

SKF Qs

Quality standard for suppliers, edition 5.0



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This SKF Qs is also accessible on www.skf.com along with additional relevant information supporting the content of this document.

General requirements

This Quality Standard is established so that suppliers fully understand and comply with the SKF policies and specific requirements set forth.

Upon receipt of this Quality Standard, suppliers are required to perform a systematic documented review.

Scope

SKF Qs – Quality standard for suppliers, edition 5.0, applies to suppliers of products that have an impact on the quality of SKF's finished products or on the image of the SKF brand. It also applies to bearing steel makers not delivering directly to SKF but used for SKF rolling components. It also includes suppliers of indirect materials and services as well as manufacturers of machinery and related components.

This document does not replace or alter other terms and conditions or related technical documents provided by SKF.

Main changes in this edition 5.0 compared to the previous SKF Qs edition 4.1 are:

- New structure with four sections
- General requirements (section 1) including:
 - REACH regulation
 - RoHS directive
 - Packaging directive
 - California proposition 65
 - Conflict minerals laws requirements
 - Zero Defect management approach
 - Pre-requisites for supplier approval
 - Energy intensive supplier classification
- Specific requirements for direct materials and subcontracting (section 2) including:
 - New list of audit questionnaires
 - New process capability requirements
 - New change control requirement (VCRN)
 - New vendor conformance complaint (VCC) and escalation approach.
 - New vendor delivery complaint (VDC)
 - New requirements for production planning and physical flow
- Specific requirements for indirect materials and services
- Specific requirements for capital equipment

Adoption of SKF major business principles:

“Commitment” with the SKF Qs Standard implies mandatory adoption of the following key principles:

- SKF Code of conduct for suppliers and subcontractors
- SKF Environmental, health and safety policy (SKF EHS policy)
- SKF Zero Defect (SKF ZD) concept as conformance and performance standard.

Code of conduct for suppliers and subcontractors

Code of business ethics, see “SKF Code of conduct for suppliers and subcontractors” at (www.skf.com/group/supplier-portal)

- Suppliers shall adopt the principles of the SKF Code of conduct for suppliers and subcontractors.
- It is strongly recommended by SKF that suppliers develop such a code of their own. Some selected suppliers will be specifically requested by SKF to implement such a document based on the scope, type of business, customer requirements or for other valid reasons.
- Suppliers shall provide evidence of compliance with these principles when requested by SKF.
- SKF will use various methods to assess supplier and sub-contractor performance in these areas. The adherence to this code must primarily be based on trust, but SKF,

or SKF appointed third party will, from time to time, perform audits announced or unannounced, supplier self-assessments and regular requests for submittal of information or data related to supplier and sub-contractor performance.

- Suppliers to SKF shall also ensure that their sub-suppliers and subcontractors shall adopt the principles of the SKF Code of conduct for suppliers and subcontractors.

Environmental, health and safety policy

See “SKF Environmental, health and safety policy (SKF EHS policy)” at (www.skf.com/group/supplier-portal).

- Suppliers shall adopt the principles of the SKF Environmental, health and safety (EHS) policy.
- Suppliers shall implement and maintain an effective environmental management system.
- Supplier shall aim at ISO 14001 and ISO 50001 third party certification by an accredited certification body.

Some selected suppliers will be required by SKF, in writing, to be certified to ISO 14001. In case certification is not yet achieved an implementation plan for such activities will be required, with a deadline of no longer than 18 months.

Some selected suppliers classified by SKF as Energy intensive suppliers will be required, in writing, to achieve ISO 50001 certification. In case certification is not yet achieved, an implementation plan for such activities will be required with a deadline of no longer than 24 months.

Environmental parameters shall be measured and reported, at regular intervals, to the supplier management and employees.

Supplier manufacturing facilities shall comply with all government safety and environmental regulations and documented

evidence shall be provided when requested by SKF.

If problems occur concerning compliance with legal EHS demands relating to the co-operation with SKF, suppliers shall immediately inform SKF.

Suppliers shall abide by limits set on the Global Automotive Declarable Substance List (GADSL, accessible on internet via the following link: www.gadsl.org) for all hazardous substances included in any product delivered to SKF or used in the related manufacturing processes.

SKF apply and promote transparency management, suppliers shall therefore have procedures in place to comply or support SKF's compliance with:

- REACH (regulation (EC) No 1907/2006 concerning the registration, evaluation, authorization and restriction of chemicals), including substances of very high concern, SVHC, on the candidate list,
- RoHS (directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment),
- Packaging (directive 94/62/EC on packaging and packaging waste),
- California proposition 65 (The safe drinking water and toxic enforcement act of 1986), and other applicable legal requirements.

Suppliers shall also be able to provide information to demonstrate compliance of products supplied to SKF. SKF expects suppliers to inform SKF when changes in their products or in regulatory requirements have impact on the above.

Suppliers shall comply with SKF's support of the effort to avoid the use of certain minerals mined in the "conflict region" of Africa (comprised of the eastern portion of Democratic Republic of Congo and surrounding countries). Suppliers will identify if the products provided to SKF contain one or more of these "conflict minerals" (tantalum, tin, tungsten and gold). If the products contain conflict minerals, the supplier shall determine if the minerals are intentionally added to the products and necessary to the production of products. The supplier shall identify to SKF the source of conflict minerals in such products and shall ensure that any conflict minerals in their products are certified as "conflict free".

Steel makers supplying SKF factories directly or indirectly shall inform SKF of any

risks relating to radioactive contamination. This shall include information such as:

- How monitoring of radioactivity at truck/ railway entrances or landing places is executed
- Level of radioactivity
- Photos of equipment
- Example of measuring protocol
- Calibration certificate for measuring equipment

Zero defects management

Approval given by SKF does not relieve suppliers of their obligation to deliver the right product, to the right place, at the right time with Zero Defects (ZD).

The ambitious goal of Zero Defects requires maximizing efficiency and minimizing waste throughout the organization.

In order to achieve these goals, suppliers shall develop appropriate documented ZD programmes for SKF products covering:

- The right process and technology
- The right support and service processes
- The right people
- The right organization and methods
- The right SKF sourcing interface (www.skf.com/group/supplier-portal/)

Continuous improvement

Supplier performance reports

SKF actively monitors supplier performance according to the following key performance indicators (QCDIM):

- Quality
- Cost
- Delivery
- Innovation
- Management

Such QCDIM reports are used as a decision base for future business demands and may also be shared with suppliers.

Suppliers shall report results and relevant improvement activities on agreed key measurements. If requested by SKF, suppliers shall aim to increase SKF QCDIM satisfaction by proposing improvements to delivered products or processes in use.

Supplier development audits

As part of the SKF supplier development activities, SKF may perform on-site audits to

identify opportunities for improvements regarding any aspect of this standard. Such development audits are:

- SKF Standard supplier quality audit
- Zero defect audit (SKF ZD)
- Code of conduct audit (SKF CoC)
- Corrective action audit (SKF CAA)
- Supply chain audit (SKF SC)

Pre-requisite for supplier approval

Suppliers must have documented quality and environmental management systems.

Suppliers may be requested to be certified by an accredited third party certification body, for the appropriate scope. In this case they shall provide SKF with a copy of the valid certificate.

For some selected suppliers SKF may require, in writing, the following certifications due to a specific scope, business or customer requirements:

- ISO 9001
- ISO TS 16949
- IRIS
- EN/AS 9100
- ISO 14001
- OHSAS 18001
- SA 8000
- ISO 50001

Suppliers not meeting the certification requested by SKF shall submit an implementation plan to reach certification status within 18 months (24 months for ISO 50001) from receiving the SKF Quality Standard.

Agreement to the SKF Qs requirements is mandatory.

Specific requirements – direct materials and subcontracting

System and process approval

Direct materials and subcontracting suppliers shall be as a minimum ISO 9001 Quality management system (QMS) certified by an third party part certification body, for the appropriate scope. Additional certifications may be requested due to a specific scope, business or customer requirements.

Approval criteria requires visits to supplier's premises using appropriate approval procedures. Thus, suppliers shall allow SKF access to their manufacturing location (as well as sub-suppliers if necessary) in order to enable SKF to conduct effective auditing activities of the supplier's management system and relevant processes.

Suppliers shall co-operate fully with SKF representatives in the course of such activity and implement the changes that are agreed with SKF.

Typical certification audit questionnaires in use by SKF are:

Advanced product quality planning

Agreement on technical documentation

Technical documentation is provided by SKF in the form of:

- a drawing,
- list of critical (CC), significant (SC) and high impact characteristics (HIC),
- material standards and practices,
- packaging and delivery conditions
- other product specifications,

and will be referred to within purchase orders or agreements.

Any documentation provided to suppliers by SKF shall be considered as SKF property and as such shall be treated as highly confidential.

Suppliers shall use structured methods (detailed feasibility study) to assess the ability

to meet SKF specifications. CC, SC and HIC characteristics shall be identified (specified by SKF on drawing or other SKF documents and/ or requirements coming from supplier's own processes) as part of the feasibility study and clearly identified on related working documents such as process-FMEA, Control Plan, Work Instruction and Inspection Instruction. Documented evidence shall be retained and made available to SKF upon request. (See Documentation, Traceability and Record section).

Suppliers shall formally confirm to SKF their agreement on final product specifications and also on all applicable subsequent changes. Documented evidence of such agreements shall be retained and made available to SKF.

Zero defect plan

Suppliers shall use structured quality methods aiming at Zero Defects as the product acceptance standard from the start of the product quality planning process.

Suppliers must formally commit to Zero Defect as an objective. The ZD approach and structure is detailed in SKF's Group ZD manual for suppliers (refer to www.skf.com/group/supplier-portal).

Suppliers shall develop an effective Zero defect plan with the target of achieving Zero Defect at "start of production".

Audit format	Purpose
Technical visit	Initial visit to identify alignment between supplier and SKF
SKF QT3	Supplier approval for direct material suppliers and other suppliers that affect product quality , including traded products suppliers
SKF Run@Rate	To verify the supplier's process capability to produce at the SKF required rate
SKF ZD	Supplier approval/Development for direct material suppliers and other suppliers that affect product quality
SKF Design assessment audit	To verify ability of supplier to design products according to the market needs (traded products)
SKF QT3 Bearing steel maker (SKF QT3 BSM)	Approval of steelmakers
AIAG CQI-9 Heat Treat System Assessment	Approval of heat treat facilities for certain specific heat treatments
SKF Code of conduct audit (SKF CoC)	Supplier approval related to Code of conduct

Process flow chart

For all SKF products, and/or family of products, suppliers shall establish a unique schematic diagram, hereafter called the "process flow chart" covering all process steps from receiving materials to delivery, including subcontracted operations. It shall include:

- Sequence of production and inspection stations.
- Type and reference number of key production equipment.
- Method of moving products or material that could potentially impact quality.
- Disposition flow after inspection stations, as well as after rework.

Assessment of potential risk of failure

For all SKF products, and/or family of products, suppliers shall perform, maintain and document a structured activity plan to assess:

- the potential occurrence of defects
- the possibility of non-detection of defects

throughout the process, including sub-contracted operations and delivery.

Input for such activity shall be based on existing data, as well as customer input in particular for the assessment of the SEVERITY (effect) of each defect for SKF. The output shall quantify risk assessment in order to prioritize adequate improvement actions and finalize the supplier's process flow chart and control plan.

(NOTE: SKF recommends using the Process-FMEA concept from the AIAG publication).

This document shall be controlled, retained and made available to SKF upon request.

SKF may also request a Design-FMEA (D-FMEA) when necessary due to the scope, design responsible status, type of product / application or due to other customer requirements.

Control plan

For all SKF products and/or family of products, suppliers shall establish a unique document, hereafter called the "supplier control plan", describing all process and product control activities that impact the quality of SKF products.

The supplier control plan shall follow the same sequence as the process flow chart from receiving materials to delivery, including subcontracted operations. The control plan shall include:

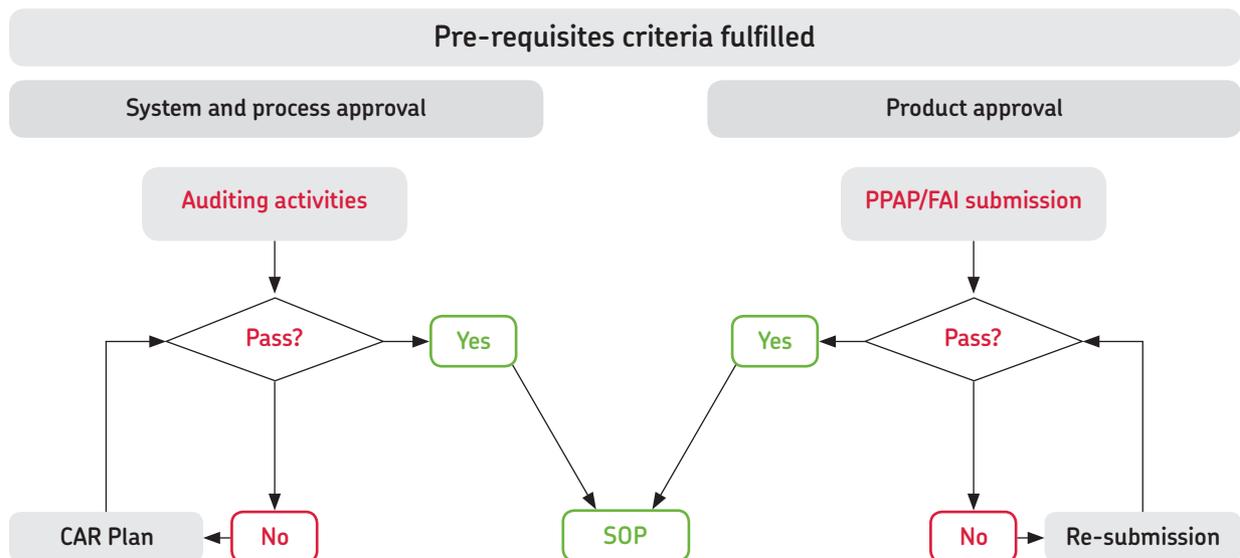
- Reference to SKF Part No. and latest revision level.
- All product and process parameters specified by SKF or identified by supplier that have impact on SKF products.
- Special identification of critical (CC), significant (SC) and high impact characteristics (HIC).
- Assessment and measurement techniques, necessary gauges and test equipment's for both the set-up phase as well as production phase.
- Control method, such as statistical process control (SPC), inspection records, mistake proofing, automatic equipment, etc.
- Reaction plan for non-conforming products or operations out of control.

NOTE: SKF recommends the formats shown in the "Advanced product quality planning and control plan" from the AIAG publications.

Control plans shall be developed for all SKF new or modified products and related processes. They may be based on an existing control plan.

Process flow charts and control plans shall be controlled documents with, if requested, SKF on the distribution list (see section "Change control").

Advanced product quality planning (Zero Defect approach)



Prototypes

For testing purposes, SKF may require suppliers to deliver manufactured prototypes of the product.

Prototypes shall be manufactured by the same sources and sub-contractors intended for use in series production. SKF shall be formally notified of any deviation from this requirement. Suppliers shall not manufacture the prototypes until deviation has been approved by SKF.

Control plans for prototypes shall be made available upon request, as well as the list of any sources and subcontractors used to manufacture the part.

A release of prototypes by SKF does not imply a product approval status, as described in the next section.

Product approval

Depending on product type, SKF will notify suppliers of specific activities required to verify the conformity to specifications. The objective of this process is to grant formal product approval status.

Approval of bearing steels for rolling components

Bearing steel (such as billets, rounds for tubes, bars, wires, etc.) for the manufacture of rolling components shall always be approved by SKF prior to use by SKF or used by suppliers supplying to SKF. Approval of such steel requires submission of samples and a metallurgical property assessment of a number of pilot deliveries, as specified by SKF.

SKF approval is always granted for a defined and controlled process route.

Approval of semi-finished products, components and subcontracted operations

Suppliers will be required to apply one of the following procedures for the approval of SKF purchased products:

Production part approval process (PPAP) submissions for which suppliers shall strictly apply the requirements from the AIAG publications. Unless stated differently in the SKF order, suppliers shall use PPAP level 3 as default.

NOTE: (refer to production part approval process from the AIAG Publications)

- PPAP submissions require parts to be taken from a production lot of minimum 300 pieces, unless otherwise specified by SKF. This lot shall be manufactured under all the conditions intended to be used for series production.
- First article inspection (FAI) submissions for which suppliers apply AS9100 Aerospace requirements, require traceability between samples and production run.

Suppliers shall submit for PPAP/FAI:

- Specified quantity of samples.
- Inspection report showing full compliance with all SKF specifications.
- Process capability studies, for any SC or HIC characteristics with a minimum Cpk/Ppk value of 1,67 (1,33 may be acceptable with 100% inspection suggested/required depending to specific characteristics). CC shall be 100% assured.
- Process flow chart.
- Control plan.
- Material certificates.
- P-FMEA.
- SKF specific forms (refer to www.skf.com/group/supplier-portal).

If required by SKF a "Run at Rate" audit will be performed at the supplier's premises between first "off tool production" and the end of the ramp-up phase to verify that the actual process is according to plan, as documented in PPAP/FAI (in line with the Zero Defect objective) to demonstrate the supplier's ability to produce at the SKF required rate.

SKF confirmation of product approval

SKF will complete the assessment upon receipt of the PPAP or FAI documentation; formal written approval will be granted when confirmed that product specifications have been met and requested documentation has been reviewed and approved.

Approval of parts is granted for the specific process route defined in the "Process flow chart". This is the basis for change control procedure (see section "Change control") in order to assure that any modification to this process route will require prior approval from SKF.

Suppliers are not permitted to supply series production products before confirma-

tion of product approval from SKF. If assessment shows that agreed product specifications have not been met, SKF will notify suppliers of the nature and extent of the non-conformance and provide further requirements for corrective actions. SKF quality may issue conditional approvals.

Start of production (SOP)

Approval status granted by SKF does not relieve suppliers of their responsibility to verify that all activities planned during the product quality planning phase are completed and suitable for series production such as:

- PPAP/FAI nonconformances still open.
- Open issues with subcontractors.
- Open issues on documentation (flowchart, control plan, P-FMEA etc).
- Capacity problems.
- Capability deficiencies.

Non-conformances must be closed at an agreed time with SKF quality.

Open issues on documentation must be completed at an agreed time with SKF quality. Capability deficiencies (Cp, Cpk) must have an action plan with due closure dates as agreed with SKF quality.

Manufacturing

Manufacturing process control

The SKF acceptance on agreed product specifications is Zero Defects.

To attain Zero Defect status, the supplier shall:

- Maintain all critical (CC), significant (SC) and high impact (HIC) characteristics under statistical control that satisfies a minimum Cp/Cpk value of 1.67
- Institute 100% inspection when minimum Cpk cannot be obtained or maintained.
- Implement mistake proofing methods.
- Have Cp and Cpk information available upon request.
- Monitor CC, SC and HIC parameters using statistical methods, such as "Statistical process control (SPC)".

(NOTE: SKF recommends the AIAG "Statistical process control – Reference manual").

Production equipment maintenance

Suppliers shall identify key process machines /equipment and develop effective “Total preventive maintenance” (TPM) such as:

- Routine maintenance by operators (cleaning, oiling, small repairs, standardized check lists).
- Preventive maintenance (fixed interval inspection).
- Corrective maintenance (planned and unplanned repairs).
- Enhanced maintenance prevention (design of existing equipment, purchasing policies and requirement specifications, improvement teams).
- Continuous review of the total performance of maintenance.

Measurement analysis

The capability of measuring systems shall be determined using analytical methods.

(NOTE: SKF recommends the AIAG “Measurement systems analysis – Reference manual”).

Documentation, traceability and records

Suppliers shall maintain traceability for the supplied product back to material sources based on CC, SC and HIC characteristics, and on other processes affecting quality or material properties. Suppliers shall retain manufacturing records (such as nonconformance follow-up, first and last piece approval, SPC monitoring data, Cp, Cpk studies or 100% measurements, inspections as well as relevant maintenance records, product approval (PPAP, FAI) documentation for a minimum of three years, unless otherwise specified by SKF.

These records shall be made available to SKF upon request.

Change control

Changes affecting products and processes require prior approval from SKF.

Unless specifically waived by SKF, suppliers shall submit to SKF a vendor change request notification [VCRN, see www.skf.com/group/supplier-portal] for changes such as:

- Engineering change to design records, specifications or materials.
- Changes in process or method of manufacture or in the inspection plan having impact on quality of delivered product (refer to supplier control plan and to process flow chart or process route).
- Change of material or its source.
- Change of source for sub-contracted parts or services (e.g. heat treatment, surface treatment, turning operations).
- New or modified tools (except perishable tools), including additional tool, replacement, or refurbishment, etc.
- Production from tooling and equipment transferred to a different plant location

Upon review of a VCRN, SKF may invoke product approval processes.

(NOTE: for further details on list of applicable changes, refer to AIAG “Production part approval process – Reference manual”).

SKF shall also be notified in case of mergers, acquisitions or affiliations.

Non-conformances identified at suppliers’ premises

A non-conforming product identified by a supplier shall not be shipped without prior documented SKF approval relating to the concerned scope. A product shipped under such approval shall be identified on each shipping container, according to SKF instructions.

In case of a problem or potential problem that may affect the scheduled delivery terms, suppliers shall immediately inform SKF.

Non-conformances identified at SKF or at the final customer’s premises

In order to cover costs caused by defective products at SKF or at the final customer premises, suppliers shall maintain appropriate product liability insurance and provide proof of insurance to SKF upon request.

Any product that does not meet SKF acceptance criteria, whether found at SKF or at the final customer’s premises, will be recorded and “assigned to supplier” by the receiving SKF unit and an official vendor conformance complaint (VCC) will be issued to the supplier.

SKF will provide a specific “corrective action report (SKF CAR) format for every complaint.

Supplier shall always use the SKF CAR format when answering any VCC.

Suppliers shall maintain effective documented procedures, using team approaches and disciplined problem-solving methods, including 5 WHY analysis, to ensure that on receipt of a VCC they will:

- Implement immediate actions, and report to SKF within two working days, with logistical and containment actions information.
- Perform root cause analysis (for the defect, for the non-detection and for systemic causes).
- Analyze impact on process flowchart, control plan and P-FMEA and, if applicable, update such documents and make available to SKF.
- Implement permanent process-related corrective action for reducing defects towards Zero Defect.
- Close VCC when the effectiveness of the action has been confirmed.
- Inform SKF of the progress of a corrective action until completion of said corrective action, verification and closure.

In case of a nonconformance, SKF (as well as the appropriate SKF customer) has the right to perform a quality audit to verify the effectiveness of problem-solving activities.

When the nature of the defect may affect the performance of SKF in delivering to the final customer, SKF may require suppliers to conduct in a timely manner sorting operations at SKF’s premises, designated third party inspection source or at SKF’s customer location at the supplier’s expense.

Suppliers not showing improvement in the number of VCC’s will be subject to escalation approach (see www.skf.com/group/supplier-portal) from SKF which may result in controlled shipment level 1 (CSL1) and/or controlled shipment level 2 (CSL2).

- CSL 1: 100% redundant inspection at the supplying location.
- CSL 2: Third party redundant inspection process in addition to normal controls and CSL1.

Responsibility towards sub-suppliers and subcontractors

Suppliers to SKF are responsible for supplied material, components and subcontracted operations.

Suppliers shall ensure that sub-suppliers and subcontractors have valid third party QMS certification according to ISO 9001 if the supplied material, component or subcontracted operation has an impact on product quality or physical properties on the product supplied to SKF. If this requirement is not met, suppliers are not allowed to use the sub-suppliers or subcontractors unless prior approval has been given by SKF.

Suppliers shall purchase the relevant materials from SKF approved sources (sub-suppliers or subcontractors) if specified by SKF. The use of such sources does not relieve suppliers of their obligation to ensure quality of supplied materials, components and subcontracted operations.

Note for bearing steel sources: the bearing steel manufacturer and related process route used for PPAP are part of the approval. Suppliers are not authorized to change to another source or process route even if another steel manufacturer is in the list of SKF approved sources. See section "Change control".

Supply chain

Supply chain agreement

The overall Zero Defect objective also includes quality of service, including the reliability of delivery promises. SKF's target for on-time delivery is zero broken promises. In order to achieve this goal, suppliers shall define and agree to the following with SKF:

- Key logistics parameters (SKF requested date, throughput time, transportation lead time).
- Definition of operational direct contacts between suppliers and the SKF concerned unit.
- System measurement in place on delivery performance.

SKF New supplier delivery concept (SKF NSDC)

SKF will designate some suppliers for deployment of the SKF New Supplier Delivery Concept (NSDC). After a signed agreement between SKF and Supplier, no other conflicting parallel planning systems may be used for the defined scope.

Production planning and physical flow

Suppliers shall have a computerized system allowing for daily and online reception (at least through email) of the SKF purchase orders, call-off orders and forecasts as well as transfers of advance shipment notifications (ASN's) at the time of shipment.

Suppliers shall have an order-driven system, preferably computerized, to control material procurement, production planning and deliveries on a daily operational basis. Suppliers shall have daily and online access to Internet.

Suppliers shall have structured methods to follow up key logistic parameters such as broken promises, lead time and other agreed parameters and shall implement activities for continuous improvements. Broken Promises that do not meet SKF acceptance criteria, will be recorded and "assigned to supplier" by the receiving SKF unit and an official vendor delivery complaint (VDC) will be issued to the supplier.

Plant layouts shall:

- Minimize material travel and handling.
- Facilitate synchronous material flow.
- Maximize value-added use of floor space.

Orderliness and cleanliness of operations and processes shall be maintained and systematically improved. SKF recommend the 5S method for organizing and managing work space.

Specific requirements – indirect materials and services

System and process approval

The quality system and process of all new suppliers of indirect materials and services to SKF shall be approved on the basis of documented evidence of:

- SKF Quality Standard for suppliers commitment and
- at least one of following criteria:
 - Third party registration to ISO 9001 by an accredited third party certification body, having the scope covering the products or services purchased or
 - Supplier evaluation report to assess the capability and level of control of the supplier process with respect to the SKF requirements (specifications, contract,) or
 - current approval from industry recognized customers of this supplier having the scope covering the products or services purchased by SKF.

Approval criteria verification may require visits to supplier's premises.

Product approval

The product approval for indirect materials and services is defined and requested case by case, depending on the relevance and need. It may include SKF request for initial samples to be delivered for evaluation of the product.

Non-conformances identified at SKF

Any product that does not meet SKF acceptance criteria, may be recorded and "assigned to supplier" as an official vendor conformance complaint (VCC) by the receiving SKF unit. In such case SKF will provide a specific "corrective action report (SKF CAR)" format which shall be applied accordingly.

Delivery deviations identified at SKF

Any product (purchase order) that is not delivered as agreed to SKF, generating broken promises potentially causing disturbance in SKF operations, may be recorded and "assigned to supplier" as an official vendor delivery complaint (VDC) by the receiving SKF unit. In such case SKF will expect a thorough root cause investigation resulting in efficient corrective actions to avoid the same issue from happening ever again. SKF may provide a specific investigation format which in such cases shall be applied accordingly.

Specific requirements – capital equipment

System and process approval

The system and process of suppliers of capital equipment shall be approved on the basis of the following documented evidences:

- ISO 9001 certification for the valid scope.
- SKF Quality Standard for suppliers commitment.

Product acceptance

The product acceptance for capital equipment is executed in two steps unless otherwise specified, and these inspections shall reflect verification of the purchasing agreement (including technical specifications) as well as any other relevant and agreed requirement. The two activities are defined as follows:

- Factory acceptance test (FAT) conducted at supplier site.
- Site acceptance test (SAT) conducted at final SKF user site.

If there are any major concerns identified during the FAT test then suppliers are not authorized to deliver the equipment to SKF.

Non-conformances identified at SKF

Any products that fail product acceptance (FAT, SAT) or deviate from purchasing agreement (including technical specifications) during the warranty period may be recorded and “assigned to supplier” as an official vendor conformance complaint (VCC) by the relevant SKF unit. In such cases SKF will provide a specific “corrective action report (SKF CAR)” format which shall be applied accordingly.

Delivery deviations identified at SKF

Any product (purchase order) that is not delivered as agreed to SKF may be recorded and “assigned to supplier” as an official vendor delivery complaint (VDC) by the relevant SKF unit. In such cases SKF will expect a thorough root cause investigation resulting in effective corrective actions to avoid the same issue from happening ever again. SKF may provide a specific investigation format which in such case shall be applied accordingly.

Additional requirements

Suppliers of capital equipment are at minimum required to perform, document and maintain a safety risk assessment per type of equipment in alignment with the ISO EN 12100 standard (Safety of machinery – General principles for design – Risk assessment and risk reduction).

SKF requires the CE marking (European Conformity) when applicable for categories of products being subject to relevant EC directives such as for safety, health, and environmental protection. Suppliers shall upon request from SKF be able to submit their “declaration of conformity” in regards to the CE marking and it shall then include the following information:

- Manufacturers name.
- Full postal address.
- Product description (incl. model and serial number).
- A list of declared EC directives relevant for the scope.
- Name, position and signature of the manufacturer's authorized representative in Europe

Additional requirement to have UL (Underwriters Laboratories Inc.) approval or other similar certification on top of the CE marking can be necessary due to the scope and type of equipment and will in such cases be specifically requested by SKF as part of the technical specification.

Suppliers shall have a system in place to monitor the “End of warranty” deadline in order to notify SKF in due time and agree upon a date for inspection execution within the deadline of the “End of warranty”. Any identified warranty issues found during such an inspection shall be properly addressed and planned for immediate correction by suppliers in a documented action plan to enable for concrete and timely follow up.

Suppliers shall carry adequate product liability insurance covering malfunctioning products at SKF resulting in damage to property, people and/or SKF products.

Definitions

AIAG: Automotive industry action group.

APQP: Advanced product quality planning. A structured method of defining and establishing the steps necessary to assure that a product satisfies the customer. The goal of such planning is to facilitate communication with everyone involved to assure that all required steps are completed on time. See AIAG publications for further explanation.

APQP+: Advanced product quality planning. A more extensive and detailed version of the original APQP set-up execution.

Broken promise (delivery): The date used for measuring a broken promise is either the first acknowledged date or the requested date. A broken promise occurs when the date of receiving is later than the date used for measuring OR if the quantity is less or more than ordered.

Capital equipment: Goods needed for modernization or creation of products and services.

Control plan: It describes the nature and extent of controls that suppliers will implement to ensure that products delivered to SKF conform to agreed product specifications.

Critical characteristic (CC or C): A feature identified by SKF or by suppliers, whose deviation beyond specified tolerances could jeopardize persons or affect compliance with governmental regulations.

D-FMEA: Design failure mode effect analysis. An analytical technique to ensure that any potential failure modes and their anticipated causes have been considered and properly addressed already in the product development phase. See AIAG publications for further explanation.

Direct materials: Products that end up in SKF finished products.

GADSL: Global automotive declarable substance list.

High impact characteristic (HIC or M): A feature identified by SKF on drawings and specifications, whose non-conformance would potentially disturb its final customer

assembly process. All features, which remain as finished once mounted on SKF products, are in general considered as high impact characteristics.

IS/ISIR: Initial sample/Initial sample inspection report.

Indirect materials: Products that do not end up in SKF finished products.

Initial samples: Representative parts of a batch manufactured to agreed product specification, using series production process and inspection plans as described in the Supplier control plan.

Lead time: The time from receiving the order (purchase order or call-off order) at the suppliers' premises to goods arriving at the SKF manufacturing site or at another location as otherwise agreed with SKF. If suppliers supply from stock, the stock replenishment lead time shall also be measured separately.

MSA: Measurement system analysis. A method to analyze the variation causes in a relation between the measurement system itself and the environment influencing it. See AIAG publications for further explanation.

OEM: Original equipment manufacturer.

Outlier: A faulty product of sporadic occurrence being abnormal to the accepted standard, which is unfit for use and/or may cause an adverse customer reaction.

P-FMEA: Process failure mode effect analysis. An analytical technique to ensure that any potential failure modes and their anticipated causes have been considered and properly addressed. See AIAG publications for further explanation.

PPAP: Production part approval process. The purpose of PPAP is to determine if all customer engineering design record and specification requirements are properly understood by the organization and that the manufacturing process has the capability to produce product consistently meeting these requirements during an actual production run at the quoted production rate.

Product: Materials, components or services

Process flow chart: A unique schematic diagram covering all process steps from receiving materials to delivery, including subcontracted operations.

QCDIM: Quality, cost, delivery, innovation, management. SKF supplier key performance indicators.

QMS: Quality management system.

REACH: Registration, evaluation, authorization and restriction of chemicals. An EU directive on the regulation on chemicals and their safe use.

RoHS: Restriction of hazardous substances. An EU directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

SKF CAR: SKF corrective action report. The SKF document template for structured and systematic problem solving.

SKF NSDC: SKF New supplier delivery concept.

SKF QT3: SKF Certification audit.

SPC: Statistical process control. A simple method to detect special causes and extent of variation present in the process over time. See AIAG publications for further explanation.

Significant characteristic (SC or R): A feature identified by SKF or by suppliers, whose deviation beyond specified tolerances could jeopardize products or processes or reduce lifetime or utility.

TPM: Total preventive maintenance.

VCC: Vendor conformance complaint.

VDC: Vendor delivery complaint.

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