Quality Management System Manual

This manual applies to SCHOTTEL Industries GmbH and its subsidiaries and contains a description of the quality management system in accordance with the most recent applicable version of DIN EN ISO 9001.

Masthead

SCHOTTEL Industries GmbH
Central Quality Assurance
Germany

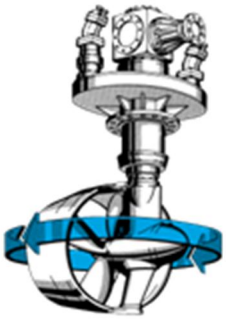
Mainzer Strasse 99
56322 Spay

www.schottel.de
www.schottel-industries.de

Foreword

Josef Becker (1897 – 1973)

Josef Becker (1897 – 1973), founder of the company, is honoured posthumously with the Elmer A. Sperry Award 2004



The SCHOTTEL Rudderpropeller

Firmensitz 1950

SCHOTTEL Industries GmbH is a parent company with the subsidiaries SCHOTTEL GmbH, Wolfgang Preinfalk GmbH (PW), HW Elektrotechnik GmbH and SCHOTTEL HYDRO GmbH. The origins of the SCHOTTEL Group lie in the present-day SCHOTTEL GmbH, one of the world's leading globally operating manufacturers of thrusters for vessels, offshore applications, complete propulsion systems with power ratings up to 30 MW as well as steering systems for vessels of all sizes and types. The quality of the products and services is paramount for all companies belonging to SCHOTTEL Industries GmbH.

The present-day SCHOTTEL GmbH has been an independent family-owned enterprise for over 95 years.
In that time, it has developed an outstanding market position as a result of its customer focus, research, innovation and the reliability of its products.

SCHOTTEL has always stood out for its vertical range of manufacture.
That safeguards expertise and availability, while simplifying business processes, saving time and guaranteeing a consistently high level of quality.
Applying an effective quality management system is particularly important in maintaining the SCHOTTEL Group's excellent market position over the coming years.

This concise and clearly structured manual is aimed not only at

- SCHOTTEL personnel, but also at
- customers,
- suppliers and
- interested parties

with the objective of presenting how company policies are implemented with regard to the quality management system

Contents

1. Scope:

The QM system at SCHOTTEL Industries GmbH applies

- **to all activities involved in the creation of products and services,**
- **from establishing the customer's requirements and those of interested parties and**
- **identifying internal and external issues,**
- **through all the processes in the QM system,**
- **to ensuring that our customers and interested parties are satisfied.**

The customers and interested parties who are relevant to this QM system have been

- **identified and**
- **the requirements involved are monitored and reviewed.**

Changes to the scope will result in an update.

The QM manual applies to the German sites of SCHOTTEL Industries GmbH (=SCHOTTEL Group as defined in our QM system).

No requirements of the DIN EN ISO 9001 standard are excluded within the SCHOTTEL Group.

1.1 Approval and release

This manual describes the principles with regard to the quality management system that are applied at SCHOTTEL Industries GmbH.

It is based on the quality standard DIN EN ISO 9001 and is a binding specification for our group of companies.
Wherever necessary, further requirements are taken into consideration within the individual business units.

All of our products and services comply with the applicable norms (DIN, EN, ISO) and standards (specific to the respective countries, products and applications) in order to meet statutory and regulatory requirements.

Furthermore, the relevant provisions of the ship classification societies must be mandatorily applied to our products and services - provided this is required.

SCHOTTEL Industries GmbH operates a system with an exchange and update service for the purpose of archiving these norms and standards and keeping them up to date.

This ensures that SCHOTTEL Industries GmbH always provides state-of-the-art products and services.

Tasks, authorities and responsibilities are defined in the manual and the other relevant documents.

Procedures and processes ensure that our products and services are manufactured and supplied in line with requirements.

All documents that contain operations, procedures and processes relating to the QM system are valid documents whose application is mandatory for our employees.

The company management of SCHOTTEL Industries GmbH approves this manual in compliance with the requirements of company and quality policies and puts it into effect.

The Board of Management of SCHOTTEL Industries GmbH

Spay, 20. September 2016

2. SCHOTTEL Industries GmbH, products and services

SCHOTTEL GmbH

SCHOTTEL GmbH incorporates
• the business and product divisions,
• SCHOTTEL's field offices in Germany and
• SCHOTTEL's foreign subsidiaries.
In addition, SCHOTTEL GmbH has numerous sales and service partners in Germany and abroad.

Azimuth thrusters for vessels of all sizes and types

SCHOTTEL thrusters have 360° steerability. The propulsion power can thus also be used for manoeuvring.

This allows maximum manoeuvrability, optimum efficiency, space-saving installation, safe and economical operation and simple maintenance.

They are powered by diesel engines, electric or hydraulic motors or a hybrid combination.

Typical propulsion systems are the Rudderpropeller and Twin Propeller.

These thrusters are used, for example, for tugs, offshore supply vessels, river cruise ships, container ships, yachts, floating cranes, production platforms, platform supply vessels etc.

Controllable-pitch propeller systems for vessels of all types and sizes

They are employed wherever variable operating conditions are prime requirements and there is a demand for a high degree of manoeuvrability at varying speeds.
The propellers have diameters between 1.5 and 8 m in propulsion systems with power ratings up to
30 MW.
Unlike conventional fixed-pitch propellers, the blades can be turned about their own axis in order to adjust the pitch of the propeller.

The propulsion systems are used, for example, on large ferries, container ships, sophisticated offshore facilities with dynamic positioning, yachts, conventional freighters, fast ferries or powerful tugs.

Manoeuvring aids for vessels of all types and sizes

Transverse thrusters and Pump Jets are examples of typical manoeuvring aids.

Pump Jets, for example, are manoeuvring and propulsion systems suitable for operating even in extreme conditions.

Their compact and robust design, not to mention their space-saving installation in the vessel's hull, mean there is virtually no risk of damage in the event of grounding. The Pump Jets allow for smooth, quiet operation, thus ensuring a very high level of comfort.

Pump Jets are employed as main or auxiliary propulsion systems for extreme operating conditions, such as on shallow-draught vessels operating in shallow waters, yachts with high comfort requirements, military applications etc.

2. SCHOTTEL Industries GmbH, products and services
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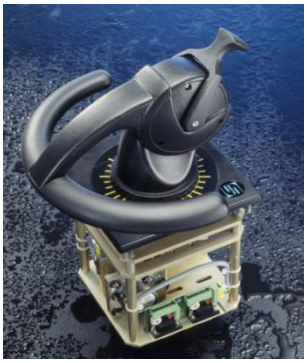
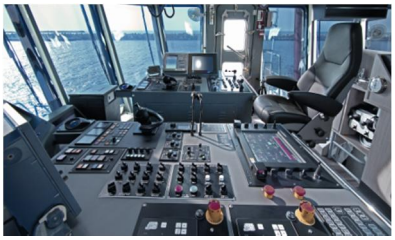




Manufacture of steering and control systems (SST) for steering desks on vessels

These are tailor-made for each specific application.

The spectrum ranges from simple, manually-operated wheels coupled directly to the thruster itself, to steering consoles, right through to computer-assisted, remote-controlled joystick systems for controlling up to 10 thrusters. The use of freely programmable microcontroller cards with an integrated field bus and other industry-standard interfaces affords a high degree of flexibility and operational reliability.

The steering and control systems are used, for example, to provide ship's masters with an optimum tool to operate, manoeuvre and position their vessels easily and safely.

Modernization and retrofitting of ship propulsion, steering and monitoring systems

In many cases, it is more economical to modernize the propulsion system, instead of repairing it or replacing it with a new one.

On account of changed requirements and technological advances – such as increased power, cost-effectiveness, safety, new maintenance concepts and preventive monitoring – propulsion, manoeuvring and steering systems that have been in service for many years are modernized in terms of technology and control to enhance their power and operating comfort while simplifying maintenance procedures.

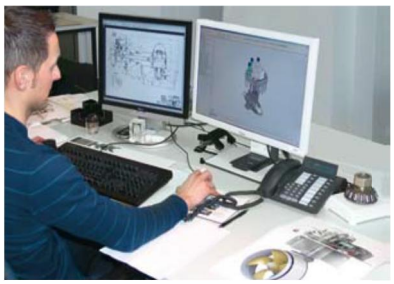
These modernization solutions are tailored to the respective customer requirements.

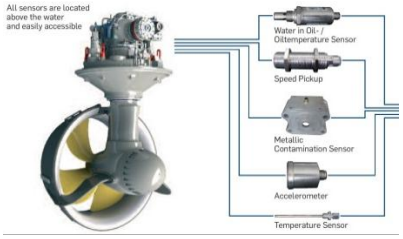
Organization of training courses at the SCHOTTEL Academy

Training customer, sales and service personnel in how to handle, maintain and service the propulsion and manoeuvring systems to ensure reliable operation.

Using a training simulator incorporating the relevant international waterways and ports, customer personnel such as masters and crew, external service engineers and fitters are given tailored instruction on how to work safely with various thrusters, manoeuvring systems, control levers, steering consoles and displays. Training also covers the operating principles of the steering desk, electric switchgear, hydraulic station and Rudderpropeller.

2. SCHOTTEL Industries GmbH, products and services
(continued)





Repair of large and small propulsion systems

As part of our service offering, large and small propulsion systems are repaired to the highest standards, quickly and reliably, within a closely coordinated global network of repair sites and centres.

Systems technology and visualization

Systems technology and visualization support the user-friendly application of our systems.

One example is the Condition Monitoring System for measuring various machine parameters as an element of preventive/condition-based maintenance.

This reduces the servicing costs for the propulsion and manoeuvring systems of vessels.

Research

At SCHOTTEL's Josef Becker Research Centre, engineers from various specialist fields work together on an interdisciplinary basis.

Irrespective of their day-to-day work, they carry out research aimed at meeting future requirements in the maritime sector.
This also involves cooperation with international research institutes.

The internationally acclaimed Elmer Sperry Award received in 2005 in the USA for the invention of the Rudderpropeller as a major contribution to improving transportation worldwide is recognition of our pioneering achievements in the marine propulsion sector, our research excellence and the resultant innovations.

2. SCHOTTEL Industries GmbH, products and services
(continued)

Applications of propulsion and manoeuvring systems

Propulsion and manoeuvring systems are used in many maritime applications and other sectors, such as:

Shipbuilding and marine technology

Offshore industry

Tankers

Container ships

Chemical tankers

Icebreakers

River cruise ships

Yachts

Sea-going tugs

Harbour tugs

Ferries

Platform supply vessels

Rudderpropeller systems for use on drilling rigs

Floating cranes/heavy-lift transporters

Turbines for tidal and river current power generation

Gearing parts and transmissions for wind power plants, hydroelectric power plants and mining installations

Automation and control technology for shipbuilding, the automotive industry, conveyor and crane technology

etc.

The qualified staff, engineers, technicians and specialists at the SCHOTTEL Group develop and produce customized solutions resulting in products and services whose core aspects are

- **functionality and**
- **quality,**
- **while also giving due consideration to occupational and environmental safety**

Our products and services are presented and described not only in overview brochures, detailed descriptions, technical data sheets and operating instructions, available in various languages, but also on our website with overviews and search functions.

2. SCHOTTEL Industries GmbH, products and services (continued)

Wolfgang Preinfalk GmbH, St. Ingbert

Gears and components

We are solutions specialists in the field of gearing and components. Almost every work step along the value chain is carried out at our site in St. Ingbert.

Your advantage:
- State-of-the-art machinery
- Temper etch testing

Our expertise:
- High quality standards
- Procurement of high-quality and certified material

Certification:
- Numerous certifications
- Cooperation with all major ship classification societies

Transmissions and drive technology

Our transmissions and drive units are characterized by an optimum degree of efficiency and a high level of operational reliability.

We support you from initial conception through to the final product and make our full commitment and expertise available to you over the course of our collaboration:

- Development and design
- Consultancy and engineering
- Manufacture, assembly and bench testing
- Installation, instruction and training
- Service & after-sales support

We manufacture transmissions for numerous applications and industries.

Case hardening

We have many years of experience and the state-of-the-art equipment for hardening your gears.

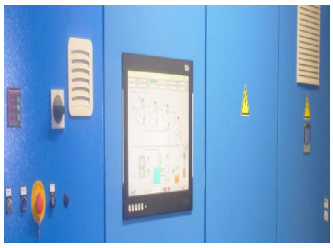
Various heat treatment processes can be carried out in our all-purpose systems:

- Case hardening using the nitrogen-methanol-propane process
- Stress relief annealing
- Quenching and tempering

We carry out metallographic examinations, hardness testing and hardness profile testing in our materials laboratory.

2. SCHOTTEL Industries GmbH, products and services (continued)

HW-Elektrotechnik GmbH, Laudert



Automation

Our range of products and services covers:

§ Development and project planning of complete automation systems
§ Hardware engineering
§ Software engineering
§ Switchgear production
§ Assembly
§ Commissioning
§ Service

Examples of solutions and industries:

§ The automotive and automotive supplier industry
§ Machine linking
§ Production systems for semi-finished plastic products
§ Process technology
§ Mixing and dispensing systems for paints and granulates
§ Assembly lines
§ Placement machines, removal systems
§ Inspection stations
§ Amusement rides for leisure parks
§ Packaging technology
§ Facility automation and control technology

Development and project planning of complete automation systems

Our highly motivated team of engineers, technicians, master craftsmen and specialists collaborates with you to develop a concept for your automation system according to your specifications and needs.

Thanks to our extensive experience and technical expertise, we can produce forward-thinking, innovative solutions for your system concept.

We set the same quality standards for small control systems as we do for comprehensive, process-controlled, networked and visualized systems.

Hardware and software engineering

We use advanced CAE/CAD systems to design your system.

Switchgear production documentation is always created in compliance with the latest standards in the automation technology sector.

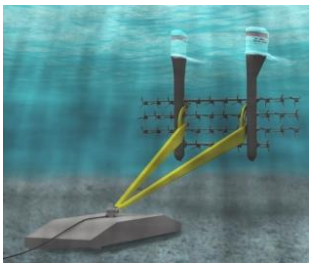
Various PLC and PC controllers are used for programming purposes.

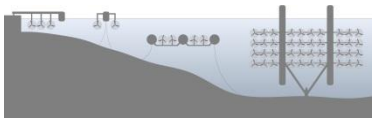
Examples from our range of products and services:

§ Siemens SIMATIC®
§ CODESYS®
§ Allen Bradley Logix®
§ MS Visual Studio®
§ Applications for KUKA and ABB robots and vision systems
§ User interface (HMI) creation, PC-based or embedded

2. SCHOTTEL Industries GmbH, products and services
(continued)

SCHOTTEL HYDRO GmbH, Spay





SCHOTTEL HYDRO specializes in the harvesting of hydrokinetic energy and the development of customer- and application-specific solutions in this field. SCHOTTEL HYDRO focuses on three business areas: hydrokinetic turbines, semi-submerged platforms and components (e.g. turbine hubs and gearboxes). The British company TidalStream Ltd. (TSL) and the Canadian company Black Rock Tidal Power (BRTP) are also part of SCHOTTEL HYDRO. The headquarters of SCHOTTEL HYDRO are in Spay, Germany and there are SCHOTTEL sales and service sites across the globe.

SIT - SCHOTTEL Instream Turbine

SCHOTTEL hydrokinetic turbines are light, yet robust. With a diameter of three to five metres, they generate between 54 and 70 kilowatts, depending on the flow velocity, which is fed straight into the electricity grid. By having several turbines in one installation, a higher demand for energy can be met. Each turbine is connected to a frequency inverter that feeds the energy into a direct current bus on a carrier platform.

The turbines generate electric power from tides and other flows in rivers, sea straits and offshore. They are mounted on jetties, floating and submerged platforms and are also suitable for use in shallow waters.

Platform systems

SCHOTTEL HYDRO supplies the semi-submerged platform TRITON in collaboration with its subsidiary TidalStream Ltd. TRITON can be used as a carrier platform for turbines of different sizes and designs. TRITON platforms make it possible to use hydrokinetic energy effectively in water depths of up to 90 metres, with one installation being capable of generating up to 10 megawatts. The platform aligns itself automatically with the water flow.

It can float to the surface at any time if the electrical equipment and control systems need to be serviced. By emptying and filling the ballast tanks in the lower section of the hulls, the platform can switch easily between its operating and maintenance positions.

Components

Drawing on SCHOTTEL's 60-plus years of experience in the construction of maritime plants, SCHOTTEL HYDRO also supplies components for hydrokinetic power generation: Gearboxes, shafts, seal systems, hubs and blade adjustment mechanisms for turbines.
For example, SCHOTTEL components are used in the three-blade Andritz Hydro Hammerfest HS 1000 turbine. This has a power rating of one megawatt and is suitable for installation on the seabed at water depths of between 40 and 100 metres. The blade adjustment mechanism allows the different tidal flow directions to be optimally exploited.

3. Company and quality policies

The quality policy at SCHOTTEL Industries GmbH has been established for all sites in Germany by way of a QM system (DIN EN ISO 9001) and helps to safeguard their existence.
It is derived from the SCHOTTEL corporate strategy and provides guidelines for creating, maintaining and improving the quality management system at SCHOTTEL Industries GmbH as well as the associated holistic quality objectives. It applies to all activities within the company's field of operation.

As the company management, we have a duty and responsibility to implement, review, maintain and ensure the effectiveness of the QM system at SCHOTTEL Industries GmbH.

Our **quality policy has 7 key principles,** which are outlined and explained below.

Customer focus

In order to achieve and maintain the satisfaction and trust of our customers across the globe (purchasers, operators, authorities, research institutes and other stakeholders[1]), the quality of our products and services is our top priority.
We maintain strong relationships with those groups who have an impact on the quality of our products and services.

This involves determining and fulfilling customer requirements and engaging in constant communication as these approaches facilitate continuous improvement and, in turn, help us to deliver products and services that give our customers a competitive advantage.

Customer focus is paramount in all processes at SCHOTTEL Industries GmbH.

Currently applicable and future statutory and regulatory requirements are identified and met.

[1]) e.g.: Owners, the general public, employees, employee representatives, suppliers, service providers, certification authorities.

Leadership

At all levels of the company, we establish the conditions enabling our employees to know, understand and apply the quality policy and objectives so that they can actively and continually contribute to the quality of our processes, products and services and also help to improve it.

As such, the requirements of the quality policy are a form of work instructions for our employees. Supervisors at all levels ensure that they are implemented.
The requisite responsibilities and authorities have been determined and assigned. As part of their remit, the supervisors are obliged to make the necessary resources available.

3. Company and quality policies (continued)

We support our managers in recognizing their leadership role within their respective areas of responsibility.

The focus is on the continual provision of products and services that meet and uphold the requirements of our customers and the relevant statutory and regulatory authorities.

We ensure that we meet our objectives by regularly evaluating whether the QM system is appropriate, adequate and effective on a permanent basis.
The leadership of our company must be exercised in a way that is characterized by social responsibility and fosters respect for the company due to its integrity and its positive contribution to society.

No one at SCHOTTEL Industries GmbH should be disadvantaged as a result of their gender, race, nationality or ideology.

Engagement of people

Our employees are our greatest asset – their engagement is part of our corporate culture.

Our selection, education and training programmes and our leadership culture guarantee that employees at all levels of the company perform their quality assurance tasks as part of the QM system, as they are authorized to do so within their respective areas of work and responsibility, in a competent and committed manner in order to provide products and services that conform to the quality policy and objectives, while also continually improving their own work by adopting a positive fundamental attitude towards quality.

In this way, each and every employee contributes to safeguarding the existence of SCHOTTEL Industries GmbH, to developing the company in line with our corporate objectives and to protecting jobs.
It is their duty to perform these tasks according to the specified guidelines and instructions.

Our actions are dictated by mutual respect, trust and recognition.

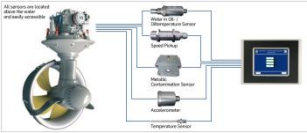
Process approach

Process-oriented behaviour is paramount when implementing the requisite established corporate processes.

Our added-value approach ensures that the requirements of the QM system are integrated into the company's business processes, thus ensuring they are always adhered to.

Having an understanding of the interactions and resources involved leads to an improvement in the performance of our QM system, the products and the services.
The risks and opportunities that could have an influence on the conformity of products and services, as well as the ability to

3. Company and quality policies (continued)

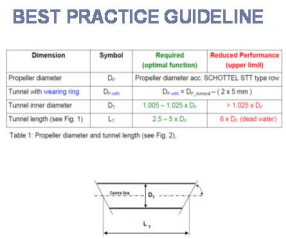


improve customer satisfaction are identified and taken into account.

The focal point of all activities is the awareness to implement preventive measures so that, wherever possible, we perform our work correctly at the first attempt.

We ensure the quality of our products / services by planning all the necessary measures before and during the order fulfilment process and by systematically monitoring all the processes involved in product / service creation.

Improvement



BEST PRACTICE GUIDELINE

Dimension	Symbol	Required (optimal function)	Reduced Performance (upper limit)
Propeller diameter	D_P	Propeller diameter acc. SCHOTTEL STT type row	
Tunnel with wearing ring	$D_{T\,with}$	$D_{T\,with} = D_{T\,normal} - (2 \times 5\ mm)$	
Tunnel inner diameter	D_T	$1.005 - 1.025 \times D_P$	$> 1.025 \times D_P$
Tunnel length (see Fig. 1)	L_T	$2.5 - 5 \times D_P$	$6 \times D_P$ (dead water)

Table 1: Propeller diameter and tunnel length (see Fig. 2).

In order to have continued success, we are committed to constantly improving and maintaining our QM system, with its internal and external processes, and thus customer satisfaction.

We aim to be outstanding at everything we do. That applies to our products, their safety and value for money as well as our services, social relations, our competitive position and earning capacity.

If necessary, we adapt our company and quality policies to changes in circumstances.

Evidence-based decision making

Prüfprotokoll Ruderpropeller

The effectiveness of the QM system and its improvement is evaluated using key indicators on a regular and systematic basis. Decisions that impact on the QM system are made on the basis of data and facts.

They help us to recognize the relationship between cause and effect and any potential unintended consequences. As a result, they encourage us to improve the process capability of the company and, in turn, enhance customer satisfaction with regard to our products and services.

Relationship management

The company maintains mutually beneficial relationships with customers, suppliers and other socially relevant stakeholders who have an impact on the effectiveness of the QM system. Their requirements are identified, monitored and reviewed.

We are intent on balancing the different interests. This supports us in our ability to provide faultless processes, products and services.

Wherever appropriate, the quality policy is made available to the relevant interested parties.

4. Structure of the quality system and control processes

4.1 The corporate structure of SCHOTTEL Industries GmbH with its subsidiary companies

The current structure is shown below:

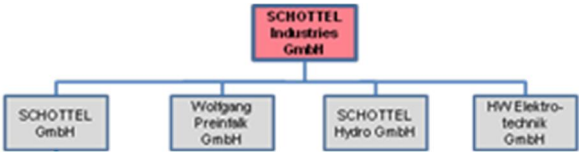


Figure 1

4.1.1 Worldwide sales

This includes:
- **Domestic and foreign subsidiaries,**
- **Sales and service partners.**

4.1.2 Business and product divisions

They are organized in terms of functions, with the following basic structure:

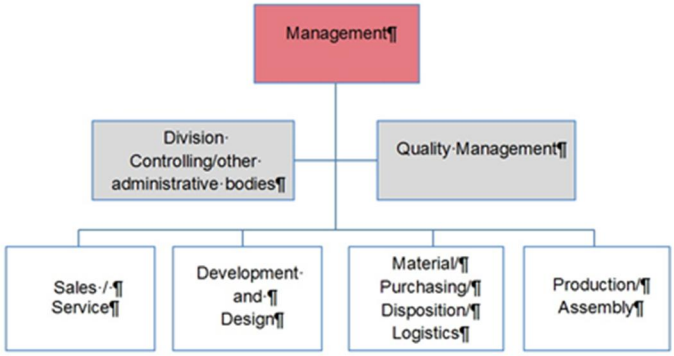


Figure 2

4.1.3 Central departments:

They perform group-wide functions and develop generally applicable standards for the following fields of responsibility:

Sales/Marketing

Service

Research/Development

Design/Engineering/Standards/ Documentation

Controlling

Quality Management

Supply Chain

IT

Data Protection

Human Resource Management/Development

Training/Instruction

Occupational Safety/Environmental Protection

Process Planning/Operations Scheduling

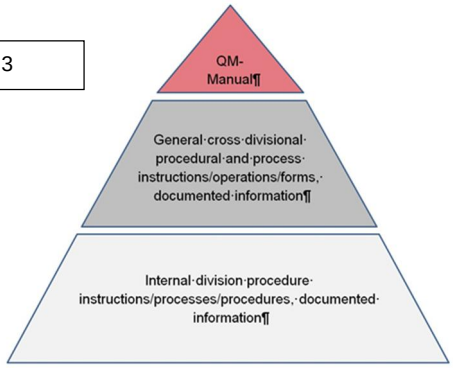
Facility Management

4. Structure of the quality system and control processes (continued)

4.2 Documentation structure

4.2.1 Classification of documents

Figure 3



Our process-oriented documentation consists of 3 levels and is the basis for implementing the company and quality policies, informing all employees about the organizational structure and system/process operations as well as continuous improvement.

Level	Document	Content
1. External	QM manual	Presentation of the group of companies and the basic procedures (see also 4.2.2, SCHOTTEL process model) · System and process structure/control processes · Leadership processes · Management of resources · Company processes for the provision of products and services (core and auxiliary processes) · Measurement, analysis, improvement and evaluation processes.
2. Internal	General cross-divisional procedural and process instruc-tions/operations/forms as documented information	Describe the interfaces and the cross-divisional principles between a central division and the business/product divisions.
3. Internal	Internal division PIs/processes/ procedures as documented information	Describe general procedures/processes that the individual divisions follow. Every procedure/process is assigned to an organizational or process step.
	Work/inspection instructions, forms as documented information	These are additional work/process documents that are assigned to an aforementioned guideline or instruction or relate to a product, material or service.

4. Structure of the quality system and control processes (continued)

4.2.2 User manual and process-oriented structure

All the documentation levels in the classification table (4.2.1) form the basis for the user-related and division-related manuals.
They have the following structure:

User manual
Part 1: The QM system at SCHOTTEL Industries GmbH

1.1 Quality management manual
1.2. Procedural/process instructions

Part 2: Division-related organization documents

2.1 Division presentation – Production, product and service portfolio
2.2. Division organizational chart/levels of responsibility
2.3. Division-related company and quality objectives

Part 3 Division-related regulations

3.1 Division QM system
3.2 Division procedural/process instructions
3.3 Division work/inspection instructions, forms as documented information
3.4 If necessary, this part can be extended in relation to the division

Classification table

Level 1
Level 2

↑

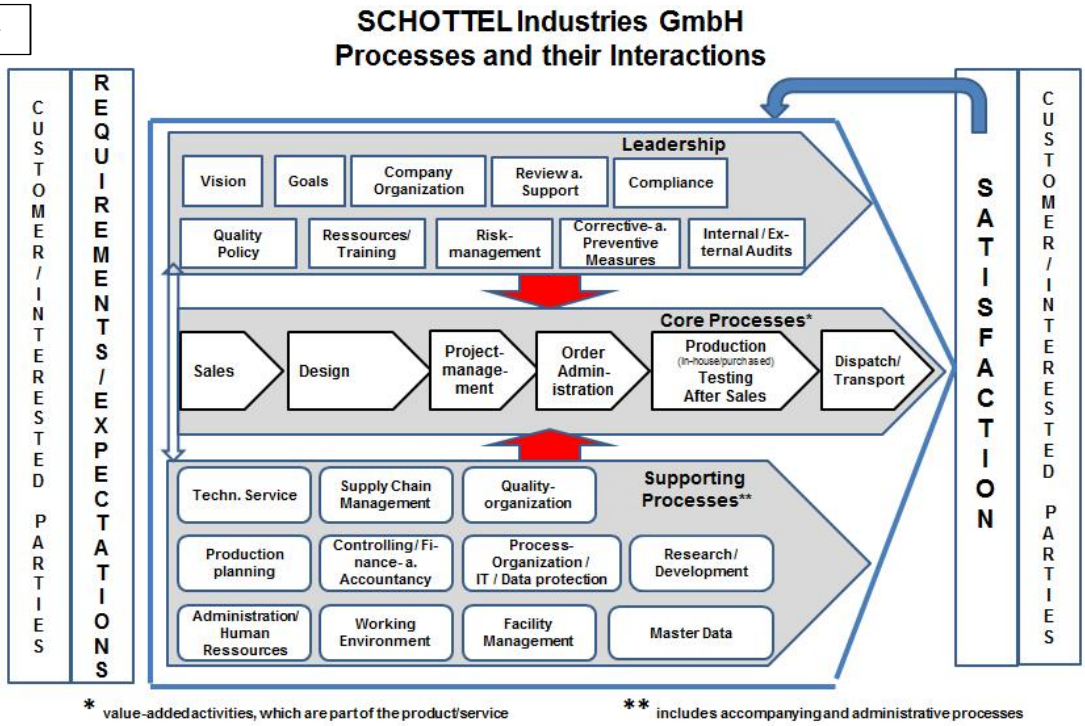
Connection level
Organization incorporating the central specifications

↓

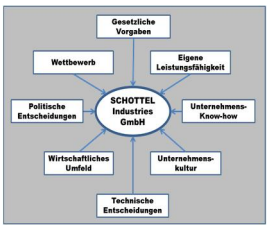
Level 3

The quality management system at SCHOTTEL Industries GmbH is of process-oriented structure:

Figure 4



5. Requirements related to the quality system



4 Context of the organization

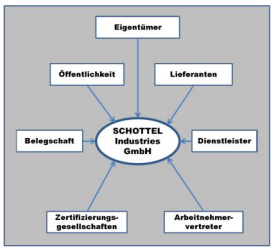
4.1 Our understanding of the companies and their economic framework

The framework conditions that are relevant to the objectives and strategic orientation of our company and have an impact on the intended results of our QM system have been defined and exist as documented information.

They are evaluated in management reviews with regard to current relevance and are updated if necessary.

The framework conditions are made up of external and internal factors:

a) **External** determining factors relate to, for example, issues arising from legal, technological, competitive, market, cultural, social and economic environments, whether international, national, regional or local, and
b) **Internal determining factors** relate to, for example, values, culture, knowledge and performance of our company.



4.2 Understanding the needs and expectations of interested parties

These organizations or people have an impact on our company. They are identified in Chapter 3 of this QM manual as part of the company and quality policies.

The
a) interested parties relevant to our QM system with
b) the requirements relevant to us
have been determined as documented information.

4.3 Defining the scope of the QM system

The limits and applicability of the QM system are detailed in Chapter 1 of the QM manual.

This addresses:

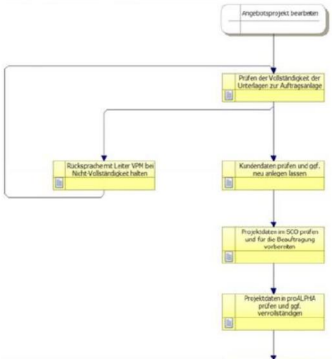
a) the external and internal issues stated in Section 4.1 in Chapter 5 of the QM manual,
b) the requirements of the relevant interested parties stated in Section 4.2 in Chapter 5 of the QM manual and
c) the SCHOTTEL products and services detailed in Chapter 2 of the QM manual.

The QM requirements specified for the scope are applied.

The related documented information is kept up to date.

5. Requirements related to the quality system

(continued with framework conditions for our companies)



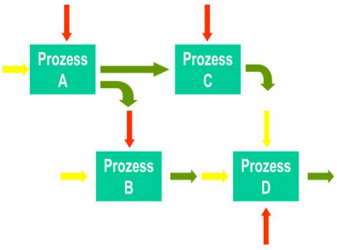
4.4 QM system and its processes

4.4.1 Our QM system has been developed and implemented on the basis of the latest applicable release of ISO 9001.

It is maintained and continuously improved along with the requisite processes, including their interactions.

Due to the requirement for internal organizational decisions, the processes that are relevant to our QM system are mapped out in company-wide, standardized software (GPD) and on other suitable media in relation to the process workflow from the quotation through to the invoicing stage, including

a) required inputs and planned process results,
b) sequences and interactions,
c) criteria and procedures (with monitoring, measurements and the associated indicators) that assure the execution and control of these processes,
d) the resources required for these processes and their availability,
e) the responsibilities and authorities specified for these processes,
f) the risks and opportunities that have been determined in line with the requirements stated in Section 6.1 in Chapter 5 of this QM manual,
g) the evaluation of these processes and the resulting changes to ensure that these processes yield the intended results and
h) the improvement of the processes and the QM system.



4.4.2 Documented information

This is
a) updated and maintained in order to support the processes and also
b) retained as evidence that the processes are carried out as planned.

Dokumente

DMS	Name	Titel
Nein	2016_0005	Anzugsmomente CP Befestigungsschrauben
Nein	2016_0003	Montage von Laufbuchsen
Nein	2016_0002	Datenerfassung Getriebeprotokoll in InfoPath
Nein	2016_0001	Erfassen von Stempelbildern

5. Requirements related to the quality system

(continued with Leadership)

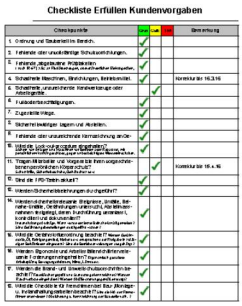
5 Leadership

5.1 Leadership and commitment

5.1.1 General

By way of the company and quality policies detailed in Chapter 3 of this QM manual, the company demonstrates leadership and commitment with regard to the QM system by

a) taking on responsibility for the effectiveness of an appropriate and efficient QM system,
b) ensuring that the quality policy and objectives of our QM system have been defined and are consistent with the applicable external and internal framework conditions and our company policy,
c) ensuring that the requirements of the QM system have been integrated into the business processes of our organization,
d) promoting the use of process-related and risk-based approaches,
e) ensuring that the resources required for the QM system are made available,
f) communicating the significance of an effective QM system and the importance of meeting the requirements of the QM system,
g) ensuring that the QM system yields the planned results,
h) deploying, instructing and supporting people in order to safeguard the effectiveness of our QM system,
i) encouraging improvements and
j) supporting managers in emphasizing their leadership role within their area of responsibility.



Checkliste Erfüllen Kundenvorgaben

Checkpunkte	Ja	Teil	Nein	Bemerkung
1. Ordnung und Sauberkeit im Bereich.	✓			
2. Fehlende oder unvollständige Schutzvorrichtungen.	✓			
3. Fehlende, abgelaufene PKB/Etiketten und Prüfplaketten, und Prüfer Bestätigungen.	✓			
4. Schadhafte Maschinen, Einrichtungen, Betriebsmittel.	✓			Korrektur bis 16.3.16
5. Schadhafte, unzulässige Handwerkzeuge oder Arbeitsgeräte.		✓		
6. Fluchtwegbeschädigungen.	✓			
7. Zugewachsene Wege.	✓			
8. Sicherheitswidrige Lagern und Arbeiten.	✓			
9. Fehlende oder unzulässige Kennzeichnung an Gebäuden, Lagern und Arbeitsplätzen.	✓			
10. Wird die Lackierkabine ordnungsgemäß betrieben?	✓			
11. Tragen Mitarbeiter und Vorgesetzte Ihrem aufgabenbezogenen persönlichen Körperschutz? Schutzhelm, Sicherheitsschuh, Schutzbrille usw.		✓		Korrektur bis 16.4.16
12. Sind die FIFO-Tonnen okay?	✓			
13. Werden Sicherheitsbelehrungen durchgeführt?	✓			
14. Werden die Arbeitsbereiche sauber, aufgeräumt, ordnungsgemäß, sicher, Gefahrenquellen und Hindernisse beseitigt, ohne Durchfahrung, ausreichend, konsequent und sicherstellt? Werden die Arbeitsbereiche sauber und aufgeräumt gehalten? Werden die Arbeitsbereiche sicherstellt? Und die Arbeitsplatzbedingungen sicherstellt vorhanden?	✓			
15. Wird die Gefahrenbeurteilung, Stichprobe? Werden Gefahrenbeurteilungen durchgeführt? Werden die Gefahrenbeurteilungen durchgeführt? Wird die Gefahrenbeurteilung durchgeführt?	✓			
16. Werden Begehrlichkeit und Arbeitsbereichsbereichsbereich Fortbildungsmaßnahmen durchgeführt? Begehrlichkeit und Arbeitsbereichsbereichsbereich Mitarbeiter.	✓			
17. Werden die Brand- und Brandschutzübungen durchgeführt? Brandschutzübungen werden regelmäßig durchgeführt? Brandschutzübungen werden regelmäßig durchgeführt?	✓			
18. Wird die Checkliste für Fremdfirmen oder Zeitarbeiter u. Fremdfirmen oder Zeitarbeiter ausgefüllt? Wird die Checkliste für Fremdfirmen oder Zeitarbeiter ausgefüllt?	✓			

5.1.2 Customer focus

As the company management, we demonstrate leadership and commitment by ensuring

a) that our customers' requirements and statutory and regulatory provisions are understood, defined and met,
b) that the risks and opportunities that influence the requirements placed on our products and services, as well as the ability to enhance customer satisfaction, are defined and addressed, and
c) that priority is given to enhancing customer satisfaction.

5.2 Policy

5.2.1 Establishing the quality policy

This is established and documented in Chapter 3 of this QM manual. It is implemented, updated and

a) is appropriate to the purpose and the framework conditions of our organization and supports its strategic orientation,
b) provides a framework for setting quality objectives,
c) includes a commitment to satisfy specified requirements and
d) includes a commitment to improve the QM system on a continuous basis.

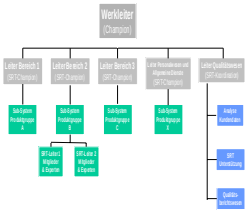
5. Requirements related to the quality system

(continued with Leadership)

5.2.2 Communicating the quality policy

It is

a) described as documented information in Chapter 3 of this QM manual and updated as required,
b) communicated within the organization by managers, is understood and applied, and is
c) available to relevant interested parties - to the appropriate extent.



5.3 Organizational roles, responsibilities and authorities

Responsibilities and authorities, including functions that are relevant to the effectiveness of the QM system, are established and communicated in job and task descriptions and organizational charts, and are understood, in order to ensure that

a) that the QM system meets the requirements of ISO 9001,
b) the processes deliver the intended outputs,
c) the performance of the QM system and opportunities for improvement are reported, in particular to our company management (see Section 9.3 in Chapter 5 of this QM manual),
d) customer focus is promoted throughout our organization, and
e) the integrity of our QM system is maintained when changes to it are planned and implemented.

5. Requirements related to the quality system

(continued with planning)

6 Planning

6.1 Actions to address risks and opportunities

6.1.1 Our QM system planning takes into account the issues referred to in Section 4.1 in Chapter 5 as well as the requirements referred to in Section 4.2 in Chapter 5 of this QM manual as well as the determined risks and opportunities in order to

a) ensure that our QM system can deliver the planned results,
b) further improve these results,
c) avoid or reduce any risks to the results and achieve improvements.

6.1.2 As the company management, we plan

a) actions to address these risks, such as
   - avoiding a risk, taking a risk in order to pursue an opportunity, eliminating the causes of risks, changing the likelihood or consequences, sharing the risk, or retaining risk by making an informed decision, and
   - opportunities such as adopting new methods, launching new products, opening new markets, addressing new customers, building partnerships, using new technology and other planned opportunities to address the needs of our organization or its customers.
b) how to
   1. integrate the actions into the QM system processes (see Section 4.4 in Chapter 5 of this QM manual) and
   2. evaluate the effectiveness of these actions.

The actions taken to address risks and opportunities are proportionate to the potential impact on the conformity of our products and services to the requirements.

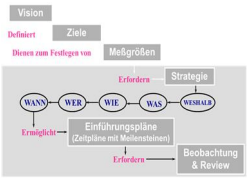
6.2 Quality objectives and planning to achieve them

6.2.1 Quality objectives have been established for relevant functions, levels and processes.
They

a) are consistent with our company and quality policies,
b) are measurable,
c) take requirements into account,
d) are relevant to the conformity of our products and services to the requirements and to enhancement of customer satisfaction,
e) are monitored,
f) communicated and
g) updated, if necessary.

Documented information regarding this is retained.

5. Requirements related to the quality system
(continued with support)



6.2.2 As part of our planning process for achieving our quality objectives, we have determined
a) which objectives are applicable,
b) what resources are required to achieve the objectives,
c) who is responsible for this,
d) when they are completed, and
e) how their results will be evaluated.

There is documented information regarding this.

6.3 Planning of changes

Any changes to the QM system are planned in advance (see Section 4.4 in Chapter 5 of this QM manual).

These take into account
a) the purpose of the changes and the potential consequences,
b) the preservation of the QM system's integrity,
c) the availability of resources and
d) the allocation of or changes to responsibilities and authorities.

7 Support

7.1 Resources

7.1.1 General

The resources required for the establishment, implementation, maintenance and continual improvement of our QM system have been determined, with due consideration for
a) the capabilities and availability of these resources and
b) of external providers, such as suppliers.

7.1.2 People

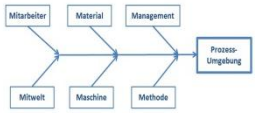
The employees responsible for implementing, operating and controlling the QM system have been determined and deployed.

7.1.3 Infrastructure

The infrastructure required for executing the processes to meet the requirements placed on our products and services is put in place and maintained.
This includes:
Production sites with their facilities, service areas, machinery and assembly equipment, tools, devices, operating materials, maintenance in line with requirements, servicing, communication systems (hardware and software), buildings, associated utilities, equipment including hardware/software and transportation resources.

5. Requirements related to the quality system

(continued with support)



7.1.4 Process environment

The work and process environment has been determined and put in place and is maintained in order to execute processes and ensure that our products and services conform to requirements.
This also includes the

a) social,
b) psychological and
c) physical factors defined in our company and quality policies.

These can differ substantially depending on the products and services in question.

The processes involved in meeting personnel, physical and other work environment requirements at our sites such as noise, temperature, humidity, hygiene, lighting and weather are planned and monitored centrally together with the bodies responsible for occupational safety. This also includes health protection, occupational safety, working methods and environmental conditions.

There is documented information regarding this.

7.1.5 Monitoring and measuring resources

7.1.5.1 General

Resources have been determined and put in place to ensure reliable monitoring and measurement results for the incoming goods inspection, manufacturing, assembly and final inspection stages and as a precondition for verifying that our products and services conform to requirements.
It is ensured that these resources

a) are suitable for the monitoring and measurement activities and
b) are maintained.

There is documented information regarding this as evidence of the fitness for purpose of the for monitoring and measurement resources.

7.1.5.2 Measurement traceability

When measurement traceability is required, measuring equipment is

a) calibrated or verified, or both, on a regular basis or prior to use, against measurement standards traceable to international or national measurement standards; when no such standards exist, the basis used for calibration or verification is retained as documented information,
b) labelled in order to determine its inspection status, and
c) safeguarded against mis-adjustments, damage or deterioration to avoid the calibration status and measurement results from being invalidated.

If the measuring equipment is found to be unfit for its intended purpose, appropriate action is taken.

There is documented information regarding this, e.g. inspection instructions and calibration certificates as evidence.

5. Requirements related to the quality system

(continued with support)

7.1.6 Organizational knowledge

The knowledge necessary for planning and executing our processes to achieve conformity of our products and services to the requirements is determined and documented in job/task descriptions. This also includes:

a) company-specific knowledge such as work experience, lessons learned from failures and successful projects, verbally capturing and sharing knowledge and experience, as results of improvements in processes, products and services that are used and communicated to achieve our company objectives, and
b) knowledge from external sources such as standards, universities, conferences, gathering knowledge from customers or external providers.

This knowledge is imparted using training measures such as the SCHOTTEL Academy and is available as documented information to the extent necessary.

Based on the current knowledge of our employees, altered requirements and developments are also taken into account in order to determine how additional knowledge can be acquired and made available, and how to adapt it.

There is documented information regarding this, which describes the safeguarding of company-specific knowledge such as the knowledge transfer procedure involved in assigning employees to functions after long-standing, qualified and experienced employees go into retirement.

7.2 Competence

a) The necessary competence of employees whose activities have an impact on the performance and effectiveness of our QM system has been specified in job/task descriptions.
b) It is ensured that the employees are qualified for the role on the basis of appropriate education, training and experience.
c) Where applicable, actions are taken (e.g. training, mentoring, re-assignment, hiring of or contracts with qualified persons) to acquire the necessary expertise and skills.
   The effectiveness of the actions taken is evaluated following their implementation.
d) Documented information is retained as evidence.

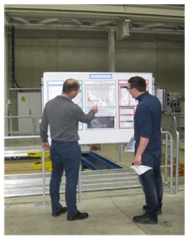
7.3 Awareness

Our company and quality policies described in Chapter 3 of this QM manual prescribe, and our managers ensure, that employees are aware of:

a) the quality policy,
b) the relevant quality objectives,
c) their contribution to the effectiveness of our QM system and that by adopting a positive attitude towards quality, they can improve their own work,
d) the implications of not complying with the requirements of our QM system.

5. Requirements related to the quality system

(continued with support)



7.4 Communication

The internal and external communications relevant to our QM system have been determined and address when, with whom, how and about what communication takes place and who carries out communication.

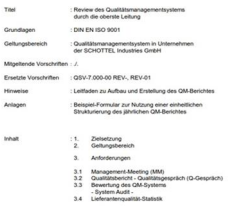
a) Internal communication includes, for example, the promotion of quality awareness in the form of regular meetings in work groups, quality circles, poster and signage campaigns concerning quality topics with varying themes etc.
b) External communication includes, for example, regular meetings with customers and interested parties concerning topics that have an impact on our QM system.

7.5 Documented information

7.5.1 General

Our QM system includes documented information such as this QM manual (QMM), quality guidelines (e.g. SSQ, QSP), QM procedural instructions, QM inspection instructions, superordinate instructions etc. This information supports the effectiveness of our QM system.
Its extent depends on the respective size of the organization, the type of activities, the processes, products and services, the complexity of the processes, their interactions and the competence of the employees.

There is documented information regarding this.



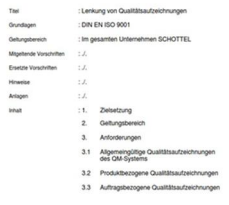
Titel	: Review des Qualitätsmanagementsystems durch die oberste Leitung
Grundlagen	: DIN EN ISO 9001
Geltungsbereich	: Qualitätsmanagementsystem in Unternehmen der SCHOTTEL Industries GmbH
Mitgeltende Vorschriften	: ./.
Ersetzte Vorschriften	: QSV-7.000-00 REV-, REV-01
Hinweise	: Leitfaden zu Aufbau und Erstellung des QM-Berichtes
Anlagen	: Beispiel-Formular zur Nutzung einer einheitlichen Strukturierung des jährlichen QM-Berichtes
Inhalt	: 1. Zielsetzung 2. Geltungsbereich 3. Anforderungen 3.1 Management-Meeting (MM) 3.2 Qualitätsbericht - Qualitätsgespräch (Q-Gespräch) 3.3 Bewertung des QM-Systems - System Audit - 3.4 Lieferantenqualität-Statistik

7.5.2 Creating and updating

When creating and updating documented information, it is ensured that it

a) is identified and described appropriately (e.g. title, date, author or reference number, current revision status),
b) has an appropriate structure (e.g. language, software version, graphics) and media (e.g. paper, electronic) and
c) is reviewed and approved with regard to suitability and adequacy before it is released.

There is documented information regarding its application and content.



Titel	: Lenkung von Qualitätsaufzeichnungen
Grundlagen	: DIN EN ISO 9001
Geltungsbereich	: Im gesamten Unternehmen SCHOTTEL
Mitgeltende Vorschriften	: ./.
Ersetzte Vorschriften	: ./.
Hinweise	: ./.
Anlagen	: ./.
Inhalt	: 1. Zielsetzung 2. Geltungsbereich 3. Anforderungen 3.1 Allgemeingültige Qualitätsaufzeichnungen des QM-Systems 3.2 Produktbezogene Qualitätsaufzeichnungen 3.3 Auftragsbezogene Qualitätsaufzeichnungen

7.5.3 Control of documented information

7.5.3.1 The documented information required for our QM system is controlled. This serves to ensure that

a) it is available and suitable for use where and when it is needed,
b) it is protected (e.g. remains legible and easily recognizable, protected from loss of confidentiality and improper use) and
c) the unintentional use of invalid documented information is prevented and that it is appropriately identified if it is to be retained.

There is documented information regarding this.

5. Requirements related to the quality system
(continued with operation)

Benennung	Verantwortung für die Archivierung	Ordnungs-Kriterium	Archivierungs-Dauer (Jahre)
Management-Meeting-Protokoll (MM)	GL	KW / Jahr	Unbefristet
Personalakte mit Dokumentation – Schulung	KL	Name	Unbefristet
Qualitätsmanagement-Handbuch (QMH)	TQS	Fortlaufende Nr.	Unbefristet
SCHOTTEL Norm Qualität (SNQ)	TQS	Fortlaufende Nr.	Unbefristet
QS Verfahrensanweisung (QSV)	TQS	Fortlaufende Nr.	Unbefristet
Normen und Regelwerke	KDV	Fortlaufende Nr.	Unbefristet
SCHOTTEL Konstruktions-Norm-Handbuch (SKN)	KDV	Fortlaufende Nr.	Unbefristet
SCHOTTEL EDV-ORG-Handbuch (EDV-ORG)	KDV	Fortlaufende Nr.	Unbefristet
SCHOTTEL Handbook	VRI	Fortlaufende Nr.	Unbefristet
SCHOTTEL Entwicklungs-Handbuch	TFE	Fortlaufende Nr.	Unbefristet
SCHOTTEL Service-Handbuch – Checklisten	SKD	Fortlaufende Nr.	Unbefristet
Interne Auditberichte	TQS – Spez. WQS – Werner	Jahr	10
Qualitätsgespräch-Berichte (Q-Gespräche)	TQS – Spez. WQS – Werner	Monat / Jahr	10
Lieferanten-Qualitäts-Statistik	TQS	Monat / Jahr	10
SLC TQS Besprechungs-Berichte	TQS	Jahr	10
Auswertung von Maschinen- und Prozessfähigkeitsuntersuchungen	TQS	Bezeichnung der Maschine	10
Dokumentation Prüfmittelverwaltung	TQS	Bezeichnung des Prüfmittels	Unbefristet
Arbeitsanweisungen	Ersteller	Name	Unbefristet
Organisationsanweisungen	Ersteller	Name	Unbefristet
EDV-Benutzerhandbuch	Ersteller	Name	Unbefristet

7.5.3.2 The following has been established for controlling documented information such as procedural instructions and evidence of results achieved (with regard to, for example, generally applicable, product-related and order-related records of quality-related processes):

a) distribution, access (e.g. permission to view only and/or to view and change), retrieval and use,
b) storage/saving and protection, including legibility and retrievability,
c) control of changes (e.g. version control),
d) retention and disposition, and
e) documented information that is also protected against unintended alterations and retained as evidence of conformity.

Documented information of external origin (e.g. from suppliers, customers) necessary for planning and operating our QM system is identified and controlled.

8 Operation

8.1 Operational planning and control

The processes needed to meet the requirements for the provision of our products and services as well as to implement the actions determined in Section 6 in Chapter 5 of this QM manual are planned, implemented and controlled (see Section 4.4 in Chapter 5 of this QM manual) by

a) determining the requirements for the products and services, and
b) establishing the criteria for
   1. the processes and
   2. the acceptance of our products and services,
c) determining the necessary resources to achieve conformity to our product and service requirements,
d) implementing control of the processes in accordance with the requirements,
e) determining, maintaining and retaining documented information,
   1. ensuring that the planned processes are carried out and
   2. demonstrating the conformity of our products and services to the requirements.

It is ensured that the planning result is suitable for the operational procedures.

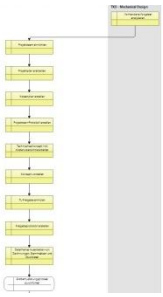
Changes are monitored and the consequences of unintended changes are evaluated and action is taken to avoid complaints and risks, as necessary.

The entire procedure, from the quotation right through to the invoicing stage, is defined as documented information in relation to the process workflow in the form of product and order-related QM plans in the company-wide standardized software (GPD) and on other suitable media (see also Section 4.4 in Chapter 5 of this QM manual).

With regard to outsourced processes, the nature and extent of control are determined in the form of a process description in documented information (see also Section 8.4 in Chapter 5 of this QM manual).

5. Requirements related to the quality system

(continued with operation)



8.2 Requirements for our products and services

8.2.1 Customer communication

This includes:

a) providing information relating to our products and services,
b) handling enquiries, contracts or orders, including changes,
c) feedback from customers relating to our products and services, including customer complaints,
d) handling or controlling customer property, and
e) establishing special requirements for contingency actions, where relevant.

There is documented information regarding this.

8.2.2 Determining the requirements for our products and services

It is ensured that

a) these are defined, including
   1. statutory and regulatory requirements,
   2. those requirements that we consider necessary and
b) the requirements can actually be met before committing to them.

There is documented information regarding this.

8.2.3 Review of the requirements for our products and services

The relevant departments and employees are qualified to meet our customers' requirements for our products and services.
Before committing to supply a product to customers or to perform a service for customers, a review is conducted in line with the following criteria:

a) the requirements specified by the customer, including requirements for delivery and post-delivery activities,
b) the self-evident requirements not stated by the customer, but necessary for the specified or intended use,
c) the requirements specified by SCHOTTEL,
d) statutory and regulatory requirements applicable to our products and services, and
e) requirements in the contract or order that differ from requirements specified previously.

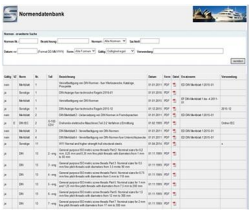
Requirements in the contract or order that differ from requirements specified previously are clarified.

If the customer does not provide a documented statement regarding his requirements, the customer's requirements are confirmed before the order is accepted.

There is documented information regarding this.

5. Requirements related to the quality system
(continued with operation)

8.2.3.2 Documented information is retained regarding
a) the results of the review and
b) any new requirements for our products and services.



8.2.4 Changes to requirements for products and services
The existing documented information also includes updates and notification of the persons affected with regard to changed requirements.

8.3 Design and development of our products and services
8.3.1 General
The design and development process comprises
a) new developments,
b) new designs and
c) design variations.
This process is implemented and maintained in order to ensure the provision of products and services.

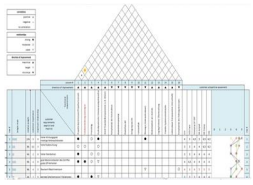
There is documented information regarding this.

8.3.2 Design and development planning
The respective stages and control measures involved in planning have been defined (e.g. as a flow chart for development and design).
The following points are taken into consideration:
a) the nature, duration and complexity of the development activities,
b) the required process stages, including design and development reviews,
c) the design and development verification and validation activities,
d) the responsibilities and authorities involved in the design and development process,
e) the internal and external resource needs for the design and development of our products and services,
f) the control of the interfaces between employees involved in the design and development process,
g) the involvement of customers and users in the design and development process,
h) the requirements for provision of products and services, and
i) the level of control expected for the design and development process by customers and other relevant interested parties, and the documented information required as evidence that the design and development requirements have been met.

There is documented information regarding this.

5. Requirements related to the quality system

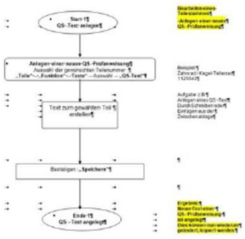
(continued with operation)



8.3.3 Design and development inputs

The key specific requirements to be developed for each type of product or service have been determined.
These take into account:

a) market requirements, competition monitoring, innovation,
b) functional and performance requirements,
c) knowledge gained from previous similar design and development activities,
d) statutory and regulatory requirements such as those from ship classification societies,
e) standards, codes of practice etc.,
f) potential consequences of failure due to the nature of the products and services.



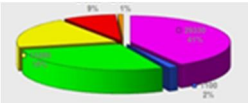
The inputs are adequate for design and development purposes, complete and unambiguous.

Conflicting design and development inputs and the like are resolved by means of reviews.

Documented information regarding design and development inputs is retained.

8.3.4 Design and development controls

These are used in the design and development process for verification or validation purposes in order to ensure that:



a) the results to be achieved are defined,
b) reviews are conducted to evaluate whether the results of design and development meet the requirements,
c) verification activities are conducted to ensure that the design and development outputs meet the specifications included in the development inputs (e.g. by way of risk analyses such as FMEAs),
d) validation activities are conducted to ensure that the specified application or intended use of our products and services meet the requirements,
e) actions are taken to address problems identified during the reviews, or verification and validation activities, and
f) documented information on these activities is retained.

5. Requirements related to the quality system

(continued with operation)

Titel : Spezifikation für gegossene Teile aus Sphärguss (EN GJS und EN GJSA-Ni)

Grundlagen : DIN EN ISO 9001

Geltungsbereich : Im gesamten Unternehmen SCHOTTEL Zusatzforderungen zu DIN EN 1563 und DIN EN 13835

Mitgeltende Vorschriften : DIN EN 1563, DIN EN 13835, DIN EN 10204, DIN EN 1559-1-3, DIN EN ISO 12944-4, DIN EN 12680-3, DIN EN ISO 945-1 oder ASTM A247, Vorschriften der Schiffklassifikationsgesellschaften Anstrichspezifikation SCHOTTEL Id. No. 10980053

Ersetzte Vorschriften : SNQ-603 / E REV. (QS-248/91), REV-01, REV-02, REV-03, REV-04, REV-05, REV-06

Hinweise : /.

Anlagen : /.

Inhalt : 1. Zielsetzung
2. Geltungsbereich
3. Anforderungen

3.1	Herstellungsverfahren	3.8	Qualitätsnarz
3.2	Werkstoffe	3.9	Kennzeichnung
3.3	Prüfungen nach DIN EN 1559-1-3	3.10	Zulassung
3.4	Innere Beschaffenheit der Wandstärken	3.11	Prüfungen nach DIN EN 10204
3.5	Äußere Beschaffenheit der Gussteile	3.12	Konservierung
3.6	Zerstörungsarten	3.13	Verpackung
3.7	Reparaturschweißungen		
	4.	Modelle	
	5.	Erstmusterprüfung	
	6.	Vorrang	

8.3.5 Design and development outputs

Procedures and processes ensure that the design and development outputs

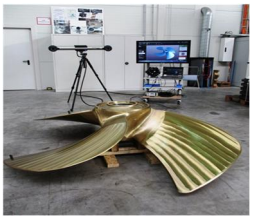
a) meet the requirements specified in the development inputs,
b) are adequate for the subsequent processes for the provision of products and services,
c) include or reference monitoring and measuring requirements – as appropriate – and acceptance criteria, and
d) specify the characteristics of products and services that are essential for their intended purpose as well as their safe provision as per specifications.

Documented information regarding design and development outputs is retained.

8.3.6 Design and development changes

Changes during, or subsequent to, the design and development of our products and services are identified, reviewed and controlled in order to avoid risks to compliance with the changes.
Documented information is retained regarding

a) design and development changes,
b) the results of reviews,
c) the authorization of the changes and
d) the actions taken to avoid risks.



8.4 Control of externally provided processes, products and services (e.g. by suppliers)

8.4.1 General

There are procedures in place to ensure that externally provided processes, products and services (e.g. by suppliers) meet the requirements.

Control measures are implemented for externally provided processes, products and services when

a) products and services from external providers are intended for incorporation into our own products and services (e.g. further processing or installation of supplied parts within our assembly operations),
b) products and services are provided directly to the customers by external providers on behalf of our organization (e.g. the supplier delivers components to the customer's installation site, such as a shipyard, for example) or
c) a process, or part of a process, is provided by an external provider as a result of a decision by our company management (e.g. surface treatment of our components, such as coating, by an external provider).

Documented information regarding these activities is retained.

5. Requirements related to the quality system

(continued with operation)

8.4.2 Type and extent of control

Procedures and processes ensure that externally provided processes, products and services do not adversely affect our company performance and that our customers receive products and services that meet the requirements.

Our company ensures

a) that externally provided products and processes are monitored via our QM system (e.g. incoming goods inspections, initial sampling),
b) that the controls for external providers have been defined and the controls are applied on the basis of the output (e.g. by selecting suppliers according to quality criteria, supplier audits etc.),
c) that
   1. the potential impact of the externally provided processes, products and services does not limit our own ability to consistently meet statutory, regulatory and customer requirements (e.g. by providing evidence of the manufacturability of the products offered by suppliers during the development and design stage of our products),
   2. the controls applied by the external provider are effective (e.g. by carrying out supplier audits)
d) that verification or other activities have been determined in order to meet the requirements placed on externally provided processes, products and services (e.g. ISO 9001 certification, quality inspection certificates etc.).

There is documented information regarding this.

8.4.3 Information for external providers (e.g. suppliers)

There are procedures in place to ensure that the adequacy of requirements placed on external providers is verified before they are approved.

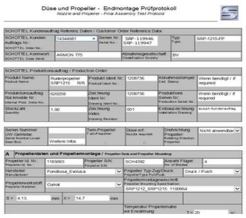
The following requirements are communicated to the external providers in this regard:

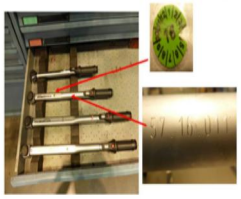
a) the processes, products and services to be provided,
b) the approval of
   1. products and services,
   2. methods, processes and equipment, as well as
   3. the release of products and services.
c) competence, including the required qualification of persons,
d) cooperation of the external provider with SCHOTTEL,
e) control and monitoring of the performance of each external provider commissioned by SCHOTTEL and
f) verification or validation activities that SCHOTTEL, or its customer, intends to perform at the external providers' premises.

There is documented information regarding this.

5. Requirements related to the quality system

(continued with operation)





8.5 Production and service provision

8.5.1 Control of production and service provision

Control procedures apply to all product realization processes, such as manufacturing, assembly and inspection steps, including interfaces to Sales, Engineering and Customer Service (maintenance), thus ensuring controlled conditions.
These include:

a) the availability of documented information that defines:
   1. the characteristics of the products to be manufactured, the services to be provided, or the activities to be performed,
   2. the results to be achieved, such as specifications,
b) the availability and use of monitoring and measuring resources,
c) the implementation of monitoring and measurement activities at the relevant stages to verify that the criteria for controlling our processes or outputs, and the acceptance criteria for products and services, have been met,
d) the use of an infrastructure and environment for the operation of processes,
e) competent employees with the necessary qualification,
f) validation and regular additional inspections to assess the ability to achieve the planned results of processes, production or services, where the output cannot be verified by subsequent monitoring or measurement in a cost-efficient manner. These processes have been identified and the inspection methods have been validated (e.g. for welding processes),
g) the implementation of actions to prevent human error (e.g. using risk analyses such as FMEAs) and
h) the implementation of release, delivery and post-delivery activities (e.g. maintenance, service at the customer's site).

There is documented information regarding this.

8.5.2 Identification and traceability

Our processes are subject to specifications (e.g. type plates, stickers, stamps, accompanying documents or a software-supported feedback system).

They apply to all stages of the product realization process for the entire production and service provision – from receipt of goods, through each stage of processing, storage or assembly of the finished parts until delivery – and include the respective status of the outputs of the monitoring and measurement requirements.

If traceability is required, the outputs are uniquely identified and traceable and are retained as documented information.

5. Requirements related to the quality system

(continued with operation)

8.5.3 Property belonging to customers or external providers

(e.g. suppliers)

Provided this is within SCHOTTEL's scope of control or is used by SCHOTTEL, there are agreements with regard to how materials, components, tools and equipment, business premises, intellectual property and personal data are handled.
This also includes identification, verification, protection and safeguarding.
If the property of a customer or external provider is lost, damaged or otherwise found to be unsuitable for use, this is reported to the customer or external provider.

The documented information regarding this is retained.

8.5.4 Preservation

Identification, handling, contamination control, packaging, storage, ageing, shipping or transportation and protection have been specified (e.g. for in-plant transportation, storage, transportation to and installation at the customer's site) in order to ensure conformity to the product and service requirements.

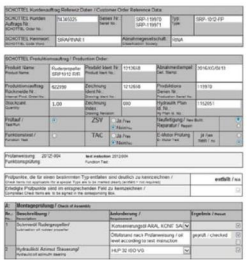
There is documented information regarding this.

8.5.5 Post-delivery activities

Requirements for products and services following delivery or provision of the service, e.g. warranty claims, contractual obligations such as maintenance services, customer service and supplementary services such as recycling or final disposal have been specified and are met.
This also includes

a) statutory and regulatory requirements,
b) potential consequences associated with the products and services,
c) the nature, use and planned lifetime of the products and services,
d) customer requirements and
e) customer feedback.

There is documented information regarding this.



8.5.6 Control of changes

Changes to production, such as technical modifications to products, processes or services, are reviewed and controlled in order to ensure conformity to the requirements.

Documented information regarding this is retained, describing the results of the review of changes, the persons who authorized the change and the actions arising from the review.

5. Requirements related to the quality system

(continued with operation)

8.6 Release of products and services

Inspections are carried out at each stage of production to verify whether the requirements for our products and services are met.

The products and services are not released until the requirements have been fully met, unless approved by other competent bodies such as customers or authorities.

Documented information is retained with regard to the release of products and services. It also includes:

a) evidence of conformity to the acceptance criteria and
b) traceability to the persons who authorizing the release.

8.7.1 Control of non-conforming products and services

Non-conforming or suspect products and services are identified, controlled and documented in order to prevent their unintended use or delivery. This also applies to non-conforming products and services detected after delivery of products, during or after the provision of services.

According to the specifications in our company and quality policies, every employee is obliged to segregate and label products that do not conform to the specified quality characteristics.

Actions to eliminate non-conformities are initiated, carried out and documented by the divisions in conjunction with Quality Management.

Non-conforming products and services are dealt with as follows:

a) correction,
b) segregation, containment, return or suspension of the approval of the products and services,
c) informing the customer (if required) and
d) application for approval under concession.

Non-conforming or suspect products and services that have been corrected must be re-inspected.

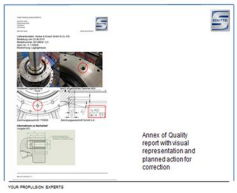
The documentation pertaining to the non-conformity, the corresponding actions taken, any concessions and the competent body that made the decision on how to deal with the non-conformity must be retained in the form of a written record.

There is documented information regarding this.

8.7.2 Documented information on non-conforming outputs

Documented information is retained that

a) describes the non-conformity,
b) describes the actions taken and
c) describes any concessions obtained and
d) identifies the competent body that made the decision on what action to take in relation to the type of non-conformity.



5. Requirements related to the quality system

(continued with performance evaluation)

9 Performance evaluation

9.1 Monitoring, measurement, analysis and evaluation

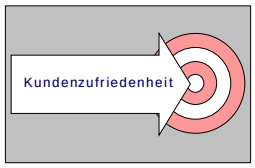
9.1.1 General

Each form of documented information, such as inspection instructions, inspection logs, production inspection plans, NC/CNC programs etc., determines

a) what is to be monitored and measured (e.g. components, product, process or service characteristics),
b) the methods for monitoring, measurement, analysis and evaluation needed to ensure valid results,
c) when the monitoring and measurement takes place and
d) when the results of this are to be analyzed and evaluated.

The performance and effectiveness of our QM system is evaluated within the framework of product, process and system audits as well as management reviews.

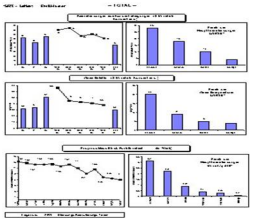
There is documented information regarding this, including retention of evidence relating to the results.



9.1.2 Customer satisfaction

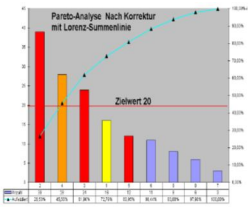
Our global sales and service network monitors statements by our customers (e.g. complaints) with regard to compliance with their specifications and expectations.
Possible methods of capturing, surveying and checking this information include customer surveys, feedback on products and services provided, meetings, internal analyses e.g. of market shares, positive/negative feedback, warranty claims etc.

There is documented information regarding this.



9.1.3 Analysis and evaluation

The data and information with regard to the monitoring and measurement of our products, services, processes and systems are analyzed and evaluated from receipt of goods right through to the final inspection on the basis of key indicators.



The results serve to evaluate:

a) the conformity of the products and services,
b) the degree of customer satisfaction and
c) employee satisfaction,
d) the performance and effectiveness of the QM system,
e) the successful implementation of planning,
f) the effectiveness of actions taken to address risks and opportunities,
g) the performance of external providers (e.g. suppliers) and
h) the need for improvements to the QM system.

There is documented information regarding this.

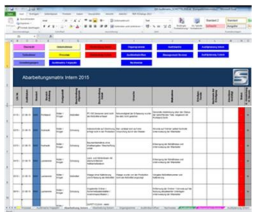
5. Requirements related to the quality system

(continued with performance evaluation)

9.2 Internal audits

9.2.1 These are conducted on a regular basis to evaluate the extent to which the standard requirements for our QM system are (e.g. as a product, process, procedural and system audit).

9.2.2 The audit programmes are scheduled and take place regularly. The methods, responsibilities and requirements with regard to planning and reporting have been defined with due consideration for the importance of the processes concerned, changes affecting the organization and the results of previous audits.



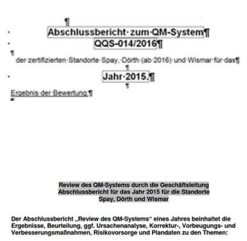
The audit criteria and the scope of the audits have been determined, the selection of the auditors ensures that the auditing process is conducted objectively and impartially.

Audit results are reported to our company management, corrections and corrective actions are implemented promptly and the specified documentation is retained as evidence that the audit programme was carried out and as evidence of the audit results.

9.3 Management review

9.3.1 General

The company management evaluates the suitability, adequacy and effectiveness of our QM system as well as its alignment with the company and quality policies in order to ensure that the QM system is effective. There is documented information regarding this procedure.



9.3.2 Management review and its inputs

This review is planned and takes the following aspects into account:

a) the status of actions from previous management reviews,
b) changes to external and internal issues that are relevant to the QM system,
c) information on the performance and effectiveness of the QM system, including trends in
   1. customer satisfaction and feedback from interested parties,
   2. the extent to which quality objectives have been met,
   3. process performance and conformity of our products and services to the requirements,
   4. complaints and corrective measures,
   5. monitoring and measurement results with regard to process performance and product conformity,
   6. audit results,
   7. the performance of external providers (e.g. suppliers),
d) the adequacy of resources,
e) the effectiveness of actions taken to address risks and opportunities (see Section 6.1. in Chapter 5 of this QM manual) and
f) opportunities for improvement.

There is documented information regarding this.

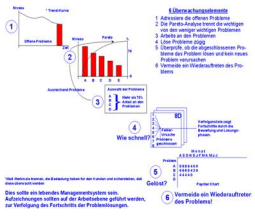
5. Requirements related to the quality system
(continued with improvement)

9.3.3 Management review outputs

They include decisions and actions related to
a) improvements,
b) changes to the QM system and
c) resource needs.

Evidence of the management review results is retained.

There is documented information regarding this.

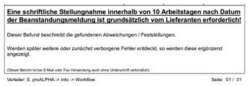


10 Improvement

10.1 General

Improvements such as corrections, corrective actions, continual improvement, breakthrough changes, innovation and reorganization are identified and defined, and actions are implemented in order to meet customer requirements and enhance customer satisfaction (e.g. addressing issues/complaints in work groups etc.).
These include:
a) improvements to our products and services in order to meet requirements as well as to address future needs and expectations,
b) correcting, preventing or reducing adverse effects and
c) improving the performance and effectiveness of the QM system.

There is documented information regarding this.



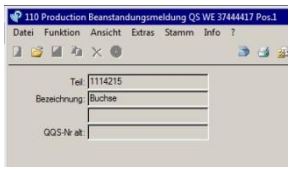
10.2 Non-conformities and corrective action

10.2.1 With regard to deviations from specifications (e.g. from complaints)
the following applies:
a) Take action to control and correct the non-conformity and deal with the consequences,
b) evaluate the need for action to resolve the causes of a non-conformity in order to prevent it from recurring or occurring elsewhere, by
   1. reviewing and analyzing the non-conformity,
   2. investigating the causes of the non-conformity,
   3. investigating whether comparable non-conformities exist in similar processes and products or could potentially occur.
c) implement actions,
d) review the effectiveness of corrective actions,
e) update the risks and opportunities identified during planning, if applicable, and
f) amend the QM system, if necessary.

The corrective actions are appropriate to the non-conformities.

5. Requirements related to the quality system

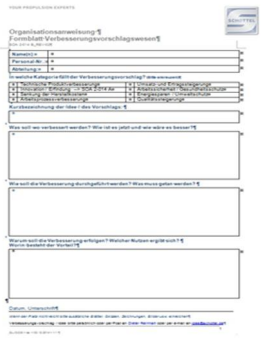
(continued with improvement)



10.2.2 Documented information is retained as evidence

a) of the nature of the non-conformities, the relevant actions taken and

b) the results of any corrective action.



10.3 Continual improvement

The suitability, adequacy and effectiveness of our QM system are continually improved (e.g. employee participation in company suggestion schemes and in quality circles etc.).

The results of analyses, evaluations and the management reviews are taken into account regarded as part of this continual improvement.

There is documented information regarding this.

6. Abbreviations

ISO	International Standard Organization
DIN EN ISO 9001	To be applied for certification and contractual purposes
QMS	Quality Management System
QMM	Quality Management Manual (QMH)
SSQ	SCHOTTEL Standard Quality (general quality guidelines) (SNQ)
QSP	Quality Standard Procedural Instruction (general quality guidelines) (QSV)
PI	Procedural Instruction (VA)
GPD	proAlpha Business Process Designer for mapping processes
WI	Work Instruction (AA)
II	Inspection Instruction (PA)
FMEA	Failure Mode and Effects Analysis

German abbreviation in brackets (..)

Notice: Figures and pictures are only part of the requirements of this manual, if they are marked with "Figure ...". All other figures and pictures are for illustration only.

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