



Global Supplier Manual



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1 Preamble

ThyssenKrupp Elevator is one of the world's leading elevator companies. With sites all over the world, ThyssenKrupp Elevator has global presence. ThyssenKrupp Elevator's aim is to continue to grow strategically and profitably. Innovation and quality are hallmarks of ThyssenKrupp Elevator's products and services and assure lasting customer relationships. Profitability, innovation, quality and reputation are very much determined by components and services ThyssenKrupp Elevator is sourcing externally. A balanced, competitive and capable supply base is key element for success. For more information about ThyssenKrupp Elevator, for general information please go to www.thyssenkrupp-elevator.com and to download the Code of Conduct to [TK Code of Conduct for Suppliers](#).

1.1 General purpose of the document ■ ■ ■ ■

With this “**Global Supplier Manual**” ThyssenKrupp Elevator is clearly communicating expectations and requirements towards its supply base. It can be understood as a guideline on how to do business with ThyssenKrupp Elevator and will be the basis for a professional business relationship, which is crucial to be competitive and successful in a global market environment. Since this is a meaningful addition, the Global Supplier Manual shall be a substantial part of every supply agreement. In case of conflicts with existing contracts, those remain valid as agreed.

1.2 Validity and applicability ■ ■ ■ ■

This document is valid and applicable to all companies belonging to the business areas Elevator Technology, hereinafter “ThyssenKrupp Elevator”. The applicability of this “Global Supplier Manual” for each supplier varies by “scope of delivery” of ThyssenKrupp Elevator's suppliers and is outlined and color-coded¹ in the matrix below. If in doubt, the supplier is requested to actively seek for clarification with ThyssenKrupp Elevator concerning the relevant category:

Chapter	Product related Services	Catalogue / “off the shelf” items	Raw Materials & Components	Assemblies & Systems
1 Preamble	X	X	X	X
2 General requirements	(X)	X	X	X
3 Project Management	0	0	(X)	X
4 Quoting & supplier nomination process	X	X	X	X
5 Product development	0	0	(X)	(X)
6 Sampling and prototyping	0	(X)	X	X
7 Product qualification and approval	0	X	X	X
8 Process development (Industrialization)	0	0	X	X
9 Production	0	X	X	X
10 Logistics	0	X	X	X
11 Tooling	0	0	(X)	(X)
12 Claim Management and escalation	(X)	X	X	X
13 Severability	X	X	X	X
14 Appendix	X	X	X	X

¹⁾ [0 = not relevant, x = relevant, (x) = conditionally relevant]

2 General requirements

2.1 Customer orientation



At ThyssenKrupp Elevator we believe in working together with our suppliers in a partnership based relationship. To be successful in a global market environment ThyssenKrupp Elevator expects from its supply base to strive for understanding and continuously meeting the expectations. A strong customer orientation, professional behavior in all phases of a business relationship, excellent expertise and a pro-active involvement in the relevant business areas is important to ensure mutual success.

2.2 General Terms & Conditions



For all deliveries from suppliers and services conducted from service providers the “General Terms and Conditions” of the specific ordering ThyssenKrupp Elevator group company apply and shall precede this “Global Supplier Manual”.

2.3 Business ethics



ThyssenKrupp Elevator as part of ThyssenKrupp is participating in the Global Compact of the United Nations which is the world's largest network for sustainability. Thus we are committed to adhere worldwide to the ten principles set by the Global Compact. For more details please refer to www.unglobalcompact.org. Furthermore, we expect that our suppliers comply with applicable national statute, with the principles of the United Nations Global Compact, and with the ThyssenKrupp Supplier Code of Conduct. For more details concerning the ThyssenKrupp Supplier Conduct please refer to [TK Code of Conduct for Suppliers](#).

2.4 Compliance



At ThyssenKrupp, we expect our suppliers to have zero-tolerance for corruption and to ensure compliance with all United Nations (UN) and Organization for Economic Cooperation and Development (OECD) conventions against corruption, and with all governing anti-corruption laws. In particular, our suppliers are expected to ensure that their employees, subcontractors and agents do not offer, promise or grant any advantages to any ThyssenKrupp employees or related parties with the goal of securing an order award or any other form of preferential treatment in their business transactions.

At ThyssenKrupp, we expect that our suppliers refrain from presenting any invitations or gifts to our employees so as to gain any form of influence. Any invitations or gifts extended to ThyssenKrupp employees or related parties, if any, must be reasonable and suitable with a view to scope and design, i.e. they must be of low financial value and reflect ordinary local business custom. We also expect our suppliers to refrain from asking ThyssenKrupp employees or related parties for any inappropriate advantages. In our suppliers' business dealings with us, we expect our suppliers to take decisions based on objective criteria only. Any factors that might influence our suppliers' decisions due to private, business or other conflicts of interest must be prevented from the start. The same applies to relatives and other related parties.

At ThyssenKrupp, we expect our suppliers to always compete in a fair manner and to comply with applicable antitrust laws and regulations. Our suppliers are expected not to enter with competitors into agreements that might constitute a breach of antitrust law, nor to take advantage of any dominant market position they might hold.

At ThyssenKrupp, we expect our suppliers to comply with all applicable statute governing the prevention of money laundering, and not to participate in any money laundering activities.

At ThyssenKrupp, we expect our suppliers to communicate the principles laid out herein to their subcontractors and sub-suppliers and to take these principles into account when selecting subcontractors and sub-suppliers. Our suppliers are expected to encourage their subcontractors and sub-suppliers to comply with the minimum standards of this Code of Conduct regarding the protection of human rights, working conditions, anti-corruption and environmental protection when fulfilling their contractual obligations.

2.5 Confidentiality



Confidential information shall mean all technical (including specifications, computer code, inventions, algorithms, know-how and ideas), business, financial, marketing, strategic information and any other information (whether written, oral, graphic, machine recognizable, sample or visual), which is marked „confidential“, is stated to be confidential, or by its nature is intended to be confidential and that is disclosed by ThyssenKrupp Elevator to the supplier. As the unauthorized use or disclosure of any confidential information to any third party may result in irreparable and continuing damage to ThyssenKrupp Elevator, suppliers shall maintain such Confidential Information in confidence and not disclose it in any way whatsoever, in whole or in part without prior written approval by ThyssenKrupp Elevator. The supplier may be requested to sign an NDA (non-disclosure agreement).

2.6 Required quality management system certification level



ThyssenKrupp Elevator expects its suppliers to introduce and deploy a Quality Management system in accordance with the standard ISO 9001:2008 or comparable and have this confirmed by an accredited certified body. The supplier should furnish the ordering ThyssenKrupp Elevator Company with evidence of its most up-to-date certification status at any given time in writing in form of a copy of the certificate. Any changes to the certification status are to be notified to the relevant Purchasing Manager at ThyssenKrupp Elevator within 5 working days. Achieving a certain quality management system level is to ensure that the common zero-defect objective is targeted. The supplier is expected to conduct internal audits to verify compliance of processes as laid out in the overall quality management system. ThyssenKrupp Elevator reserves the right to audit the supplier's quality management system, methods/processes and products or to have these audited by third parties. Representatives of the respective ThyssenKrupp Elevator entity or ThyssenKrupp Elevator AG are to be allowed to access the supplier's site during standard business hours following prior notice.

2.7 Financial stability



Financial stability is a key for successful business in today's business environment. ThyssenKrupp Elevator's suppliers:

- with a sales volume to ThyssenKrupp Elevator > 100.000 €/a or
- suppliers manufacturing parts out of subsidized tooling

are expected to provide proof of their financial stability (e.g. by D & B certification) uncalled and on a regular basis (at least once per year).

2.8 Quality objectives, Quality targets



The supplier should work towards a "zero-defect strategy". To measure and make quality performance transparent, the supplier shall specify internal and external quality objectives (defect rates, scrap rates, rework rates, internal and external quality costs, control plan etc). Measures in the event of the objectives not being attained shall also be specified. The quality objectives/escalation levels shall be adjusted annually in order to guarantee the continuous improvement process. Individual ThyssenKrupp Elevator Companies may enter into a separate Quality Assurance Agreement with a supplier to specify requirements on component (group) level as needed.

2.9 Incoming goods inspection at ThyssenKrupp Elevator



The supplier guarantees that all product deliveries meet the requirements laid down in drawings and specifications according to the applicable contract or as otherwise agreed upon. This is to be ensured by controllable, capable and repeatable processes as well as suitable test methods installed at the supplier's premises. ThyssenKrupp Elevator restrains the incoming goods inspection to a rough visual check of identity, visible external damages, quantity as well as completeness and supply of supporting documents, such as drawings, specifications or test reports. During ramp up of new products, ThyssenKrupp Elevator may include specific characteristics through skip lot checks for a preliminary period of time.

2.10 Conformance with laws and standards



Suppliers shall comply with applicable laws and standards.

2.11 Continuous improvements



To stay competitive in a global market environment it is necessary to constantly improve the products, production processes and business processes in general. The main goal is to create a structure and mindset striving to make noticeable improvements through suitable methods (e.g. Kaizen) and measurable operating figures for all relevant aspects of the business along the supply chain. Sustainability, efficiency, quality improvements and cost effectiveness are the most important aspects of continuous improvement and should be openly communicated as part of the business relationship. Individual ThyssenKrupp Elevator Companies may agree on specific goals with the supplier to drive a sustainable cost improvement process.

2.12 Change management



The suppliers are required within their projects, products and processes to apply an accurate change management. Changes are to be documented and managed compliant to ISO 9001:2008 or comparable standards. Changes affecting ThyssenKrupp Elevator as a customer are to be communicated in written form and need to be approved by ThyssenKrupp Elevator. Costs occurring within the change management process are generally managed following the root-cause-principle, unless otherwise agreed up front. Changes to 3rd party or notified body approved products and components are not allowed without re-approval by 3rd party / notified body.

2.13 Lessons learned



The goal of “Lessons learned” by/with suppliers or service providers is to ensure that past experiences are implemented in new projects and products. Expertise from development, production, customer complaints and research projects can be utilized. Tools of use include knowledge databases, FMEA databases, design guidelines and standards. ThyssenKrupp Elevator expects that applicable systems are applied for the improvement of subsequent projects.

2.14 Supplier performance rating



The supplier performance is monitored continuously and along all phases of a business relationship with ThyssenKrupp Elevator. Prior entering into a business relationship with a supplier ThyssenKrupp Elevator may conduct an E^Q assessment, which is a unique global supplier evaluation and qualification method of the supplier's quality management system. Depending on the scoring achieved within this cross functional assessment by ThyssenKrupp Elevator, the supplier may be awarded with a certificate testifying professional or world class performance. The certificate is valid for two years and will be renewed based on ongoing performance level. Within an existing business relationship, the suppliers' performance will be monitored continuously (e.g. monthly, semi-annually or annually) by the ordering companies. The criteria of the supplier ratings are primarily quality, delivery performance, competitiveness and service level. ThyssenKrupp Elevator will inform its suppliers about the results. Should the suppliers performance level not meet ThyssenKrupp Elevator's expectation, the supplier is requested to initiate improvement measures in order to improve within an appropriate period of time. A satisfying level of risk containment may be requested by ThyssenKrupp Elevator for the time which is needed to bring the performance back into an acceptable range. Evidence of improvements are to be submitted to ThyssenKrupp Elevator in all phases. Should a supplier be unable to manage and drive an improvement process on its own, ThyssenKrupp Elevator may offer some guidance or mentorship in such process. The supplier performance will certainly have an impact on existing business and on future sourcing decisions. Ongoing performance issues may lead to a "New Business Hold" status or initiate resourcing activities.

2.15 Supplier audits



ThyssenKrupp Elevator reserves the right to verify the effectiveness of the supplier's quality management system through on site audits. The audits will be conducted with prior notice and with focus on those areas which are relevant for ThyssenKrupp Elevator's scope of products / scope of service. Audits may be scheduled on a routine basis or driven by quality issues as part of an escalation process. In some cases audits at sub-suppliers may be required as well, nevertheless, the supplier is generally responsible for auditing sub-suppliers. Different types of audits may be conducted such as system audits (based on ISO 9001:2008 or comparable), product (PPAP or comparable) or process audits (first parts yield, run@rate). In the area of service providers to ThyssenKrupp Elevator the audit activities may include as well health and safety assessment at the job site.

2.16 2nd tier suppliers [sub-suppliers]



ThyssenKrupp Elevator's suppliers shall pass on all relevant requirements as stated in this document or as communicated through specifications, drawings etc. to the 2nd tier suppliers (sub-suppliers) and ensure compliance through audits, tracking of quality figures, supplier ratings etc. ThyssenKrupp Elevator may request 2nd tier supplier audits and reserves the right to join with prior notice.

2.17 Staff qualification level



The staff qualification level on the suppliers' side should be suitable for the individual jobs and/or project assignments. This would require in key functions a certain skill level. In order to maintain this qualification level, appropriate (internal/external) training needs shall be identified and consequently conducted and tracked accordingly.

2.18 Sustainability



As a global company, ThyssenKrupp Elevator is committed to protect the environment, to conserve energy and resources and to act socially and economically responsibly, also for the benefits of future generations. Within the context of a global sustainable efficiency program ThyssenKrupp Elevator has made sustainability one of the guiding principles. Sustainability is the overlapping part of its three main pillars people, planet and profit (social, environmental and economic sustainability) and therefore part of every company's activities and responsibilities, covering employees, customers, stakeholders, shareholders, suppliers and partners. Within the Sustainable Efficiency Program at ThyssenKrupp Elevator, suppliers may be audited or asked to provide specific information in order to evaluate their performance in those aspects mentioned above. In the following paragraphs sustainability elements will be described further more in detail.

2.19 6-S, Cleanliness



Cleanliness and well organized work environment including ergonomic aspects is key to ensure work safety and quality of products and services. The ThyssenKrupp Elevator definition of "6-S" is as listed below:

- Sort
- Straighten
- Shine
- Standardize
- Sustain
- Safety

The supplier shall follow the basic 6-S principles and perform 6-S workshops on a regular basis.

2.20 Health & Safety



Health and safety of customers, employees and contractors is one of the major goals of ThyssenKrupp Elevator. All suppliers for services and products need to comply with the ThyssenKrupp Elevator Health & Safety Guideline (latest version will be provided with each request for quotation) and local laws and regulations. In case services are provided on jobsites or in manufacturing areas, the effective rules and regulations of these areas need to be followed in all cases. Suppliers are asked to implement and follow a sufficient Health & Safety management system according to OHSAS AS 18001 or comparable standards. In case of violation of the safety rules on job sites or other ThyssenKrupp Elevator operated areas comes to ThyssenKrupp Elevator's attention, it will lead to an immediate exclusion of the respective individual and may have contractual and legal consequences.

2.21 Environment



The suppliers and service providers of ThyssenKrupp Elevator are requested to continuously and efficiently improve the environmental situation in pursuance of international environmental management standards such as ISO 14001, REACH, GRI, LEADS and others. The requirement applies throughout the entire supply chain. It is the duty of the supplier to comply with current legal, state, country and branch of industry related regulations concerning environmental protection and recycling as a minimum requirement.

2.22 Guarantee, Warranty



The applicable law shall apply. ThyssenKrupp Elevator may expect the supplier to guarantee the products' functional and operational capability for a certain period of time/ cycles / operations/ hours beyond obligations according to the relevant law. This shall be agreed upon separately and product specific. If there is a malfunction within this period the supplier shall be liable for all direct and indirect damages and expenses. Concerning stipulations on warranty ThyssenKrupp Elevator may enter into a contractual agreement with the supplier.

2.23 Liability



ThyssenKrupp Elevator will hold its suppliers including service providers liable according to the applicable law for damages and expenses caused by the suppliers' product(s) and services. The supplier shall as a minimum requirement limit the financial risks by maintaining adequate insurance covers for public liability and product liability. Upon request the supplier shall provide evidence of insurance coverage.

2.24 Contact information



In all relevant areas of a business relationship with ThyssenKrupp Elevator the supplier is requested to provide sufficient and up to date contact information, preferably in electronic form.

2.25 Official business language



Official business language at ThyssenKrupp Elevator is English and should be used in all global matters or business affairs involving multiple entities. However for local/regional business activities and in day to day operations national language of the specific ordering ThyssenKrupp Elevator group company is acceptable.

2.26 Communication / exchange of data



Pro-active and frequent communication and exchange of relevant data is essential for a successful business relationship. Choosing the most suitable communication channels and –ways will ensure efficient information flow. The supplier shall agree with his counter parts on the ThyssenKrupp Elevator side a reasonable and feasible communication concept.

2.27 Documentation, document control



Within the overall quality management system the supplier should ensure appropriate documentation and document control (revisions, change management, archiving [at least product life time period], back up etc.). Compliance in this area may be subject to an audit.

2.28 Data management



Data management and data security is crucial in today's business. Besides compliance with general data safety regulations, ThyssenKrupp Elevator's suppliers are requested to maintain a state of the art data management system and appropriate security infrastructure for hardware, software and data transmission (assignment of dedicated staff members may be required). The supplier is obligated to inform ThyssenKrupp Elevator upon any irregularities regarding (suspected) breaches of data protection. ThyssenKrupp Elevator is entitled to audit whether the regulations of the applicable legislation regarding data security measures - as far as ThyssenKrupp Elevator's personal data is concerned - are observed. ThyssenKrupp Elevator can task the Department Labor Law & Data Privacy with this audit. The supplier collects, processes and uses personal data solely for the establishment or alteration of the contractual relations in question. Aside from the provision of the applicable data protection legislation and the information security policies of the ordering ThyssenKrupp Elevator site, special regulatory provisions regarding telecommunication and/or telemedia may be applicable. Upon the termination of the contractual relation all of ThyssenKrupp Elevator's personal data has to be handed over to ThyssenKrupp Elevator by supplier or – after ThyssenKrupp Elevator's choosing – to be deleted by supplier. The supplier has to give written confirmation about the treatment of the data. If specified by applicable law (e.g. § 11 Bundesdatenschutzgesetz = German data privacy law), a written contract for commissioned data processing has to be signed in addition to the Service Level Agreement. In this contract, ThyssenKrupp Elevator – as the entity responsible for the rightfulness of the data transfer – has to specify its instructions for the data processing. The above mentioned instructions have to be given by ThyssenKrupp Elevator in written form prior to service delivery. The Supplier has installed procedures in compliance with the applicable data privacy legislation and will only use subcontractors for the processing of personal data upon written approval of ThyssenKrupp Elevator of the subcontractor prior to the engagement. The supplier accepts that ThyssenKrupp Elevator may submit supplier's personal data (such as contact data or persons affiliated with supplier) into a global database that is used by all ThyssenKrupp group companies. A similar database for contractual details is accessible to all ThyssenKrupp group companies. This should avoid any miss-use or theft in the process of exchanging or archiving data and information (ThyssenKrupp Elevator's internal guidelines comply with DIN EN ISO 27001 and 27002).

3 Project management

3.1 Project planning and methods



For all major projects with ThyssenKrupp Elevator the supplier shall compile project plans that serve to secure project results in line with the specifications set forth, such as setting of deadlines, scope, contents, format and responsibilities. The key milestones important to the supplier and ThyssenKrupp Elevator as a customer shall be agreed upon in due time with the responsible project management. Appropriate and state of the art project management methods need to be deployed and aligned with the relevant ThyssenKrupp Elevator group company.

3.2 Project reviews ■

The supplier shall, within the scope of internal project reviews compare the current status of the project with the desired goals and record the results. ThyssenKrupp Elevator as a customer is to be advised, in the manner agreed, of the progress of the project and any eventual problems or risk that may occur. Trouble-free implementation within the agreed deadlines is a priority requirement of ThyssenKrupp Elevator. Joint project reviews will be conducted together with ThyssenKrupp Elevator at milestones to be determined. In case of deviations appropriate measures with clearly defined responsibilities are to be initiated, communicated and documented.

3.3 Critical path evaluation, risk assessment ■ ■

In order to limit the risk of failure in projects, the critical path within a project needs to be identified and an appropriate risk assessment should be conducted and risk containment measure initiated. Should the project scope or external circumstances change, a re-evaluation is required and to be addressed in a timely manner.

3.4 (Advanced) Product quality planning ■

Besides choosing a general suitable approach to manage overall project activities, specific product quality planning efforts should be included. All relevant elements within a product life cycle such as design, prototyping, testing, industrialization, measurements, production launch and finally lessons learned shall be included. Advanced product quality planning [APQP] already used in many areas even outside the automotive industry may serve as guidance within these activities.

4 Quoting and supplier nomination process

4.1 RFI/ RFP process (incl. e-commerce) ■ ■ ■ ■

ThyssenKrupp Elevator requests for information (RFI) or requests for proposal / quotation (RFP/RFQ) are generally placed in the markets through the relevant purchasing departments. There are different forms of requests, such as written requests sent via mail /electronic mail or requests made via e-commerce platform. ThyssenKrupp Elevator's suppliers are being asked to respond to those requests meeting the defined due date and with the level of detail as requested. Any questions or comments concerning a request should be directed to the contact persons at ThyssenKrupp Elevator as mentioned in the submitted forms. The quality of response to requests being made by ThyssenKrupp Elevator will have an influence on any sourcing decision.

4.2 Feasibility statement ■ ■ ■ ■

The supplier shall examine the feasibility of the goods/services he is going to offer through a feasibility study. Besides the technical feasibility (manufacture of the parts under series conditions in line with the specifications and the required process capability), this also encompasses such aspects as logistics, quality, deadlines, cost, readily available capacities, compliance with environmental regulations etc. Feasibility is to be proven by the supplier to ThyssenKrupp Elevator along with the submission of an offer.

4.3 Supplier nomination

ThyssenKrupp Elevator will nominate suppliers in written form, e.g. through a letter of intent, an individual contract, a (blanket) purchase order or logistics release.

4.4 Order confirmation

A written order confirmation is to be submitted automatically by the supplier within 1 - 3 working days. The supplier, in examining the order, is requested to confirm the following contents of a purchase order such as document revision level, delivery date, destination, pricing and payment terms, General Terms and Conditions. Receiver of the order confirmation is the ordering group company. Should the supplier miss to send an order confirmation, this does not relieve the supplier from his obligation to deliver according to the purchase order.

4.5 Competitiveness

To prevail in today's competitive business environment, ThyssenKrupp Elevator requires its suppliers to constantly drive the improvement of the cost effectiveness across the entire supply chain, including sub-suppliers. To increase competitiveness, all areas should be addressed starting with increased cost transparency, exploring new production and process technologies, substitution of materials, reviewing the internal and external logistic set up etc. These efforts certainly can be a collaborative approach involving ThyssenKrupp Elevator, however changes must receive approval.

5 Product development (for suppliers with design responsibility only)

5.1 Design and layout

The following agreements shall be made and documented by the supplier's project manager/ engineer and the respective ThyssenKrupp Elevator project manager:

- Definition of development targets and product or process quality objectives
- Definition and alignment of technical interfaces
- Design rights and rights of utilization (intellectual properties)
- Document responsibility; document management (e.g. D-FMEA, DoE, drawings, specification or performance specification)
- Change management, part/ tool history documentation
- State of the art product validation/ process verification as part of the industrialization process

5.2 Methods and techniques

Suppliers with design responsibility shall use state of the art design methods and tools. A compatibility check with ThyssenKrupp Elevator's research and development infrastructure should be performed in advance.

5.3 Calculation and simulation



Based on given specifications and requirements called out in validation plans, the supplier shall prove by calculation that the product meets the requested characteristics as e.g. tensile strength, reliability, safety, feasibility and functionality. This can be established by dynamic/kinematical simulation on CAD, life-cycle analysis, distortion calculation (FEM), mold flow analysis or similar.

5.4 Design FMEA



Suppliers with development tasks assure basically a systematic and comprehensible analysis of the risks associated with the product utilization and possible malfunctions throughout the product's period of use. For this purpose, Design FMEA (Design- Failure Mode and Effect Analysis) are to be carried out in order to ensure that potential problems are detected at an early stage, thus enabling appropriate preventive steps to be taken (design iterative). ThyssenKrupp Elevator set forth clear internal guidelines concerning FMEA requirements, therefore if relevant, an "Interface-FMEA" will be carried out jointly with ThyssenKrupp Elevator.

5.5 Specific characteristics



By conducting a Design FMEA specific characteristics (as well named as key characteristics or special features) are being identified. These specific characteristics are crucial for function, safety, subsequent processing and assembly etc. and require special attention. They will be marked in drawings as such and represent the basis for process capability examinations, work and test planning, process regulation, QM-verification etc. Special characteristics are to be monitored and documented in an understandable manner using appropriate methods (e.g. SPC for mass production, 100 % check for small series production).

5.6 Technical documentation



The technical documentation is to be agreed upon between ThyssenKrupp Elevator and the supplier prior to the placement of the order/ start of a project concerning content, format, process, methodology, distribution and submission of information and data etc.

5.7 Design reviews



The supplier must conduct design reviews at certain points of time (milestones, quality gates). The development results presented will be systematically analyzed during the design reviews to establish the extent to which the specifications / development targets defined have been met. The procedure for design reviews will be coordinated between the supplier and ThyssenKrupp Elevator project management. For key development projects those need to be aligned with milestones of ThyssenKrupp Elevator's internal Standard Product Development Process (SPDP). Reviews are to be documented accordingly.

5.8 Design verification and validation



Unless otherwise agreed upon, design verification and validation are to be carried out by the supplier. In doing so, the supplier must prove that the product developed meets the specifications set forth. The manner in which design verification and validation is carried out and documented is to be coordinated with ThyssenKrupp Elevator and to be captured in a so called PV-plan (product validation plan). ThyssenKrupp Elevator requires as well the proof that the product adheres to the specific laws and norms of its destination country. In the event that homologation is to be carried out, the appropriate competencies are to be coordinated and fixed at the time orders are placed.

6 Sampling and prototyping

6.1 *Production of prototypes* ■ ■

The same technologies, processes and sub-suppliers, including their processes, used for series production, should also be employed, to the extent possible, for the production of prototypes. Deviations from the planned series production are to be documented and communicated with ThyssenKrupp Elevator accordingly. In some cases special techniques as e.g. rapid prototyping may be requested.

6.2 *Prototype documentation, testing of trial samples* ■ ■ ■

The prototype parts, assemblies and aggregates that need to be tested, must be documented properly over the whole value chain (manufacturing, assembly etc.). All reworking, repairs and similar carried out on prototype parts are also to be documented. The scope of documentation is to be agreed upon between the supplier and ThyssenKrupp Elevator project management. The supplier may only deliver prototypes if they comply with the specifications. If necessary, test features shall be agreed with ThyssenKrupp Elevator.

7 Product qualification and approval

7.1 *Qualification programs* ■ ■ ■

The testing programs, procedures and methods, basis of measuring, reference points, documentation, evaluation etc. are to be coordinated in a timely manner between the supplier and ThyssenKrupp Elevator and to be documented accordingly. The development of a qualification plan, including sub-supplier part qualification, component and product qualification must be developed by the supplier as part of the project management and be available at the agreed milestone reviews with ThyssenKrupp Elevator. Industry relevant regulations and codes need to be considered (see appendix). The supplier is required to follow the qualification plan and must report any deviations that could bear a risk to the project execution immediately.

7.2 *First article inspection process requirements* ■ ■ ■

First article inspection samples are products produced and tested under serial conditions (machinery, plant, operation and test equipment, processing conditions). The supplier shall conduct the production process and product release per specific requirements of specific ordering ThyssenKrupp Elevator Group Company. The test results of all features are to be documented in a first article inspection report (FAIR). The number of parts to be documented is to be agreed upon. The first article samples are to be sent to the address indicated in the order, accompanied by the initial sample inspection report / documents and shall be clearly identified as such. Only "OK parts", (O.K. meaning parts evidently meeting ThyssenKrupp Elevator's requirements to full extend) from serial production may be sent as samples for FAIR to ThyssenKrupp Elevator. First article shipments missing the relevant documentation will not be processed. The approval (or denial) will be submitted in written form by ThyssenKrupp Elevator in a timely manner.

7.3 Re-qualification



For key components or for safety relevant products, the supplier is obliged to carry out re-qualification testing (complete or agreed measurement of all the required features) of the products to be supplied, including documentation of the results. Scope and frequency should be agreed upon with the relevant ThyssenKrupp Elevator group company. The re-qualification may include measurements and functional features such as service life, engineering strength, wear and corrosion resistance. The result documentation must be available on request. Found deviations must be reported to ThyssenKrupp Elevator immediately to decide on corrective actions and material in process or at the customer. Costs associated with the re-qualification are carried by the supplier.

8 Process development (Industrialization)

8.1 Manufacturing concept



Based on the requirements received from ThyssenKrupp Elevator and utilizing its specific process know how the supplier should plan and establish a feasible, efficient and ecological manufacturing concept. This concept should be flexible enough to adjust to product changes in a reasonable range.

8.2 Process FMEA



The supplier must analyze his manufacturing processes by means of a process FMEA. The process FMEA must, as a minimum, take into account the reliable manufacturing of specific characteristics (same as key characteristics), along with the required process capability. The procedure to be adopted in connection with the FMEA shall be agreed upon between the supplier and ThyssenKrupp Elevator. ThyssenKrupp Elevator requires a brief but comprehensible presentation of the Process FMEA results by the supplier. The supplier has to assure ThyssenKrupp Elevator at least access to the created FMEA. If improvements have been determined, the supplier has to consider them in the FMEA and implement the improvements.

8.3 Critical processes and technologies



The supplier has to identify critical processes and technologies (which also include bottle neck analysis) in his production. Hereby the supplier has to take appropriate measures to achieve the required output and process capability by detailed planning, process analysis, identification and definition of “specific characteristics“, that is characteristics with increased importance for the process and important process parameters, process release for series production, process monitoring and regulation, immediate measures at deviations, etc.

8.4 Process control, Statistical process control (SPC)



The manufacturing process control has to include the monitoring of the product characteristics and process-influencing parameters. For this, appropriate methods like e.g. SPC (applicable when statistically representative quantities are being manufactured) have to be employed. The process parameters complying with this regulation have to be defined in the control plan and documented in an appropriate form. ThyssenKrupp Elevator requests proofs of stability and process capability at least for critical safety related characteristics and “specific characteristics” as defined in drawings. The general principle of prevention before error detection applies here!

8.5 Process capability ■ ■

Appropriate process analysis and process capability investigations have to be conducted, short and long term, for achieving and providing evidence of process control and capable processes accordingly. This applies for “Specific Characteristics” as defined in product drawings. ThyssenKrupp Elevator’s requires:

- For provisional (short term) process capabilities (ppk) / machine capabilities (cmk), target shall be 1,67. In case of deviation to the target a step up plan must be defined.
- For the continuous process capability (cpk), target shall be 1,33. In case of deviation to the target a step up plan must be defined.
- Quality critical characteristics should be agreed upon with the Quality Management of ordering ThyssenKrupp Elevator Group Company.
- For attributive characteristics equivalent indexes and limiting samples respectively have to be jointly agreed upon with the Quality Management of ThyssenKrupp Elevator. The process capability has to be proven here by control of the process defining parameters.
- For processes that are not stable and capable, special measures have to be defined, which assure the implementation of the requirements (e.g. protection by 100 % verification).

For all characteristic applies basically the zero defect target.

8.6 *Initial production process approval* ■ ■

The initial process approval is part of the first article inspection process and will be documented within this scope.

8.7 *First part yield, Run@rate* ■ ■

The supplier is required to prove through appropriate methods serial production readiness. This could be a first pass yield or run@rate conducted for the first production lot proving:

- the capability and control of his current production processes
- that the products comply with the quality requirements
- that the planned quantities are to be produced under series conditions
- that the production and quality schedules comply with ThyssenKrupp Elevator’s expectation

All production facilities, personnel and support systems, as well as cycle times, must correspond to series production conditions when pilot lots are produced.

8.8 Launch management



With an overall focus to achieving trouble-free serial start-up production, ThyssenKrupp Elevator expects its suppliers to manage the introduction of (a) new product(s) or the ramp up of a new production.

Besides the relevant part/ component and process approval processes the supplier is required to:

- thoroughly plan any new product launch or start up of a new production
- investigate capacity and capability (e.g. first part yield, run@rate)
- plan a feasible logistic concept (internally and externally)

The launch management should be guided and supported by an appropriate risk assessment.

8.9 Launch containment



ThyssenKrupp Elevator asks its suppliers to respond to risks detected within the launch management process in an appropriate manner. Variant to containment measures (as described in chapter 12.4) in case of a quality claim, the so called “Launch Containment” has a preventative characteristic versus a reactive intention. Within the Launch Containment, certain areas will require special attention, which means this could be more increased level of documentation, more frequent and in depth quality checks during ramp up, temporarily tightened tolerance ranges etc. The explicit measures should be captured and documented in a launch containment overview which is shared with ThyssenKrupp Elevator on demand. After successful deliveries the conditions of the “Launch Containment” will be removed step by step. In case of unsuccessfully / non conformance deliveries the conditions will remain.

9 Production

9.1 Production process



ThyssenKrupp Elevator expects its suppliers to apply feasible, capable and efficient (lean) production processes in general but specifically for the product range to be delivered to ThyssenKrupp Elevator. Prevention of quality issues should come before detection of quality issues. All production processes should comply with local national regulations (Health & Safety, Environmental aspects ...) of the receiving ThyssenKrupp Elevator Company. The production process should be visualized in process flow charts. Within an overall control plan the system and the product control processes should be documented by listing the individual test steps, testing devices and test frequencies.

9.2 Production process release



With ramp up of every new production (e.g. start of shift, tool changeover, equipment maintenance), the production process (set up) needs to be released.

9.3 In process control



Features may have been detected from the Process FMEA which can be classified as key to quality characteristics, in this documents named as specific characteristics. Considering the results of process capability studies, in process control steps need to be laid out and established accordingly.

9.4 Measurement systems / devices



Measurement systems and measurement devices need to be designed and configured designed characteristics of the measurement system itself in order to satisfy ThyssenKrupp Elevator quality requirements. A Measurement System Analysis (MSA) should be conducted to ensure that the right measurement and approach is selected, measurement procedures are laid out correctly and the measurement uncertainty of individual devices or systems is calculated. MSA includes as well calibration studies, components of variance, attribute gage study, gage R&R and others. To avoid redundant work, MSA per part family is certainly a valid option. The supplier has to ensure that all measuring devices follow the results of the MSA and are calibrated and maintained in a manner to ensure accuracy of results.

9.5 Emergency strategy



The supplier shall develop and provide an appropriate emergency strategy to guarantee that the products delivered on time and in the agreed quality, even in the event of unforeseen events. Should the delivery to ThyssenKrupp Elevator be in jeopardy, the supplier shall inform ThyssenKrupp Elevator immediately and propose countermeasures to meet original targets. The additional costs of special measures to maintain production or services and to guarantee the delivery of the correct number of products to the customer and on schedule are to be borne by the supplier. ThyssenKrupp Elevator is recommending its suppliers to reserve sufficient stock levels of components, ensure availability of back up production capacities or resources to provide replacement supplies or services in a timely manner based on their risk analysis, emergency plan and general situation.

9.6 Changes in the manufacturing process



Changes in the manufacturing processes of the suppliers and sub-suppliers which can lead to changes in the product characteristics (general affecting form/ fit or function [e.g. geometry, mechanical properties, tensile strength, durability, machining]) require ThyssenKrupp Elevator's approval prior to their implementation. Changes need to be processed in compliance with the requirements of a "state of the art" quality management system.

9.7 Maintenance of production equipment



Maintenance of production equipment is crucial to ensure at all times a 100% availability of the production equipment at the required production rate and with the required level of quality. Maintenance should be conducted by qualified personnel only with appropriate planning to ensure compliance with health & safety relevant aspects. The maintenance should be documented accordingly. Perishable components of specific equipment and crucial items (to be determined with the equipment vendor) should be held readily available to have short lead times to ensure short term recovery of production readiness.

9.8 Preventative maintenance



In order to avoid unnecessary shutdown times of equipment ThyssenKrupp Elevator recommends its suppliers to establish a preventive maintenance schedule, which means regular service and maintenance prior to the occurrence of malfunction or failures. The schedule is to be established based on experience and equipments builder guideline and documented accordingly.

10 Logistics

10.1 Logistic concept



Together with the relevant contact person(s) at the individual ThyssenKrupp Elevator sites, the supplier is required to agree on a feasible, efficient and ecological logistic concept. This includes areas as the selection of transportation means, way of packaging, routing scenarios, shipping frequency, warehousing concepts, traceability, data- and information management. The above criteria are relevant for all new business being set up, but certainly may be applied as well to improve existing logistics process.

10.2 On time delivery



ThyssenKrupp Elevator expects 100 % on time delivery from its suppliers. In case of any deviation from the requested delivery date or quantity the supplier is requested to inform proactively and expedite if required. ThyssenKrupp Elevator reserves the right to charge back all extra costs and expenses caused by late deliveries (e.g. production re-scheduling, overtime, customer penalties).

10.3 Order and release process



Goods and components will be ordered per individual ThyssenKrupp Elevator site. The orders or order releases will be submitted in written form or electronically (EDI – Electronic data interface). Beside other information, orders or order releases will contain a part identification, a quantity, a delivery date, destination and terms. The suppliers of ThyssenKrupp Elevator are requested to meet order requirements. In case of any questions concerning an order, the supplier should proactively contact ThyssenKrupp Elevator and seek for clarification.

10.4 Packaging, Labeling



For all deliveries appropriate packaging needs to be aligned with ThyssenKrupp Elevator and documented in packaging specifications. In the process of defining the packaging following criteria should be considered:

- protection of goods against damage, contamination, corrosion, shock, humidity or other environmental influences which could have a negative impact on the quality of the goods
- compliancy with statutory regulations in respect of environment protection (banned materials, certification for wooden materials) and health & safety
- general ecological and efficiency aspects, such as reusable, returnable or recyclable packaging, space saving
- protection against electrostatic loading of the goods
- handling issues such as ability to store and to stack
- appropriate labeling for identification and tracking

Trial runs to prove feasibility of packaging may be required.

10.5 Logistic carriers



For all deliveries being paid by the supplier, the supplier is free in his choice of carriers but shall comply with requirements according to the specification and applicable standards. General aspects as costs, safety & environmental aspects and performance should be key criteria for selection. For all deliveries being paid by ThyssenKrupp Elevator the supplier is required to clarify all details with the ordering company and utilize ThyssenKrupp Elevator's preferred carriers.

10.6 Advanced shipment notice



ThyssenKrupp Elevator may request an “Advanced shipment notice” (ASN) which announce a shipment being in transfer to the respective ThyssenKrupp Elevator site.

10.7 Traceability, First in first out (FIFO)



Records are to be kept for the constant traceability for all products from the raw materials or input stock up to dispatch of the finished parts and components. Provision is also to be made for appropriate measures to ensure traceability at the supplier plants. All material must be managed following the First-In-First-Out rule to ensure proper management of changes and traceability. There may be specific requirements concerning the level of traceability set forth by individual sites.

10.8 Transfer of perils



“IncoTerms” will clearly define the transfer of perils and will be stated in the purchase order. In case of any doubts the supplier is asked to seek for clarification with ThyssenKrupp Elevator.

10.9 Flexibility to adjust to quantity changes



The supplier’s supply chain logistics and manufacturing process should allow for quick adjustments of quantity changes in a reasonable range being requested by ThyssenKrupp Elevator as a customer. However, any changes of the ordered quantity will be communicated by ThyssenKrupp Elevator in written form (e.g. additional or updated purchase order).

10.10 Consignment warehousing



ThyssenKrupp Elevator may request its suppliers’ to deliver into a consignment warehouse and enter into a bilateral agreement. In this case the supplier will deliver goods into a warehouse managed by ThyssenKrupp Elevator or a third party based on minimum and maximum stock level requirements. The goods are owned by the supplier as long as they remain in the warehouse. Upon withdrawal or collection of the goods by the respective ThyssenKrupp Elevator company the ownership is transferred to the relevant ThyssenKrupp Elevator company. The withdrawal or collection of the goods will trigger payment of goods.

10.11 Safety stock



The supplier is generally requested by ThyssenKrupp Elevator to maintain a sufficient but balanced finished goods stock level. Influencing criteria are raw material availability, replacement time, back up production, capacity etc. Specific ThyssenKrupp Elevator requirements will be agreed upon in written form (individual contract).

10.12 Spare parts



Especially in the area of service and modernization ThyssenKrupp Elevator’s field organization may approach the suppliers with specific requirements concerning spare parts availability and a feasible logistic set up. The requirements will be agreed upon case by case.

11 Tooling (subsidized tools only)

11.1 Tool management (incl. devices and test equipment) ■■

In case that a ThyssenKrupp Elevator company pays for tools, the relevant ThyssenKrupp Elevator group company shall own the respective tools which, however, after physical handover to the supplier may remain in the possession of the supplier for production purposes. The ownership of the tools is transferred upon payment of the tools by the ThyssenKrupp Elevator Company and either creation of the tools or appropriation of the tools by supplier, whichever is earlier. The ThyssenKrupp Elevator company owning the tools may demand the handover of the tools at its sole discretion. The supplier is required to manage all ThyssenKrupp Elevator subsidized and thus owned tools appropriately and diligently. This includes maintenance, storage, change management on modification, labeling and an adequate insurance covering general risks. Prior to scrapping tools and production devices, even if damaged or defective, the supplier has to obtain the scrapping approval from ThyssenKrupp Elevator. ThyssenKrupp Elevator reserves the right to audit the overall tool management process at any given time with prior notice.

11.2 Maintenance and storage ■■

The tools are to be properly stored and protected against any kind of damage. The supplier shall ensure that the tools are constantly free of defects and ready for operation by carrying out continual servicing and maintenance at its own expense. The supplier shall furnish evidence of this on demand.

11.3 Modifications to tools ■■

Modifications to tools are only allowed with the prior written consent of ThyssenKrupp Elevator. In the event that modifications to tools are required as a result of changes in the technical specifications issued by ThyssenKrupp Elevator, then the first step will be to submit a written modification offer.

11.4 Duty to return tools/storage period ■■

On request of ThyssenKrupp Elevator, the supplier is obliged to return anytime the tools which belong to ThyssenKrupp Elevator in a condition that allows faultless series production.

11.5 Restriction on use/identification ■■

Subsidized tools (also amortization by part price) are to be used exclusively for the purpose of fulfilling the supplier's delivery obligations to the respective ThyssenKrupp Elevator company. The tools are to be labeled accordingly, such as (e.g.): "Property of ThyssenKrupp Aufzugswerke". ThyssenKrupp Elevator reserves the right, if necessary, to require e.g. the following documentation: tool construction, maximum output or production volume, cavities, production capacity per hour, length x with x height dimensions, weight and photo.

11.6 Liability and insurance of (customer owned) tools



The supplier is liable for all defects, damages, modifications or deterioration of tools. The supplier's liability is not applicable if the defects, damages, modifications or deterioration of tools are due to force majeure. The supplier has to ensure that the tools are safe and cannot cause personnel or property damages. The supplier shall indemnify ThyssenKrupp Elevator from such damage claims. The supplier is responsible to ensure that subsidized tools are sufficiently insured against fire, explosion, theft, storm, water damage, etc.

12 Claim Management and escalation

12.1 Non conforming goods or components



ThyssenKrupp Elevator will inform its supplier about deviations and claims. Non-conformities can be identified at incoming inspection, production or in the field. The processing will be carried out by means of inspection report, preliminary information can be given per Mail, e-mail, Fax or Phone. The quality claim will only be closed when the root cause of the claim has doubtlessly been identified and resolved.

12.2 Handling of non conforming goods or components / rework



Non conforming/rejected material should be contained in separate, designated and locked areas and labeled accordingly. Affected quantities need to be declared as such in the respective materials management system. Should the supplier plan to re-introduce reworked goods or components, state of the art quality management processes should support this, to avoid any subsequent issues.

12.3 Problem solving methods and tools



In case of non-conformancies, the supplier is required to utilize appropriate and state of the art problem solving methods, such as 8-D report, Fish-Bone diagram, 5 Why etc. If needed, the supplier should seek for external support e.g. laboratories, institutes.

12.4 Containment measures



Initiations of containment measures are the first steps in a root cause analysis process. Containment actions specifically control the damage, they do not necessarily have a corrective effect. In a figurative sense this means basically:

- 1) control/seal the issue
- 2) assess the damage
- 3) track and trace how much may have spread
- 4) notify all relevant parties (e.g. customer)
- 5) further actions if necessary (e.g. in case of safety risks)

All these steps are to be documented accordingly.

12.5 Charge back process



In the context of a quality claim, ThyssenKrupp Elevator will try to keep additional costs at a minimum in the effort to not discontinue its supply chain (including production) and satisfy ThyssenKrupp Elevator's customer requirements. However ThyssenKrupp Elevator reserves the right to charge back any subsequent costs incurred with a quality claim caused by its supplier. There will be supporting documentation (e.g. freight invoices, evidence of labor costs, rework costs, customer penalties) sent along with a debit note. A best estimate of potential costs incurring with a claim will be announced to the supplier in written form with the option for the supplier to propose feasible alternative options.

12.6 Escalation routine



Should a quality claim not be resolved adequately in a timely manner or in case of repeating issues ThyssenKrupp Elevator will apply an escalation routine in order to avoid further damages and with it occurrence of additional cost. Depending on the effectiveness of agreed measures (e.g. improvement of delivery or service performance), the reaction time of the supplier, quality of information and supply level at ThyssenKrupp Elevator, the individual escalation steps apply. ThyssenKrupp Elevator will inform the supplier in written form about an escalation measure becoming effective.

13 Severability



Any part or provision of this Global Supplier Manual which is held for any reason to be illegal, invalid, unenforceable or in conflict with the applicable laws or regulation of any jurisdiction shall be ineffective only to the extent of such illegality, invalidity, enforceability or conflict. The Parties agree to replace the invalid, ineffective or unenforceable provision by a valid, effective and enforceable provision which economically best meets the intention of the Parties. The same shall apply in the case of an omission.

14 Appendix

14.1 Cited and applicable standards

The list of cited and applicable standards is for reference only and does not represent a complete overview. It is the suppliers' responsibility to apply the most relevant releases:

Reference	Subject
EN 81-1, EN 81-2	Passenger lifts
EN 81-1, EN 81-2	Goods passenger lifts
EN 81-21	Lifts in existing buildings
EN 81-22	Inclined lifts
EN 81-3	Service lifts
EN 81-31	Goods only lifts
EN 81-40	Stairlifts
EN 81-70	Lifts for disabled passengers
EN 115	Escalator
ASME A17.1	Safety Code for Elevators and Escalators
ISO 9001:2008	Quality management systems — Requirements
ISO 14001	Environmental management standards
OSHA	Occupational Safety and Health Administration
REACH(EG) Nr. 1907/2006	Registration, Evaluation, Authorization and Restriction of Chemicals
GRI	Global Reporting Initiative
DIN EN ISO 27001/02	Environmental management standards Information Security

14.2 Glossary / Abbreviations

8D process	A systematic course of action for solving problems and for introducing suitable corrective measures which ensure that errors do not re-occur
6-S Method	"6S is a method for organizing a workplace and housekeeping methodology. The 6 S represent Sorting, Straighten, Sweeping or Shining, Standardizing, Sustaining, Safety"
6-Sigma	Six Sigma is a methodology to improve quality of process outputs by identifying and removing the causes of defects (errors) and variation in manufacturing and business processes. It uses a set of quality management methods, including statistical methods. 6-Sigma itself mathematically describes 99.9997% efficiency or in other words 3ppm
APQP	Advanced Product Quality Planning is to produce a product quality plan which will support development of a product or service that will satisfy the customer.
ASN	Advanced Shipment Notice
CAD	Computer Aided Design (CAD)
CAE	Computer Aided Engineering (CAE)
CAQ	Computer-aided quality assurance (CAQ)

Cmk	Short-term process control (machine control)
CoC	Code of conduct
Cpk	Continuous process control
FEM	Finite element method (FEM) is a numerical method to solve complex calculations in engineering. FEM is most frequently used to prove technical feasibility of new design up front
First parts yield	First parts yield describes the ratio of parts entering a production process and parts leaving the process as good parts
FMEA	Failure Mode and Effect Analysis, Analysis of potential failure effects and their consequences
MSA	Measuring system analysis
PPAP	Production Part Approval Process (initial sampling process)
Ppm	parts per million 5,000 ppm = 0.5%, in the context of production ppm is am measurement for failure rates
Run@rate	Run@rate is a trial run of a production process under serial production conditions to determine if a newly established process has the right capacity and capability

14.3 Links



<http://thyssenkrupp.com>
<http://www.thyssenkrupp-elevator.com>
www.unglobalcompact.org

14.4 Keyword search



This document has been provided as a pdf document. This allows for easy navigation and keyword searches utilizing the search function.

14.5 Editorial



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ThyssenKrupp Elevator – Global Supplier Manual
Release January 2013 V2013-02

We appreciate your feedback:

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Comments / Notes



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