirements at the suppliers, including the raw material suppliers, could be processed like:
Step 1:
Presentation and discussion of the DC requirements with the supplier and point out its responsibility for his sub-suppliers.
Step 2:
Description of already given, required elements, deviations, and proposals for the further proceeding by the supplier.
Step 3:
Evaluation and discussion of the given elements at the supplier by DC. If necessary, decision to measures for a complete implementation of the requirements or for the improvement of given elements. Monitoring of the measure implementation.
Regular review of the Sub-Supplier Quality Management, level of implementation as well as the effectiveness of DC regulations, are to be carried out within given audits of DC at the supplier respectively at the raw material supplier. For the topic Sub-Supplier Quality Management additional audits are not required, the topic have to be included.

Other valid regulations

- ▶ DCCD 08016-041
- ▶ DCCD 08016-042
- ▶ F 3.105
- ▶ DCCD 08943 (CDQ 0602)
- ▶ DCCD 08910 (CDQ 0704)
- ▶ DCCD 08911 (CDQ 0904)

GPc 23 ECR in Purchasing

Task Owner	Project Purchasing
1. Description	Changes to purchased parts are processed according to respective ECR and SQM processes
2. Result	Released engineering change request (ECR) as input for engineering change notification (ECN)
3. Area of application	DC suppliers worldwide, construction, process, logistics and documentation changes. SQP Scope 1 - 3
4. Due date	After completion of preliminary agreement phase ECR process according to DCCD 08927

5. Possible Input

Possible input:	Responsible for input:	Reference:
▶ New supplier, increase in capacity, relocation, supplier change	Commodity Purchasing	
▶ Technical ratio	Project Purchasing, Commodity Purchasing	
▶ Engineering change request / information supplier (*)	Project Purchasing, Commodity Purchasing	
▶ Document change (e.g. correction of not up-to-date internal documents to current state)	Purchasing Quality Mgmt., Project Purchasing	
▶ Eliminate Q problem in the plant, at supplier or customer	Development, Quality Mgmt. and HSE, Purchasing Quality Mgmt.	
▶ Implement customer requirements (Target: customer bears costs)	Development, Sales	

6. Method

- (*) Supplier passes engineering change request (ECR)/information to purchasing according to specification out of agreed QAA considering the risk class (0, 1 or 2) and existing material field specific agreements (e.g. casting). The procedure described below is also valid for internal ECR.
- **Preliminary agreement phase:**
  May be carried out purchasing internal (purchasing internally decision). Amongst others, affected plants, products, customers need to be considered. The manager evaluates the change intent and grants the release. If the preliminary agreement phase decision is that the ECR will not be carried out the mentor should inform the supplier correspondingly.
- **Planning phase:**
  ECR initiated from purchasing/supplier is introduced, explained through purchasing in the ECR meeting of the leading plant and registered through the responsible “Change representative of purchasing“ (generally project purchaser) in the “ECR@BR“-Tool. Further processing is carried out as engineering change request (ECR) through the defined ECR review team.
- Required customer involvement according to DCCD 08937 (incl. appendixes) needs to be decided as soon as possible, latest however in the planning phase. The decision is confirmed in writing through sales.
- The supplier quality plan (SQP) is created and started, if required.
- The completion of the planning phase forms a review through the ECR review team and, in case of approval, the release of resources and budget.
- **Processing and validation phase:** Continuation of SQP with the supplier.
- The validation demand (e.g. production tryout) needs to be clarified and adjusted with all plants effected by the ECR.
- Execution of product and process release (if required) according to defined and in TSR with supplier agreed sampling extend (e.g. adjustment process FMEA, required capability certificate, process release on side).
- **Implementation phase:** Preparation and distribution of released engineering change notification (ECN) through the documentation site.
- Start the follow up processes in purchasing: document exchange and adjustment of relevant contracts (e.g. MERLIN).
- The quality control during ramp up e.g. in case of new suppliers is carried out in line with the SQP through adherence of the GPc 20/Safe Launch.
- **Valid for all phases:** The review result out of the SQP mile stones (e.g. GPc 8/TSR) are presented in the ECR review team and - if applicable - existing risks (e.g. adherence of deadlines, expenses, technical feasibility) discussed and decided.

Other valid regulations

- DCCD 08921, 08927, 08937
- CDQ 00515, 00404, 00405, CD 82300-100 bis -170

Matrix of Responsibilities and Process Activities

Mile-stones	No.	Process Steps/Procurement Process	Result/Documentation	Head of Purch. (PU)	Com. Purch. (MFV)	Proj. Purch. (PUE)	Head of Purch. Quality Mgmt.	PUQ Techn. Services	PUQ plant	Purch. Supplier Dev.	Purch. Controlling	Development	Proj. Leader PEP	Manufacturing	Logistics	Product Mgmt.	Release resp. (FVS)	QMM plant	Experts	Supplier	DCCD 08016-0..
	1	Manage and develop supplier strategy regarding market development and comparison with part specific requirements	▶ Overview of potential suppliers ▶ Result LPA, where applicable audit report, N93A12 audit		R	S		S				S									41
	2	Innovation scouting & routing	▶ Ideas out of supplier market ▶ Identified innovative products and manufacturing technologies		S	R						S		S							41
	3	Selection and verification SE suppliers	▶ Basis specification ▶ Requirements acc. to cooperation model with supplier agreed ▶ Techn. realization concept agreed with supplier ▶ Exchange of information data and (interim) results in the design and manufacturing process (product and process FMEA, design details, characterization data, measurement results, etc.)		S	S						R								S	41
	4	Contractual agreements + supplier release process	▶ Self-disclosure questionnaires completed of potential suppliers ▶ Solvency disclosure ▶ Decision proposal (individual format, e.g. email, presentation, ...) ▶ Signed corporate agreements uploaded in SRM system (incl. QAA) ▶ Supplier created in the system ▶ Process managers have been informed		R	S														S	41
QB0	5	Make/Buy definition available	▶ Rating of performance in core and standard capability ▶ Profitability evaluation ▶ Strategic targets deviated out of the business strategy		R	S		S							I					S	41
HD 1*		**Supplier contacted & potential evaluated**																			
	6	Define measures for product/process development and/or for QM system	▶ Work packages on improvement measures have been defined ▶ Qualification team has been defined			R		A												S	42
	7	Draw up and implement action plan	▶ Action plan (responsibilities, deadlines)		S	S		R	S			S							(S)	S	42
	8	Validate implementation of measures	▶ Completed action plan (Report with evaluation)		S	S		R	S			I		S					I	S	42
	9	Determine special customer requirements and special issues regarding standards/ directives for release	▶ Transfer of special customer requirements to the release plan, e.g. specific tests, proof, sampling to customer, part submission warrant to customer, safety related specification acc. to DCCD 08926			R		S	S			S				S		S			43
	10	Estimation of effort/integration/contraction involved departments & service provider	▶ Defined SQP-Scope (1 to 3) ▶ Estimation of required resources		S	R		S	I			S									43
		Define local/global/ packaging/transport	▶ Specifications for delivery and local /global packaging (logistics specifications)			R									S						43
QB1	11	Pre-Sourcing Meeting/White list selection	▶ Specifications, volumes			R		S[1)]							S					S	43
	12	Define requirements for process release **→ GPc 3, 5, 6, 10 and 12**	▶ Defined sampling extend ▶ Temporary SQP			R		S	S			(S)									43
	13	Preparation inquiry package and review of documents **→ GPc 5 and 7**	▶ Specifications / logistics specifications ▶ Inquiry documents are complete and up-to-date			R		S	S			S			S	S					43
	14	Send RfQ to supplier. If applicable, carry out concept competitions	▶ If necessary, concept competition ▶ Feedback tenders/concept proposals			R		S				(S)			(S)					S	43
HD 2		**Quotation received**																			
	15	Pre-selection potential suppliers	▶ Define at least 2 suppliers out of tender comparison/concept competition			R		S[2)]	(S)			S			S						43
	16	Define SE project	▶ SE project preliminary documentation ▶ SE agreement		I	S		(S)	S			S	R	S	S	S				S	43
	17	Carry out Technical Sourcing Review **→ GPc 8**	▶ Inquiry understood, if possible **GPc 9** ▶ Suggest supplier for Sourcing Meeting ▶ TCO approach			R		S[2)]	S			S	(S)	(S)	S	(S)				S	43

Mile-stones	No.	Process Steps/Procurement Process	Result/Documentation	Head of Purch. (PU)	Com. Purch. (MFV)	Proj. Purch. (PUE)	Head of Purch. Quality Mgmt.	PUQ Techn. Services	PUQ plant	Purch. Supplier Dev.	Purch. Controlling	Development	Proj. Leader PEP	Manufacturing	Logistics	Product Mgmt.	Release resp. (FVS)	QMM plant	Experts	Supplier	DCCD 08016-0..
QB2	18	Comparison of quotation	▶ Completed CoQ form ▶ Announcement sourcing meeting at person responsible for supplier/material field		(S)	R		S							S						43
	19	Sourcing Meeting	▶ Decision for supplier ▶ Documentation of decision		R	S		S				I	I								43
	20	Start release and sampling process SQP **→ GPc 6 and 12**	▶ Full definition of requirements for release (finalized SQP) ▶ Release and sampling process agreed upon with supplier			R[4]		S[2]	S			(S)	(S)	S						S	43
	21	Perform function/endurance test	▶ Report on function and endurance tests ▶ (C samples)			S						R		S							43
	22	Order initial samples	▶ Initial sample order with reference to requirements for product and process release			R		(S)	S											I	43
QB3	23	Prepare sample release (organization) **→ GPc 12**	▶ Release and sampling process confirmed with supplier ▶ Resources and deadlines are planned and confirmed			R		(S)	S			S	(I)	(S)						S	43
HD 3		**Initial samples ordered, sample release prepared**																			
	24	Perform process check (if stipulated) **→ GPc 16**	▶ Acceptance certificate, certificate of process capability			R		S[2]	S			(S)								S	43
	25	Check initial samples (measures and material)	▶ Proposal for release measures and material ▶ Verified EMPB regarding measures and material			I		S	R			S								S	43
	26	Safe Launch **→ GPc 20**	▶ Completed and planned GPc 20			V		S	I			S									43
	27	Final release initial sample	▶ Parts and process released			I			I								R			I	43
	28	Implement decision for release in SAP and start series release	▶ Change SAP Q-stock material info report to series ▶ Start recording recursions initial samples (PUE-KPI)		I	S		I	R			S	I		I	(I)					43
HD 4		**All releases completed**																			
	29	Transfer product specific know how	▶ Material field PIR checklist ▶ Consideration of lessons learned out of earlier projects		I	R		S	(S)												44
QB4	30	Transfer of parts (e.g. order book, buyer group, info record, delivery schedule, ...)	▶ Signed valid agreement with the supplier ▶ Project business hands over project to commodity purchasing/logistics after the first three error free serial deliveries out of different production batches/charges. ▶ End of project ▶ Delivery according to order specification		S	R									S					S	44
HD 5		**Start of serial production**																			
	31	Logistic incoming inspection	▶ LOG-PLKZ, DPR ▶ book goods in IT system											R							45
	32	Technical incoming inspection	▶ Test results of incoming inspection		S	S		S	R					I							45
	33	Approval test lot (delivery)	▶ Released delivery ▶ Data on product related history on quality			I			R					I							45
QB5	34	Claims management	▶ Error permanently eliminated		S	S		(S)	R											S	45
	35	Monitor and Report QKL data (inc./mio_p, customer inc., ppm)	▶ e.g. SAP, PILUM, SRM or Bekis-Q		S	S		S	S	S	R				S			(I)			45
	36	Analysis & assessment of suppliers KPI and QKL incidents	▶ Focus list ▶ Initiation lessons learned process		R	S		S	S	S	S				S						45
	37	Define QKL measures	▶ Q focus program, Supplier learning factory ▶ Relocation projects, technical projects ▶ Q alerts ▶ Audits, PIR **GPc 21**		R	S		S	S	S		(S)			S						45
	38	Track, revise and escalate measures	▶ Degree of attainment of the objectives ▶ Action plan		R	S		S	S	S	S	(S)			S					S	45
CIP		**Continuous Improvement Process**																			
	39	Supplier performance assessment	▶ Overall estimation in SRM tool ▶ Recommendation for supplier award		R	S	I	S	S						S					S	45
	40	Supplier development Q methods	▶ Qualification for 8D, 5W methods, FMEA, capability Q table, etc.		S			R	S											S	45
	41	Continuous improvement process (Q, value stream mapping, etc.)	▶ Optimization QCD ▶ Qualification for new projects		R		A	S	(S)			(S)			S					S	45
	42	Series phase (change, modification, relocation)	▶ Change request (ECR) **GPc 23**		S	R		S	I			(S)								S	45

* Hardness Degree

[1] mandatory: Collaboration PUQ Technical Service at least at scope 3 required
optionally: Collaboration PUQ Technical Service at scope 1 and 2 on request (contracting)
[2] Collaboration PUQ Technical Service, if contracted
[3] MFV comes to final decision
[4] If the parts are delivered to several plants, in case of process changes for sampling/release all plants need to be included in the sampling process.

R = Responsible (verantwortlich)
A = Approval (Zustimmung/Freigabe)
S = Support (Unterstützung/Mitarbeit)
I = Information
( ) = case-by-case (Fallweise)

QMM usually is responsible for functions, which can not be performed by PUQ.

Appendix GPc 6 / *Anhang GPc 6*

Supplier Quality Plan – Project overview
Supplier Quality Plan – Projektübersicht

SQP (Supplier Quality Plan)													
Lieferantenauswahl / *Supplier selection*				**Produkt Engineering und Freigabevorbereitung / *Product Engineering and approval preparation***									
			HD1								HD2		
Material-/ produkt-gruppen-spezifische Anford./ *Material or product specific require-ments*	Lieferanten-selbstaus-kunft/ *Supplier self assessment*	Liefer-antenbe-urteilung durchführen (LPA, etc.)/ *supplier assessment has to be done (e.g. LPA)*	Freigabe für DC (SAP Input)/ *Release for DC (SAP Input)*	Kundenan-forderung berücksich-tigt/ *Customer specification considered*	Rahmenbe-dingungen für Enginee-ringphase festgelegt/ *define framework for engineering phase Festlegung SQP Scope, Definition SQP Scope*	Besondere Merkmale/ *Key Product Character-istics* **GPc 3**	Lessons Learned-Liste analoge Produkte/ *Lessons learned list similar products* **GPc 5**	lokale/ globale Verpa-ckungs-definition/ *local/global packaging defined*	Anforderung EMPB & Produktions-prozessab-nahme festgelegt (Start SQP)/ *Requirement ISIR & process release procedure defined (Start SQP)* **GPc 6 & 12**	Vorberei-tung Pre-Sour-cing Meeting/ *preparation of pre-sourcing meeting*	Anfrage-Dokumente (inkl. Zeich-nungen & Spez.) aktuell & vollständig/ *Inquiry docu-ments (incl. drawings & spec.) up-to-date & complete* **GPc 7**	Technical Sourcing Review (TSR) **GPc 8**	Endgültige Zeichnung und Spezi-fikation aktuell & vollständig/ *Final drawings & specification up-to-date & complete* **GPc 7**
Verantw. / *Responsible*													
R: Datum/*Date* Name/*Name*													
Scope 1													
Scope 2													
Scope 3													

Matrix of application

1 **little extent required = low risk**

2 **higher extent required = medium risk**
- new material group
- new location
- new equipment
- new component group

3 **complete extent required = high risk**
- supplier unknown
- new process
- new material

application mandatory

Teile- und Prozessfreigabe /
Parts and process approval

SQP (wer und wann) abschließend diskutiert/ *SQP (who & when) finally discussed* **GPc 6**	Machbarkeitsbestätigung Lieferant/ *Feasibility confirmation of supplier* **GPc 9**	QAA-Vertrag verhandelt/ *QAA Contract negotiated*	Sourcing Meeting	Funktions-/ Dauerversuch durchführen/ *perform function/ endurance test*	Erstmuster bestellt/ *Initial sample ordered*	Erstmusterfreigabe vorbereiten/ *preparation of initial sample inspection*	HD3 Produktionsprozessabnahme Lieferant durchgeführt/ *Production process approval at supplier carried out* **GPc 16**	Erstmusterprüfung (Teil)/ *Initial sample inspection (Part)*	Erstmusterprüfung (Dokumentation)/ *Initial sample inspection (documentation)*	Erstmusterfreigabe (Maße, Material, Funktion)/ *Initial sample approval (characteristics, material, function)*	HD4 SOP geplant/ *SOP planned* **GPc 20**	HD5 Projektübergabe PUE an PUR/ *project transfer PUE to PUR*

HD1 Supplier contacted and potential evaluated
Lieferant kontaktiert und Potential bewertet

HD2 Offer received
Angebot eingegangen

HD3 Initial sample ordered/Release prepared
Erstmuster bestellt und Freigabe vorbereitet

HD4 All releases carried out
Alle Freigaben durchgeführt

HD5 Start of serial production
Beginn der Serienproduktion

SQP Scope Selection

Supplier						
supplier		material group		plant location		level def.
known	new	known	new	known	new	Scope[1]
	X					3
X			X			2
X		X			X	2
X		X		X		1

Infrastructure				
process [1]		MAE		level def.
known	new	known	new	Scope[2]
	X			3
X			X	2
X		X		1

Part / Component				
part family		material		level def.
known [4]	new	known	new	final
	X		X	3 [2]
	X	X		2
X			X	3 [3]
X		X		1

[1] Sub-processes have to be taken into account, i.e. heat treatment, finishing

[2] If no validation by engineering is requested, down grading from SQP 3 to SQP 2 is acceptable.

[3] If no validation by engineering is requested, down grading from SQP 3 to SQP 1 is acceptable.

[4] That means a reference part from this part family has been released already.

Appendix GPc 7 / *Anhang GPc 7*

Checklist Specification up-to-date & complete
Checkliste Spezifikation aktuell & vollständig

SQP number *SQP-Nummer*		Part number *Materialnummer*	
Project *Projekt*		Part name *Bezeichnung*	
Supplier *Lieferant*		Revision index *Zeichnungsindex*	
Check list owner *Checklistenverantwortlicher*		Date *Datum*	

Updated request documents/ aktuelle Anfragedokumente	**Required *erforderlich***	**Updated request documents *aktuelle Anfragedokumente***	**Required *erforderlich***
Drawing/ *Zeichnung*	✓	Marking of parts/ *Teilekennzeichnung*	-
Bill of material (BOM)/ *Stückliste*	-	LOG requirements specification, incl. specification for local and global packaging/ *LOG-Lastenheft, inkl. lokaler und globaler Verpackungsdefiniton*	✓
Material specification/ *Materialspezifikation*	✓	Measuring devices/ *Prüfmittel*	✓
Heat treatment specification/ *Wärmebehandlungsspezifikation*	✓	Jigs & tools/ *Vorrichtungen & Werkzeuge*	-
QA-documentation (FMEA, etc.)/ *QS-Dokumentation (FMEA, etc.)*	-	Checklist initial sampling GPc 12/ *Erstmuster Checkliste GPc 12*	✓
Key Product characteristics/ *Besondere Merkmale*	✓	Specification for product validation/ *Spezifikation für Produktvalidierung*	-
Work instructions/ *Arbeitsanweisungen*	✓	Acceptance criteria for manufacturing process and production try-outs/ *Abnahmekriterien für Herstellprozess und Fertigungsausprobe*	✓
Norms and standards/ Normen und Standards	✓	Miscellaneous/ *Sonstiges*	-
Prohibited substances (N2580)/ *Verbotene Inhaltsstoffe (N2580)*	✓		

Request documents approved, up-to-date & complete

Start RfQ

Appendix GPc 8/9 / *Anhang GPc 8/9*

Checklist TSR and Feasibility Confirmation Supplier
Checkliste TSR und Machbarkeitsbestätigung Lieferant

SQP number / *SQP-Nummer*		Supplier / *Lieferant*	
Part number, name / *Materialnummer, Bez.*		Date / Datum	

TSR	Comments *Anmerkungen*	Responsible *verantwortlich*	Target date *Termin*
Development / *Entwicklung*			
1. Is the current offer been explained and clearly understood? *Ist das vorliegende Angebot geklärt und eindeutig verstanden?*			
2. Has the function of parts/system been explained and clearly understood? *Ist die Teile-/Systemfunktion erklärt und eindeutig verstanden?*			
3. Have Key Product Characteristics (KPC) been defined? *Sind besondere Merkmale bereits definiert?*			
4. Has supplier made constructive and/or cost saving suggestions (material, equipment etc.)? *Gibt es konstruktive oder Ratio-Vorschläge (Werkstoff, WZe, etc.) seitens des Lieferanten?*			
Quality / *Qualität*			
5. Have Q-Targets (e.g. zero-defect-philosophy) been discussed and accepted (QAA signed)? *Sind die Q-Ziele (z.B. Null-Fehler-Philosophie) diskutiert und akzeptiert (QAA unterschrieben)?*			
6. Does the supplier maintain a functioning sub-supplier management system, incl. suppliers/ process/parts release (for all in the manufacturing involved processes and sub-processes in spite of whether partial or complete production). *Unterhält der Lieferant ein funktionierendes Unterlieferantenmanagementsystem, inkl. Lieferanten-/ Prozess- und Teilefreigabe (für alle an der Herstellung beteiligten Prozesse und Unterprozesse, ungeachtet dessen, ob Teil- oder Komplettfertigung)?*			
Logistics / *Logistik*			
7. Is demand known according to non-binding customer outlook (quantity per year)? *Ist der Bedarf gemäß unverbindlicher Kundenvorschau (Menge/Jahr) bekannt?*			
8. Is output quantity secured? (Machine and tooling concept, tool life, assured production quantity, cycle time, degree of capacity utilization, ...) *Ist die Ausbringungsmenge sichergestellt? (Maschinen- und WZ-Konzept, WZ-Standzeit, zugesicherte Ausbringungsmenge, Taktzeit, Nutzungsgrad, ...)*			
9. Are the logistic specifications, incl. control concept (e.g. STS) and packaging specifications (sample packaging, package circulation (ownership, cleaning, replacement), seaworthy packaging, recovery plan, corrosion protection, ...) available? *Liegt das Logistik-Lastenheft, inkl. Steuerungskonzept (z.B. STS) und Verpackungsspezifikationen (Musterverpackung, Umlaufverpackungen (Eigentum, Reinigung, Ersatz), Überseeverpackung, Notfallkonzept, Korrosionsschutz, ...) vor?*			
Costs / *Kosten*			
10. Is the offer still valid respectively can the current offer meet requirements so that a supplement/subsequent offer is not necessary? *Behält das Angebot Gültigkeit bzw. kann auf ein Nachtragsangebot verzichtet werden?*			

Feasibility Confirmation / *Machbarkeitsbestätigung*	Comments *Anmerkungen*	Responsible *verantwortlich*	Target date *Termin*
Supplier / *Lieferant*			
11. Can product be manufactured reliable according to the requirements? *Kann das Produkt entsprechend den Anforderungen prozesssicher hergestellt werden?*			
Can the supplier confirm the feasibility of Bosch Rexroth requirements? (as defined in the TSR) *Kann der Lieferant die Machbarkeit der Bosch Rexroth Anforderungen (wie im TSR definiert) bestätigen?*			

Remark: All questions which are marked as “No” must be addressed in open points list
Bemerkung: *Zu Punkten, bei denen „Nein“ angekreuzt ist, muss ein Eintrag im Maßnahmenplan vorhanden sein*

Participant/date: / *Teilnehmer/Datum:*
for supplier: / *für Lieferant:* for Bosch Rexroth: / *für Bosch Rexroth:*

Remark: Latest with the proposal submittal the feasibility commitment is confirmed.
Bemerkung: *Spätestens mit der Angebotsabgabe gilt die Machbarkeit als bestätigt.*

Other valid documents

Incorparated process descriptions:	
Document Number	**Title**
DCCD 08016-001	Procurement Management - Procurement Management Process
DCCD 08016-041	Procurement Management - EZRS & HAWA, Supplier Selection
DCCD 08016-042	Procurement Management - EZRS & HAWA, Qualification, enabling and development of suppliers
DCCD 08016-043	Procurement Management - EZRS & HAWA, Contracting and parts release
DCCD 08016-044	Procurement Management - EZRS & HAWA, First standard deliveries, Purchasing after SOP
DCCD 08016-045	Procurement Management - EZRS & HAWA, Key performance indicators & policy deployment

Additional valid documents:	
Document Number	**Title**
DCCD 08007-002	Product Engineering Process (PEP) Series business - Components: Hardware (HW)/Software (SW)
DCCD 08414-001	Preferred-Supplier-Concept for EZRS- and MAE-Material fields
CD 3802	RB-Norm N2580 Prohibition and Declaration of substances
RB N 2580-1 Appendix	RB N 2580-1 Appendix Supplier declaration on substances
CD 00517	CDQ0517 ”Lessons Learned”
CD 00306	CDQ0306 Automotive “Management of Special Characteristics”
CD 00509	CDQ0509 ”Concessions”
DCCD 08921	Initial sampling of Products
DCCD 08943	CDQ0602 ”Quality Indicators in Purchasing“ DC specific regulations/supplements
DCCD 08944	CDQ0603 ”Quality Management for Purchased Raw Materials (EZRS) and Trade Goods“ DC specific regulations/supplements
CD 82300	B1.300 EZRS Purchasing Agreements
CD 82120	RB Escalation Management for Supplier Problems with Purchased EZRS Products
DCCD 08901-AN5	Processing of internal and external complaints - Problem Solving according to the 8D Method
CD 00402	CDQ0402 "Inspection Planning, Capability, and Process Control"
CD 00403	CDQ0403 "Control Plan"
DCCD 08914-001	CDQ0305 Automotive ”Technical Risk Management - FMEA” - DC-specific regulations/supplements
DCCD 08914-002	CDQ0305 Non-Automotive "Technical Risk Management Non-Automative”-DC-specific regulations/supplements
DCCD 08955	Incoming Inspection at DC

Glossary

5W-Method	The 5 W Method is a practice of asking, five times, why the failure has occurred in order to get to the root cause/causes of the problem.
8D-Report/-Method	8 D is a short description for a concept formed of Ford-Motor-company for structured problem solving in a project group. The concept contains an action plan divided in 8 steps, which was introduced under the abbreviation 8D (8 disciplines). This concept is divided as follows: D1: Installation of Problem Solving Team D2: Describe the problem D3: Initiate interim (containment) actions D4: Identify and prove the root cause D5: Choose and verify (permanent) corrective actions D6: Take actions to prevent reoccurrence D7: Monitoring of dates D8: Praise resp. critical acclaim
Audit	An audit is a systematic inspection to determine whether a quality system complies with planned arrangements. Quality audit applies to elements of QM-System (quality system audit), the elements of production with quality risks (process audit) as well as elements affecting product quality (product quality audit).
BEKIS-Q	Abbr. Bosch Purchasing Information System Quality (German: Bosch Einkaufsinformationssystem Qualität)
BOM	Abbr. Bill of Materials (German: Stückliste)
CIP	Abbr. Continuous Improvement Process (German: kontinuierlicher Verbesserungsprozess)
Complaint list	Claims list and grading of failures DCFRom prototype-build and first series production
CoQ	Abbr. Comparison of Quotation (German: Angebotsvergleich)
DC	Abbr. Drive and Control Technology, description of Bosch Rexroth AG
DCCD	Abbr. Central Department Directive of DC (German: Zentralbereichsanweisung)
DC/PU	Head of Purchasing (German: Einkaufsleitung)
DC/PUQ	Head of Purchasing Quality Management (German: Leitung Einkauf Qualitätsmanagement)
DPR	Abbr. Delivery Performance Reporting (German: Liefertermintreue)
ECR	Abbr. Engineering Change Request (German: Änderungsanregung)
EMKZ	Abbr. Initial Sampling Indicator A weighted indicator for the percentage of interruptions caused by suppliers during initial sampling activities at DC. (DCCD 08943, DCCD 08921, CDQ0602, CDQ0515); (German: Erstmusterkennzahl)
EMPB	Abbr. Initial sample test report (ISIR) (German: Erstmusterprüfbericht) The initial sample inspection report contains of a cover page and the inspection result sheets agreed between the customer and the supplier as well as other required documents.
EZRS	Abbr. Product raw materials (German: Erzeugnisrohstoffe)
FG	Abbr. Feasibility Grade (German: Härtegrad)
Fit & finish	Parts release in form, fit, function and colour by assembly
FMEA	Abbr. Failure Mode and Effects Analysis The FMEA is a systematized technique which identifies and ranks potential risk in order to prioritize improvement actions.
FVS	Abbr. respective release process owner (German: Freigabeverantwortliche Stelle)
GPc	Abbr. Good Practice - Document with recommendation for the implementation of an obligatory standard
HAWA	Abbr. Trade goods (German: Handelsware)
HSE	Abbr. Health, Safety and Environment (German: Arbeits-, Brand- und Umweltschutz)

Glossary

Incidents/mio. p	Number of incidents per million parts (German: Anzahl Störfälle pro Millionen Teile)
ISIR	Abbr. Initial sample test report (ISIR) (German: Erstmusterprüfbericht)
ISIR Point CiP	Abbr. Initial Sample Point CiP (German: Erstmuster-Point-CiP)
KPC	Abbr. Key Product Characteristics (German: Besondere Merkmale)
KPI	Abbr. Key Performance Indicator (German: Kennzahl)
LEB	Abbr. Assessment of supplier result (German: Lieferantenergebnisbewertung)
LOG	Abbr. Logistics
LPA	Abbr. Lean Plant Assessment
LPB	Abbr. Supplier result assessment (German: Lieferantenpotential-Bewertung)
MAE	Abbr. Machinery and Equipment (German: Maschinen und Einrichtungen)
MCR	Abbr. Material Cost Report
MFV	Abbr. Person responsible for material field (German: Materialfeldverantwortlicher)
MNR	Abbr. Material-Number (German: Materialnummer)
OPL	Abbr. Open points list (German: offene Punkte Liste)
PDCA	Abbr. Plan, Do, Check, Act; (German: Planen, Tun, Prüfen, Umsetzen)
PEP	Abbr. Product Engineering Process (German: Produktentstehungsprozess) The Product Engineering Process (PEP) describes the work flows from the idea for a new product until the production and sale of the product.
PIR	Abbr. Process Improvement Review (German: Überprüfung der Prozessverbesserungen)
PPAP	Abbr. Production Part Approval Process (German: Produktionsteil-Abnahmeverfahren) Reference document to QS-9000. It includes generic requirements for production part approval for all production and service commodities, including bulk materials. The purpose of this procedure is to determine if all customer engineering design record and specification requirements are properly understood by the supplier and that the process has the potential to produce series product, meeting these requirements during an actual production run at the quoted production rate.
ppm	Abbr. parts per million (German: Teile je Million) 100 ppm means 100 non-conformities per 1.000.000 parts. This corresponds to 0,01 % non-conformities.
Process characteristics	A process characteristic is a characteristic of a part, component or system, that: a) significantly affects the following process to produce the Key Product Characteristics b) has huge effects to the error risk in the production in case of small deviations.
PUE	Abbr. Project Purchasing (German: Projekteinkauf)
PUE ppm	ramp up ppm
PUQ	Abbr. Purchasing Quality Management (German: Einkauf Qualitätsmanagement)
PUQx	Abbr. PUQ Technical Services (German: PUQ Technical Service)
PUQ plant	Abbr. Purchasing Quality Management plant (German: Einkauf Qualitätsmanagement des Werkes) (Incoming inspection, sampling and claims management)
PUR	Abbr. Commodity Purchasing (German: Materialfeldeinkauf)
QAA	Abbr. Quality Assurance Agreement (German: Qualitätssicherungsvereinbarung)

Glossary

QAM	Abbr. Quality-Assurance-Matrix The main targets of the Quality-Assurance-Matrix (QAM) are no delivery of faulty parts to the customer and the avoidance of failure reoccurrence. The QAM is the quality tool behind the expression “Firewall” and will support this goal by elaborating a virtual “wall” against faulty parts.
QB	Abbr. Quality Assessment (German: Qualitätsbewertung) Quality assessment (QB0-QB5) serves the determination and recording of the quality level, DCFRom product development to start of production. The results of a QB are essential for the release decision concerning the following development phase (for details see DCCD 08934).
QKL	Abbr. quality, costs, logistics (German: Qualität, Kosten, Logistik)
QI	Abbr. Quality initiative
QMM	Abbr. Quality Management and HSE (German: Qualitätsmanagement und HSE)
RB	Abbr. Robert Bosch GmbH
RfQ	Abbr. Request for Quotation (German: Angebotsanfrage)
Run@Rate	Activity to verify that the supplier‘s actual manufacturing process is capable of producing components that simultaneously meet: (1) on-going quality requirements (2) quoted tool capacity (3) scheduled volume requirement
SE	Abbr. Simultaneous Engineering (German: (wörtl.) „Gleichzeitige Ingenieurtätigkeit“) SE aims to lower the duration of development and to decrease development costs. Often, SE is named in connection with an organizational strategy to simultaneously develop products and processes with inter-disciplinary teams.
Ship to Line Concept	Shipment directly to the conveyor/assembly
SOP	Abbr. Start of Production (German: Start der Serienproduktion)
SPC	Abbr. Statistical Process Control (German: Statistische Prozessregelung) SPC is a standard method for visualizing and controlling processes based on the results of random samples. The goal of SPC is to ensure that planned process results are achieved and the corresponding customer requirements fulfilled.
SQM	Abbr. Supplier Quality Management
SQP	Abbr. Supplier Quality Plan
SQP Scope	Classification of parts or components (level) for pre-selection of kind and extend of required scope of delivery for quality planning and release. Level 1: Common element or standard/ISO part. Production process without risks. No additional requirements in excess to the general conditions of delivery. Level 2: Common element or material according to drawing. Production process known. No additional requirements for initial sampling with test report and parts, as well as a production release on site. Level 3: Complex element or module/component with important functions. Complex production process.
SRM-Tool	Abbr. Supplier Relationship Management The Supplier Relationship Management Tool (SRM-Tool) is the future leading system for strategic planning and central management of supplier relations within the entire RB purchasing organization. Via bundling information concerning supplier characteristics and performance indices it permits to save resources and to further improve the supplier base.
TCO	Abbr. Total Cost Ownership (German: Komplette Systemkosten)
TSR	Abbr. Technical Sourcing Review Review all issues of RFQ, relevant for feasibility of process, technology, logistics, schedule and cost.
VQS	Abbr. Preventive Quality Management (German: Vorbeugende Qualitätssicherung)

The Drive & Control Company

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