Supplier Manual Voith Turbo

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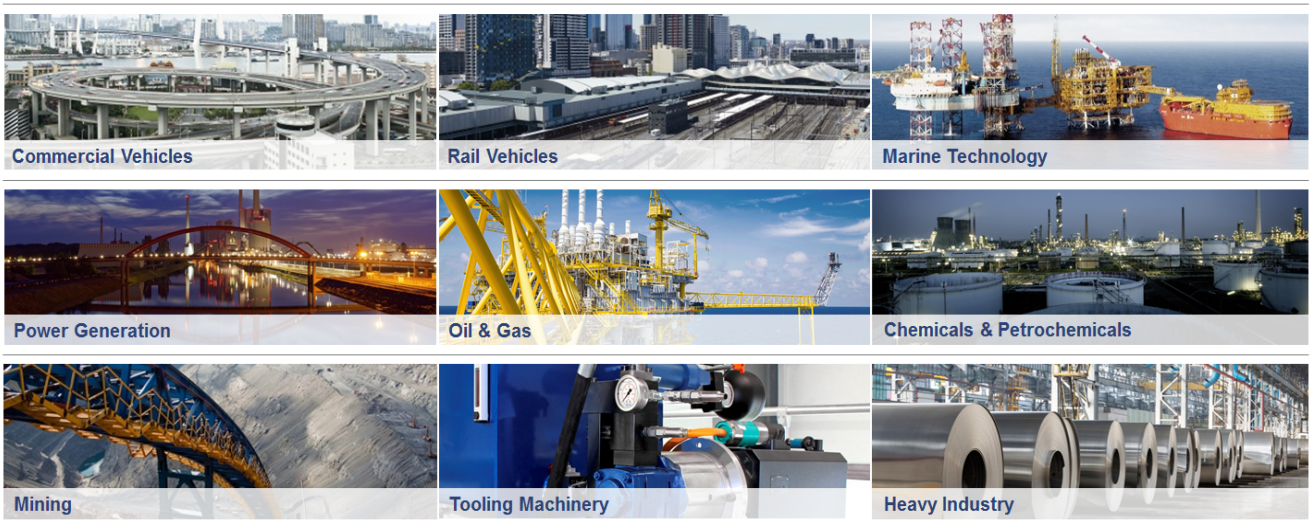

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List of Abbreviations

Abkürzung / Abbreviation	Bedeutung / Meaning
AIAG	Automotive Industry Action Group / *Automotive Industry Action Group*
CMRT	Conflict Minerals Reporting Template
ECHA-SCIP	European Chemical Agency - Substances of Concern In Products
FMEA	Fehler-Möglichkeits-Einfluss-Analyse / *Failure mode and effect analysis*
IMDS	Internationales Material Daten System / *International Material Data System*
LkSG	Lieferkettensorgfaltspflichtengesetz / *Act on Corporate Due Diligence in Supply Chains*
MC	Materialspezifische Konformität / *Material Compliance*
MFU	Maschinenfähigkeitsuntersuchung / *Machine capability study*
MSA	Messsystemanalyse / *Measurement System Analysis*
PA/PA	Prozessverfahrensanweisung / *Process instruction*
PFU	Prozessfähigkeitsuntersuchung / *Process capability study*
PLP	Produktionslenkungsplan / *control plan*
PPAP	Production Part Approval Process nach AIAG *Production Part Approval Process according to AIAG*
PPF	Produktionsprozess- und Produktfreigabe nach VDA / *Production Process and Product Approval according to VDA*
ppm	Parts per million / *Parts per million*
PurONE	IT system for Voith Purchasing (Supplier Lifecycle Management)
Q-Analysen	Qualitätsanalysen / *Quality Analysis*

QG	Meilenstein / *Quality Gate*
QM-System	Qualitätsmanagement-System / *Quality Management-System*
QS-Stellen	Qualitätssicherungs-Stellen / *Quality Assurance*
QSV / *QAA*	Qualitätssicherungsvereinbarung / *Quality Assurance Agreement*
QVP / *AQP*	Qualitätsvorausplanung / *Advanced Quality Planning*
Run@Rate	Produktionsausbringung bei entsprechender Qualität / *Production output with appropriate quality*
SAP	Europäischer Softwarehersteller / *European Software Manufacturer*
SCIP	Europäische Datenbank für Konfliktmaterialien in Produkten / *European Database for Substances of Concern In Products*
SPC	Statische Prozessregelung / *Statistical Process Control*
SPICE®	Software Process Improvement and Capability Determination
VDA	Verband der deutschen Automobilindustrie e.V. / *German Automotive Industry Association*
VN/VS	Voith-Norm / *Voith Standard*
VT	Voith Turbo

1 General Requirements

1.1 Scope of Supplier Manual VT

The Quality Policy in connection with the QAA applies to all contracts between the parties. It describes the minimum requirements for our suppliers. Additionally, customer and location specific requirements do apply.

The present quality policy does not replace the requirements of DIN EN ISO-9001, IATF-16949, ISO/TS-22163, QS-9000, VDA volumes and more applicable requirements for the truck and automotive industry but represents only the minimum requirements of the customer. The current versions of these regulations will be applied.

The supplier is obliged to perform his work in accordance with the description of this guideline and the (engineering) standards quoted therein to ensure the quality of his business process and that his products and services are risk-free according to the requirements of Voith Turbo and this guideline.

Voith is increasingly using digital formats, such as online meetings and remote audits, to collaborate with its suppliers. As a supplier of Voith, we expect the willingness to face the digital challenges and to actively participate.

If any provision of this contract is or becomes invalid, the contract remains unaffected. In this case the parties must replace the ineffective provision immediately by a provision that is most closely to the economic purpose of the invalid provision.

Legally binding is only the current German version.

Deviations from the conditions laid down in this Directive require written confirmation by the Purchasing Division of Voith Turbo.

1.2 Business Language

The business language is German or English.

1.3 Code of Conduct and General Basic Rules

The supplier is committed as part of its commercial responsibility to the observance of legal provisions, including laws to protect the environment in connection with the manufacture and distribution of its goods or provision of services. He commits to labor regulations and laws concerning the health of the employees and that child and forced labor is not tolerated.
The supplier also commits to this responsibility for the upstream supply chain (see: Act on Corporate Due Diligence in Supply Chains).

The supplier also confirms with the acceptance of the order to dissociate from any form of bribery and corruption, and not to tolerate this. The buyer refers in this connection to the "VOITH Code of Conduct",

which can be viewed at http://www.voith.com The customer expects the supplier that he is committed to compliance with the rules and principles contained therein and supports their attention.

1.4 Electronic Handling of Business Processes

The handling of business processes is done via defined interfaces. The secure data exchange of sensitive information, especially technical documentation and contract documents are carried over in Secure Data Room Solution Voith Extranet.

2 Becoming a New Voith Supplier

2.1 Quality Management System

The minimum requirement for the necessary QM system for new Voith Turbo suppliers depends on the product area of the respective recipient factory.

For the Commercial Vehicle division, a certified QM system based on the technical specification IATF-16949 is required.

For the Rail division, the minimum requirement is proof of a certified QM system in accordance with DIN EN ISO 9001 as well as the supplier's commitment to develop in the direction of ISO/TS 22163 (IRIS).

For the Industry and Marine division: A certified QM system in accordance with min. DIN EN ISO 9001 is requested.

The quality management system should be aligned to the target “zero defect” and to a continuous improvement process.

The expiry of a certificate without planned recertification must be notified to Voith Turbo at least three months before the expiry date. New certificates are to be sent unsolicited to the purchasing department.

The withdrawal of a certificate must be reported immediately. Voith reserves the right with its customers, to carry out upon notice audits and assessments for quality management system, processes and products.

2.2 Supplier Self-Disclosure

New suppliers are requested by the Voith purchasers to submit a Supplier Questionnaire. The supplier has the specified data access and can update this in the Voith PurONE portal.

Alternatively, the inserted annexed questionnaire "Supplier self-communication" for the Group Division Voith Turbo has to be filled out and can be found in the download area from the supplier ecosystem of Voith Turbo (see appendix).

2.2.1 First Visit

As part of an initial visit, new suppliers are evaluated according to specified criteria. In doing so, the potential to meet the requirements for the requested products and associated processes is evaluated. The supplier's experience and ability to develop and manufacture the requested scope of delivery and its ability to implement customer-specific product and process requirements are considered.

The assessment is generally based on existing processes for similar products. The result is used to prepare the sourcing decision and is a forecast of the quality capability of supplier plant in the event of an order. If required, necessary measures and improvement potentials are agreed. Their implementation must be proven by the first delivery at the latest.

2.3 Framework Contract & QSV

Voith is interested in long-term relationships with suppliers. The basis for successful cooperation is laid in contractual agreements such as a framework agreement and quality assurance agreement (QSV) before the supply relationship is established.

While the principles of cooperation, the legal framework, commercial agreements, logistics and scope of liability are regulated in the framework contract, agreements on quality assurance, quality goals and the complaints process are made in the QAA.
A contractual agreement is a prerequisite for the award of the contract.

3 Product- and Process Development

3.1 Targets of Product and Process Development

Within the project planning the „zero defect strategy „must be considered. Derived from this target other quality targets must be defined.

3.1.1 Project Planning & Project Management

The supplier must have a production management, depending on the scope of the project, which concludes the appropriate steps within the production- and process development.

A project plan is coordinated between Voith and the supplier (with the departments involved) specifically for the project, naming the project managers. The project structure, team members, project managers and their regular communication must be presented to Voith. At the beginning of the project, goals for defined milestones can be defined in a checklist. If necessary, Voith will check the progress of the project using this checklist.

3.1.2 Approval of Product- and Process Development

Within the product and process development, the supplier assesses the development results of the individual milestones (quality gates) or maturity level assurance and signs it off after the target is achieved.

If necessary, Voith will request a self-assessment of the product and production process in accordance with the VDA volume "Maturity Level Assurance for New Parts".

3.1.3 Project Status

For all projects a frequent status report from the supplier is requested in the form of an updated project plan.

3.1.4 Feasibility Study

The supplier is obliged to carry out a feasibility analysis as part of the contract review. The aim of the analysis is to assess the technical specifications (drawings, procedures, process capability, work-material use, manufacturability and general regulatory and legal requirements). These are basically for new parts required and must be revised in product and process changes and newly confirmed.

The feasibility study must be submitted by Voith upon request and is mandatory for awarding the contract. It is compulsory for the placing of orders.
For drawing-changes the feasibility study must be updated.

The documentation is done on the form. The link to download the form can be found in the Voith Turbo download area. (see appendix)
In consultation with Supplier Quality & Development of Voith Turbo the manufacturability analysis can be created on a part-family basis.

3.1.5 Advanced Quality Planning

Advanced quality planning is the foundation for error avoidance and continuous improvement of new and changed products and processes as early as in the planning phase.
The procedure and implementation of advanced quality planning is described in VN/VS 3206.

3.1.6 Targets of Advanced Quality Planning

The Quality Planning is the cornerstone of error prevention and continual improvement of new and modified products and processes which are already in the planning phase.

The aim is to ensure the compliance of all the characteristics of a new or modified product. Actions are taken to ensure the production of goods of high quality in compliance with all requirements for series production.

The AQP includes all Design and Realization phases, including the first manufacturability analysis, the review of technical documents and the system FMEA product, the creation of system FMEA process control plan, design and manufacture, and testing of tools, gauges, the definition of statistical process control (SPC), packaging / carrier / transport / handling as well as the monitoring of components, processes and services from suppliers.

3.1.7 Responsibilities

The AQP at the suppliers includes quality planning for all in-house parts (internal) and purchased parts (external) of the supplier.
If critical items for quality or delivery date are identified within the scope of these activities, the supplier is obliged to inform the respective Voith contact person and to coordinate corrective and compensatory measures.

The AQP meeting generally takes place at the location of the supplier, especially with critical parts (high customer requirements with high technical process and/or development risk) the status of the AQP is checked at the location of the supplier.

The supplier is supported as needed by the development / design, value analysis, QA agencies of the purchaser and the buying department in implementing the AQP.

3.2 Prototype Production & Other Samples

At first delivery of new / modified prototype parts a prototype test report (measurement report, material, function), including index / item number has to be presented (first and last part).

Here all drawing features- or changes have to be documented on at least 2 parts. More volumes will be regulated separately in each individual case. Other patterns are according to DIN 55350 (Part 15) patterns that are not produced under series conditions and/or not according to released drawings and other specifications or not with series operating equipment.

Other patterns are not to be used for the production process and product release. However, these patterns can be used for customer-enabled products if they meet the required specifications. A release of other patterns, such as for testing or installation patterns through the development or construction areas of Voith Turbo, does not mean at the same time the series release and does not waive the PPF / PPAP process.
For the marking of prototypes, other samples and initial samples the yellow marking which can also be found in the Voith Turbo Download area is to be used "first delivery" (see appendix).

3.3 Production Process Planning and Approval

The process for the production process and product release is used to release as part of the product development of system components or production parts. The supplier is obliged to follow the instructions of the PPF and PPAP standard (VDA Volume 2 / AIAG PPAP) in its latest version and all instructions contained in this quality guideline. In addition, existing custom instructions can also apply. Depending on the project, process audits at the supplier are carried out.

VT Industry / Marine:
An initial sample test report shall be prepared depending on the purchase requisition. The initial sample test report must contain at least: Cover sheet according to VDA volume 2, dimensional record, stamped drawing.

The PPAP/PPF documents or initial sample test reports must be sent in advance electronically (PDF format) to the following e-mail address or to the respective contact person at the plant:

Crailsheim:	vtcr.sq@voith.com
Garching:	info-weqs-vtm@voith.com
Heidenheim:	ischdhdokumente@voith.com
Hudiksvall:	info.safeset@voith.com
Hyderabad:	vtipqa@voith.com
Salzgitter:	zeugnisse-schaku@voith.com
Shanghai:	vtcn-q.sq@voith.com
York (PA):	vti-quality@voith.com

In addition, the factory-specific requirements apply about the file designation, the additional handover in paper form and the handover deadlines of the documentation have to be considered.

Before submitting the completed PPAP or PPF documents all PPAP / PPF processes of the sub-contractor must be presented and approved. If Voith doesn't expressly waive those documents, they are to be attached to the PPAP/PPF documents.

3.3.1 Product and Process - FMEA

The FMEA (failure mode and effect analysis) is used for proactive error prevention. By interdisciplinary cooperation, with Voith and sub-suppliers the product risks are to be clarified and to be minimized continuously.
Inspection of the FMEA must be made possible in all phases of development.

The FMEA must be carried out in accordance with the currently valid VDA/AIAG manual.

VT Rail / Industry / Marine:
FMEAs are only to be created at the explicit request of Voith. If an FMEA is required, it must be carried out in accordance with DIN EN 60812. Conformity with the VDA/AIAG manual is recommended.

At the request of Voith an interface FMEA is to be created together with Voith.

This FMEA must be planned within the development or change process in such a way that results and measures can be considered right before essential specifications are made. Essential specifications are, among others, investments in process changes or the production of a sample for long-term testing.

Contents to be considered:
- Customer requirements, specifications, Voith-requirements, other applicable Voith standards
- Function, safety, reliability, Service-friendliness, special characteristics of the customer
- Environmental aspects

- Inclusion of all divisions of Voith and supplier
- Test results
- Interaction of all characteristics between product- and process FMEA

Creation or adaption of FMEAs:

- Development/Production of new parts
- Implementation of new manufacturing processes
- Relocation of a site
- Process changes
- Drawing changes
- Product defects or claims

3.3.2 System-FMEA Product

The product system FMEA is to be carried out for all components, for which development the supplier is responsible.

3.3.3 System-FMEA Process

The methodology of FMEA is to be applied already in the early stages of process development (planning and development). Based on the Product-FMEA and the specific characteristics defined herein, all process steps must be considered in the Process-FMEA. At the same time, similar components are to be included in the consideration (non-variable part, risk of confusion)

FMEAs are dynamic product / process documentations and in this sense, "living" documents. An update of the FMEA must be done when changing the construction / application conditions, the material, concrete changes in the manufacturing and / or assembly processes of a product.

All existing FMEAs have to be screened for at least 2 years to date. A revision must be done and/or a confirmation that the FMEA is still unchanged.

3.3.4 Special Characteristics

Special characteristics include product characteristics or production process parameters that affect the safety or regulatory compliance, function or accuracy of fit.
Regarding special characteristics, the VN/VS 1631-2 must be observed.

The special characteristics are documented in the FMEAs, production control plans and in the documents of the production process including drawings and operating instructions.

VT Industry / Marine:
Chapter 3.3.2 only applies when explicitly requested.

Overview of special characteristics according to VN/VS 1631-2:

„SC“:
All critical – or process characteristics- (e.g. main function, mounting ability, customer connection and process relevance, lifetime)

„DS“:
Features for safety-critical features (e.g. steering, braking and safety restraint systems)

„DZ“:
Features relating relevance to certification (e.g. exhaust emission, crash resistance etc.)
Unless otherwise indicated in the specification, a "zeppelin dimension", test dimension or special feature is to be treated as an SC characteristic with a 100% inspection.

See chapter 4.6 Verification control of special characteristics.

3.3.5 Capability Study

Proof of machine capability study (MFU) and process capability (PFU) must be done for any special characteristic, at the latest with the initial sample. Deviations from the requirements to be agreed with the recipient Voith factories.

Requirements of capability indices for SC-, DS and DZ-features:

Machine Capability/Short term Cm/Cmk ≥ 1.67

Process capability/long term ability of Cp/Cpk ≥ 1.33

Customer project-specific requirements remain unaffected by this regulation.

Machine Capability / Short-term capability to be submitted at start of production. The evaluations of the PFU must be presented for the first time, if at least 25 spot tests with 5 measurements each are done.

Furthermore, on request, the results of the capability evidence must be presented with each amendment sampling.

VT Industry / Marine / Rail:
Alternatively, the machine- and process capability can be proved by a 100% inspection with documentation of the special characteristics as well as through appropriate procedure tests.

3.3.6 Technical Cleanliness

The term technical cleanliness means the sufficiently low-level contamination of cleanliness-sensitive technical components with harmful particles. Technical cleanliness is divided into cleanliness classes. Testing and evaluation are regulated in VN/VS 3221.
The maximum permissible degree of contamination can be found in the relevant specification. If there are no component-specific requirements, the VSK0 (see VN/VS 3221) automatically applies to all deliveries.

3.3.7 Process Flow Chart

The process flow for the manufacturing of the ordered product must be documented with the entire value chain in the process flow diagrams. This already must be presented in the planning phase.

The final status must be submitted to QS locations of the purchaser during initial sampling in accordance with the agreed submission level, see VN/VS 3205.

VT Industry / Marine:
Alternatively, detailed work plans are permitted.

3.3.8 Working Plan

For all individual parts and assemblies work plans are to be created. These must include all information on process steps, internal / external transport, means of transport as well as the used machines and equipment.

3.3.9 Production Control Plan

The control plan represents a planning tool for preventive process validation. It will be prepared by systematic analyzing procurement, manufacturing, assembly and inspection processes in the team. This team should include staff from planning, manufacturing and quality assurance as well as from other departments involved.
Process flow charts, system-FMEA products (if required), results from the system-FMEA processes in consideration of the special characteristics, empirical values from similar processes as well as the application of improvement measures form the basis of the analysis.

3.3.10 Pre-Series Phase

A description of the dimensional tests, as well as material and function tests, which must be performed prior to series production, is to be stated in the control plan and submitted to Voith.

3.3.11 Series Phase

A comprehensive documentation of the product and process features, of the process control measures as well as the tests and measuring systems to be observed during series production shall be stated in the control plan and submitted to Voith.

The control plan needs to define:

- Determination and marking of the test and quality features including tolerances as well as extent and frequency.
- Preparation of the inspection and test schedule
- Provision of facilities and equipment
- Right in time, anticipatory provision of measurement instrumentation and fixtures
- Inspection at appropriate points of the product realization
- Clarification of acceptance criteria and requalification testing
- Machines, equipment, tools
- Control method
- Reaction plan in case of deviations in the process / on the product

VT Industry / Marine / Rail:
As alternative to chapter 3.3.7 working-, test- and inspection plans are allowed.

3.3.12 Test Planning (Planning of Requalification)

The production control plan serves as a basis for preparing of the inspection plan. The content of the inspection plan includes all tests, the content (criteria), order, test frequency, scope of testing, equipment and special characteristics. For special characteristics capability investigations have to be planned.

VT Industry / Marine:
Alternatively, detailed work plans are permitted.
If there are changes in the inspection plan the employees are to be trained accordingly. The implementation of the changes is to be documented.
The annual requalification must be planned by the supplier and documented in the control plan (see chapter 3.3.9)

VT Industry / Marine / Rail:
This paragraph only applies if this is explicitly requested.

3.3.13 Equipment Capability (MSA)

For all planned test equipment, a test equipment capability is to be proved. Test equipment must be available before start of production.
Verification by one of the methods VDA Volume 5 or AIAG MSA.

VT Industry / Marine/ Rail:
Minimum requirement for test equipment: for testing specific features a MSA procedure 1 is required.

3.3.14 Procurement of Production Equipment

The planning and procurement of all necessary equipment, resources and test equipment for manufacturing the devices need to be performed before the production of series parts.

All internal and external means of transport need to be considered. The supplier must verify the suitability / capability of operating and testing equipment. With multi-devices or -molds the ability is to be demonstrated separately.

3.3.15 Identification of Customer ‘s Property

All tools, production and/or test equipment which are the property of Voith must be permanently marked with an appropriate identification (“Voith Property” / .part number / tool identification…).
Use of the tools, production and/or test equipment for other products & customers of the supplier is generally prohibited.

Any deviation from this requirement must be made in writing by Voith.

3.3.16 Capacity

At each project the personnel capacities must be provided timely and before start of production.

3.3.17 Qualification of Staff

Every employee must be trained in case of changes of workplace, process, test equipment or product specification. Evidence must be performed on the content of training and the trained personnel.
Qualifications stipulated by standards must be considered.

Qualification must be maintained by training at regular intervals, with supporting evidence.

New employees must be instructed accordingly, and the effectiveness of the training must be verified.

3.4 Process and Product Approval (PPF / PPAP)

For the release of serial production, all the points defined in the project (quality gates) must be completed.

The release of the process and the product must be documented by all those responsible at the supplier for quality assurance, manufacturing, production planning and other involved areas, with date and signature.

The initial sampling to PPAP or PPF must be approved by Voith. The initial sample test report can be found in the download area of Voith Turbo (see appendix).

3.4.1 Internal Production Release at the Supplier

The release and the start of serial production at the supplier takes place upon completion of all defined Project Objectives (Quality Gates / maturity-degree hedging). The release must be made by the project team of the supplier and must be documented in writing.

VT Industry / Marine / Rail:
This paragraph only applies if this is explicitly requested.

3.4.2 Initial Samples

Initial samples are completely under series production conditions produced and tested products and materials, which are produced with the planned machine, equipment, fixtures and testing agents and processing conditions.

These are to be delivered in the first sample test report, according to the submission levels on the agreed date to the Voith-recipient factory.

To identify the test criteria, consecutive numbers have to be used in the initial sample test report and in the current drawing, approved by Voith Turbo. This "stamped drawing" is part of the initial sample inspection report.

It must be ensured that only the current drawing approved by Voith - recognizable by the "F" in the drawing header - is used.
Modules that have been manufactured according to a Voith construction, including items, have to undergo an initial sample test which has to be provided to Voith.

Deviations from the Voith specifications that are not detected during the process and production release entitle Voith to disapprove such later.
For multiple devices or forms the sampling must be carried out at each device or molding post.

3.4.3 Reason for Initial or Change Sampling

In the following cases, the supplier is obliged to carry out a release procedure:

- For new products and / or new parts or when a product is ordered for the first time. This also refers to DIN- and standard parts.
- According to a product change, at all direct – or indirectly affected characteristics change.
- After changing the drawing index, on all affected features.
- After a changing a subcontractor of the supplier
- After a delivery stop
- After an interruption in supply of more than 12 month.
- For changed production methods and processes
- After use of new / modified manufacturing – devices (e.g.: casting-, stamping-, rolling-, forging-, press tools, in several forms or frequent – forms)
- After production facility relocation or use of new or displaced equipment and / or resources.
- After use of alternative materials and constructions.

VT-Industry / Marine / Rail:
- An initial sampling of catalog and standard parts is only necessary if this is explicitly requested.
- Subsequent sampling intervals for the spare part market might deviate from the above regulation but must be agreed with the respective quality contact at the receiving plant.

Further Exceptions:
In the following cases the supplier can inform the relevant Quality Assurance Department at Voith and can apply for an exception on the procedure and scope of the initial sampling:
- Shipping / production interruption of more than one year
- Small series, customer service parts
- Standard and catalog parts
- Current approval for series delivery by another division of Voith Turbo

3.4.4 Cancelling of Initial Samplings Submission

If a part has already been released by another consumer plant according to production- and process release, a PPF / PPAP process can be omitted, in consultation with the responsible QA office of the Voith plant, under the following condition:

The release must refer to the currently valid specifications and the previous customer plant must have been supplied without impermissible interruptions. The supplier is obliged to submit the release report and recent delivery schedule. Different assembly conditions may still require a release procedure. This also applies to earlier tested and released items from assemblies.

3.4.5 Initial Sample Documentation

The initial sample documentation, as described in section 3.4.2 of this directive, must be delivered at the same time as the initial samples. Missing, incomplete or deficient initial sample documentation are considered in the supplier evaluation in the future.

Initial sample documentation that is not submitted completely will not be sampled by Voith and may result in follow-up costs for the supplier.

3.4.6 Initial Sampling According to 3D Data Model

Measurements must be carried out against the valid 3D data model defined by V/VSN 3212. The number of measurement points should be selected in that way, that all geometries are defined. Details of the measurement must be agreed on with the Quality Representatives of the dedicated plant.

3.4.7 Material Compliance

During the production process the companies have to ensure the material-specific compliance of their products with laws and customer specifications.
Failure to observe the material specifications could lead to product liability risk as well as loss of image and market.
Regulations EG1907/2006 REACH and Electronics Directive 2011/65/EU ROHS as well as Railway Industry Substance List RISL – Europe have to be observed (also see QRL02 “Quality Guideline” – Voith Turbo Material Compliance, see following link).

The declaration of a Compliance Officer, as well as compliance with the mentioned guidelines must be made in the Supplier-Self-Disclosure in Voith PurONE, see chapter 2.2.

On request supplier provides feedback about the usage of conflict minerals by the CMRT-template.

The quality guideline for material compliance can be found in the Voith Turbo download area. (see appendix)

VT Comercial Vehicle:
The material data entry is part of the sampling and a precondition for the release of the production process and product release. The data is entered for the Comercial Vehicle division into the International Material Data System (IMDS).
Voith Main ID: 627

The data records in the material data system must always be checked to ensure they are up-to-date and complete and, if necessary, adapted to the current data collection requirements.

Support regarding IMDS database issues in general or data collection in particular can be requested from the service provider “IMDS Professional”.

VT- Industry / Marine / Rail:
Since 01.01.2021, suppliers must confirm compliance with REACH upon delivery of goods (certificate for delivery or entry in ECHA-SCIP database, communication of SCIP number) due to the applicable EU legal regulations.

4 Series Production Process

4.1 Coordination of Series Control

Basically, all product and process characteristics are important and need to be adhered to. Test intervals and random sampling need to be determined. Special characteristics require continuous proof of qualification. If qualification cannot be proven, 100% testing will be required. Planned series control of the special characteristics needs to be agreed with Voith.

Voith will determine special characteristics in the drawing (marking as per VN/VS 1631).

For the purpose of process control, evidence of the process-capable mastery of quality features is usually provided with short-term capability (MFU) and long-term capability (preliminary process capability, SPC).

Process control of forming processes (e.g. casting, forging, chamfering, deep-drawing, etc.) and thermal treatment (e.g. tempering, annealing) is to be performed batch-/lot-based.

To ensure the material quality of cast parts, spectral analyses per batch with documentation and archiving of the results must be guaranteed.

Monitoring of thermal treatment during further processing (e.g. of forged parts) requires the implementation of Jominy Tests (thermal shock tests) per material lot as per DIN EN ISO 642.

VT-Industry / Marine:
Alternatively, the machine- and process capability can be proved by a 100% exam with documentation of the special characteristics as well as through suitable procedure tests.

4.2 Control of Defective Products

The supplier must have a documented process for controlling defective products and apply it consistently.
This must include the aspects of rework & repair, taking into account the risk, as well as the handling of rejects.

In the case of rework/repairs, approval must be obtained from Voith or - if available - a defect limit or rework catalogue agreed in writing must be consulted.

4.3 Planning of Preventive Maintenance

To ensure the ability to deliver, a system of preventive maintenance of production facilities has to be installed. Apart from the specification of preventive maintenance intervals, an emergency plan must be prepared for those processes influencing the ability to deliver, e.g., for bottleneck machines, special tools and stocking of spare parts. This emergency plan needs to be presented to Voith.

A maintenance plan including the maintenance intervals and scopes of maintenance needs to be prepared. Consistent implementation is to be documented in writing or in the maintenance software.

4.4 Status of Subcontractors and Purchased Parts

Each supplier bears responsibility that all products and services which he procures from subcontractors and uses for Voith products correspond to the Voith directives. For this purpose, each supplier has to prepare own instructions.

If Voith specifies subcontractors, the supplier shall be equally bound to enforce Voith directives towards the subcontractor.

The change of any subcontractor must be communicated to Voith Turbo in a timely manner and requires approval, see 3.4.3 of this manual. A production process and product release has to be performed, see 3.4 of this manual.

Voith Turbo reserves the right to also audit subcontractors. Hereby, the supplier is, however, not released from his responsibility towards the subcontractor and Voith Turbo.

4.5 Centered Production

For controllable features, centered production is to be aimed at. For special characteristics, the command and the capability of the process are to be adhered to and documented by continuous and systematic evaluation of the test results using the statistical process control (SPC). The evaluation of the test results must be carried out according to the regulations.

If the products, regarding these features, are produced in an insufficiently capable process, a 100% check will have to be performed until the production process has been optimized and the required cpk values are achieved.

An evaluation of the SPC records on a regular basis (automatically, if possible) is to be performed from the start of series production at the latest. See VDA volume 4, chapter 7, economic process design and process control.

VT-Industry / Marine / Rail:
The preceding paragraph only applies if this is explicitly required.

4.6 Verification Control of Special Characteristics

Due to the risk of features with "DS" and/or "DZ" features relating to vehicle safety, adherence to legal stipulations and product liability, the requirements of attachment 8 shall apply for the retention periods. These features will be marked in the technical documents if Voith is responsible for the engineering part.

These provisions do not substitute the legal stipulations.

4.7 Special Release

In case of deviations from the specification, release must be obtained, on principle prior to delivery, by using the form "Application for special release" and form "8D report". All deliveries carried out based on a deviation release, need to have additional marking on all load carriers. A copy of the special release document must be added to the delivery documents.

VT-Industry / Marine:
For individual customer projects, the release number of the deviation must be permanently affixed to the component. Contend and location must be coordinated with the Voith Turbo quality contact at the plant.

4.8 Continuous Improvement Process

The supplier undertakes to set up a systematic management system resulting in the continuous improvement of the processes.

For the development and implementation of measures contributing to the continuous improvement process the following items are to be taken into consideration:

- Improvement of the process capability by reducing spreading
- Increase in productivity
- Centering of the processes
- Reduction of testing frequency
- Avoiding rework and wastage
- Analysis of complaints

4.9 Modifications on the Product or Process

Process, product, and procedure changes which have an influence on the product quality and the mechanical or chemical properties of the products must be notified to the orderer in advance and approved by Voith.
Unless otherwise agreed, the supplier's duty to inform is based on the currently valid VDA Volume 2 - Trigger Matrix.

To record the supplier's technical modification requests in a structured way, the supplier first needs to complete the "Questionnaire on technical modifications". This can be found in the download area of Voith Turbo. (see attachment)
For all modifications, the verification/ revision/ update of the FMEA is required to hedge the risks of modification. Deadlines and persons responsible are to be stated for implementing the measures. Voith needs to be immediately informed on necessary constructive changes. For product and process modifications, the feasibility study and evaluation need to be revised and re-confirmed with the work plans, inspection plans and production control plans being updated accordingly.

VT-Industry / Marine / Rail:
The preceding paragraph only applies if this is explicitly required.

4.10 Audit Planning – Product and Process

The supplier needs to prepare an audit planning specifying the annual implementation and the scope of internal product and process audits. VDA volume 6 part 5 is to be applied for product audits and/or VDA volume 6 part 3 for process audits or equal processes. Audits performed at sub-suppliers need to be considered as well.

Other occasions for audits (unscheduled):

- Process qualification within the scope of initial sample release
- Current complaints, decreasing product quality
- Product / process modifications incl. relocation of production
- Irregularities in delivery, wrong deliveries
- Supplier approval

VT-Industry / Rail / Marine:
For these divisions no VDA Audits are required, but audits must be carried out in accordance with the certification.

4.11 Requalification (Series Production)

All products are subject to an annual requalification, including dimension, material, function, etc. Results from current series testing may be included (e.g. series release, results from product audits, initial sampling, other tests). Customer specifications shall serve as the basis.

VT-Industry / Marine / Rail:
The preceding paragraph only applies if this is explicitly required.

Pooling of groups / parts families is permitted in accordance with Voith Quality counterpart. Any deviating tests are to be separately agreed on with Voith.

4.12 Customer Complaint Processing

If the supplier detects any quality defects when inspecting the goods, the supplier needs to inform the customer in writing and unsolicited, particularly regarding any impacts on the end product.
This information shall include suggestions how to eliminate the quality defects.

In these cases, the customer shall inform the supplier immediately on his decision regarding his suggestions on how to take best remedial action. If the customer suffers any damages caused by the detected defects, these shall be fully reimbursed by the supplier in full, unless otherwise agreed.

Notice of defects:
Any deviations identified resulting from assembly problems, laboratory tests, customer complaints or further investigations will be reported to the supplier in writing in the form of a defect notice. However, even after the first telephone information, the supplier initiates the necessary measures for rapid clarification and elimination. Complaints can relate to initial sample parts, series parts and other samples.

Elimination of defects:
If a delivery gets blocked, the supplier will be responsible for the limitation of the work-in-progress. The supplier shall take immediate action, such as e.g. compensation delivery or rework. If this is not possible for reasons of time, the operative Voith Turbo QA department and the supplier shall come to an agreement regarding the initiation of quick special measures to keep up production. For the conditional acceptance of goods, a notice of defects documenting the defects shall be prepared.

Immediate action:
Immediate actions are used to secure ongoing production immediately after an error occurs or to provide error-free goods, e.g. by 100% inspection before delivery of the components to Voith. Voith must be informed of the time/delivery note of the delivery of the checked goods (= clean date). It is also recommended to mark the component. Details on this are to be coordinated with the respective customer plant.
Immediate measures are always unplanned, involve a relatively high level of effort and are limited in time.

8D Report
Irrespective of the customer's 8D requirement, the supplier initiates an internal error analysis and action definition for troubleshooting. Within 10 working days, upon request a written test report for each notice of defects must be presented to Voith on the basis of a completed 8D Report.

Some first information will be expected within 24h stating the description of the defect, the cause of defect and the re-establishing immediate action and/or return of the 8D report (items 1-3 completed).

VT-Industry / Marine:
The preceding paragraph only applies if this is explicitly required.

An objection period of 14 days after arrival of the goods at the supplier applies to the processing of complaints. A complaint can only be rejected in writing based on a comprehensible reason. An amicable solution between the customer and the supplier should be targeted.

Deadline for corrective actions
If the actual root causes are not yet known and the permanent corrective actions to be taken not yet defined (items 4-7 of the 8D report), the immediate action shall be indicated along with the deadline for the completion of the finished 8D report.

100% Control-level
All products are to be inspected 100% regarding the detected defect until the permanent corrective action has been verified. Labeling is carried out in accordance with the recipient plant agreements.

Methods
To effectively determine the root cause, relevant problem-solving methods adapted to the individual problem are to be applied, as e.g.

- Cause-and-effect diagrams (Ishikawa)
- Pareto analyses (ABC analyses)
- 5 Why technique
- Team-oriented problem-solving method (8D method)
- …

Voith Turbo is to be informed on the effectiveness of the corrective action. Voith Turbo reserves the right to verify the complaint processing.

Marking after preceding complaint
If subsequent deliveries from stocks and work in process got 100% inspected due to some defect, same are to be marked until the proven elimination of the defect, unless otherwise agreed. The transportation carriers as well as each individual package item are to be clearly marked. The type of marking needs to be agreed with the respective customer plant.

5 Logistics in The Supply Chain

5.1 Logistics

5.1.1 Packaging Planning

Unless there are project specific agreements, the supplier is responsible for packaging.

The type of packaging needs to be agreed with the relevant Voith departments by the time of initial sampling.

Packaging and transport methods are to be determined so that all parts can be supplied directly and in due time without any damage, contamination, modification and by avoiding any quality risk to production and assembly at Voith. Packaging must guarantee the adherence to the required component cleanliness as per VN/VS3221 VSK0. Higher requirements according to VSK1 – VSK5, if requested on drawing or specification.

If packaging materials are provided by Voith, their fitness shall be checked in collaboration and their use and quantity in circulation determined.

Delivery at the requested date of delivery must be affected in one single transport. Partial deliveries and additional costs resulting thereof for Voith shall not be accepted by Voith without prior agreement and written acceptance on the part of Voith.

Link to the applicable documents can be found in the Voith Turbo download area (see appendix).

5.1.2 Preservation

All products which may be impacted due to interdependencies with their environment are to be protected in a suitable manner. The intended type of preservation described in the order- and delivery instructions is to be observed. Deviations have to be agreed on in a written form.

If Voith does not prescribe any preservation, same must be agreed with the Q-departments at the supplier’s initiative and must be approved of the Voith plants prior to delivery.

5.2 Traceability

A system to ensure traceability needs to grant the limitation of the production period, the production lot, batches as well as the deliveries of the semi-finished goods.

Traceability needs to be ensured at least on a weekly basis. Any further level of detail is to be devised as per a risk assessment and to be agreed with Voith. If necessary, Voith requirements for devising the traceability are to be considered.
If serialization or batch traceability is required by Voith, this must be documented completely traceable.

5.3 Production Output

Production output shall be controlled by a Run@Rate. With Run@Rate the key focus is placed on the quantity of the parts. The series process will be analyzed as to whether it is in the position to produce the number of pieces as stipulated in the contract without any problems. The impacts of weak points on the overall throughput shall be identified in advance. In addition, logistical aspects such as supply and collection of goods or the infrastructure in the production plant shall be considered.

On principle, the Run@Rate will be required to produce new parts, after the relocation of installations as well as after an increase of existing capacities if same have previously not been known and stipulated in the contract.

All aspects of a continuous parts supply shall be considered:

- Capacity check of own supplier
- Waste consideration
- Logistics of supply and collection of goods
- Use of production equipment for other customers
- Breaks, set-up times, repair times and downtimes
- Buffers number and size

VT-Industry / Marine / Rail:
The preceding paragraph only applies if this is explicitly required.

5.4 Emergency Concept

The supplier is requested to develop a concept to protect against emergencies to ensure a stable supply. Both the company's own processes and those of the sub-suppliers must be considered.

The emergency plan must consider significant events such as natural disasters, disruptions to the supply infrastructure and the failure of production facilities or areas. The concept includes detailed and validated measures for preventive and reactive security of supply.

6 Supplier Performance

6.1 Supplier Evaluation

To reach the desired "zero defect target" in the delivery quality (product quality and logistics quality) together with our suppliers, the supply chain management (Procurement and Supplier Quality) and the quality control rely on the agreement of ppm limits.
Compliance with these targets is monitored at the supplier and at Voith. Such agreed ppm values are derived from the amount of delivered defective parts or parts which due to e.g., logistical errors lead to disruptions, in relation to the total number of delivered parts.

These complaints are recorded in the Voith plants and communicated in an official complaint to the supplier.
Technical and logistical errors are recorded and evaluated separately to be able to take appropriate actions. They are up-dated daily.

In monitoring the period of the last 3 months is considered and the delivery quality per month with a trend color (green, yellow, red) assigned. Depending on the trend color persons responsible for the actions and measures are defined at Voith Turbo. Special agreements on individual components or part numbers in specification sheets for example remain unaffected by this model.

6.2 Purpose of the Model

- To record logistical and quality related errors based on SAP-data and to determine monthly ppm values.
- To agree on targets for the quality and logistics performance with the supplier (delivery date and amount)
- Standardized escalation process in order to work out:
  - effective solutions to the key problems of poor quality
  - to show all parties their responsibility for fast and efficient problem solving
  - to create a group-wide framework for structured problem solving
- Defined criteria to support the Voith Turbo quality and logistic staff by the purchasing department.

6.3 Goal of Ppm Agreement

ppm agreements serve the purpose of achieving the zero-defect target for each vendor part. For these intermediate goals (ppm intervention limits) are determined.

Terms:

ppm	parts per million (Engl.) for the period selected
calculation ppm	$\frac{\text{faulty quantity under complaint}}{delivered\ quantity} \cdot 1\,000\,000$
Ppm-Agreement:	Framework agreement to achieve the zero-defect target. For several part numbers and/or groups Framework agreements are made

Example from the Q-Analysis:

Supplier	Name	Group	Cat.	Status	No. receipts	No. Compl.	Complained	Received	Fault rate PPM	C	Q2 2223	Q3 2223	Q4 2223	Q1 2324	Q2 2324	Selec-tion
xxx	xxx	1	NS	AS	12	0	0	4.265	0							

6.4 Target Agreement Process

In the interests of continuous development and quality improvement, a reduction in target values is agreed with suppliers on a recurring basis over several years.

Considering the defined product groups, the production technology used and the "benchmarks" in competition with similar suppliers, deviating intervention limits with the supplier can be agreed on with the supplier.

6.5 Monthly Monitoring

The data collected in the ERP system errors (defects) are updated daily in the “Q-Analysis Supplier” and rated with a traffic light color.

After completion of the quarter, the trend color preview for the current quarter is updated. After completion of the quarter, the trend color is calculated from the combination of traffic light colors of three months.

6.6 Process Steps and Scheduling

- Coordination of intervention limits with the supplier.
- With the access code to the Voith portal "Q-Analysis Supplier", the supplier can view the current evaluation and the specified target values at any time.
- Every supplier is requested to regularly monitor the current quality evaluation regarding delivery quality and logistics on the Voith portal “Q-Analysis Supplier” and to initiate measures if necessary. Changes to access must be requested through the purchasing contact.

6.7 Targets and Procedure of Escalation Process

The escalation process is applied when the classification of the quality of delivery is yellow or red, and the problem can’t be solved by the parties alone.

Goals of the method are:

- Find solutions to major problems during the supply relationship with the supplier.
- Create balance between the interests of Voith Turbo and the supplier's responsibility.
- Show all parties their responsibility for fast and efficient problem solving.

An overview of the escalation process in quality and logistics deficiencies see VN/VS3207.

7 Specific Requirements

7.1 Software and Components with Integrated Software

Suppliers who develop or deliver software or electronic components with integrated software must meet the requirements of Automotive SPICE, with respect to the process maturity level. Unless otherwise specified, the maturity level 3 is to be proved in an external assessment in accordance with the requirements of VDA Bands "Automotive SPICE Process Assessment Model".

If necessary, Voith reserves the right to carry out an assessment at the supplier.

7.2 Functional Safety of Electronic Components, Software, and Components with Integrated Software

Suppliers, who develop and/or deliver security-related electronic components, security software or security-related electronic components with integrated software for functional safety must base the development and production on the "latest state of technology" (IEC DIN EN 61508, ISO 13859, ISO 26262, DIN 50126 current release)

Relevant documents must be submitted by the supplier on Voith request.

Basically, safety parts and relating documents and records are to be consistently explicitly marked in the entire development and production process.

The necessary safety requirements for the agreed delivery and their safety level (SIL / ASIL) are determined by Voith in the corresponding specifications. Implementation of safety requirements (e.g. design and implementation) must be agreed with Voith as part of a specification or a special agreement (e.g. ISO 26262).

8 Attachment

8.1 Retention Periods

The supplier must determine and assure to archiving times for documents, records and reference samples.
The following minimum requirements must be met:

	Document type	Start of archiving time	Documents	Archiving Time
Default documents	Documents from the product and process development phase as well as from the production phase of the delivery item, e.g., process descriptions, production control plans, specifications, drawings, or test instructions.	After product discontinuation at Voith Turbo for series and spare parts requirements or after the document has been modified	Documents related to critical features.	15 years
			All others	10 years
Records	Records from the product and process development phase as well as from the production phase of the delivery item. Delivery item, e.g., measurement protocols, control charts, audit reports, reviews, Evaluations	With the delivery of the product, which includes the records for product and associated process.	Documents related to critical features.	15 years
			All others	10 years
	Records and documents for process and product release (PPF, PPAP) including reference samples	After product discontinuation at Voith Turbo for series and spare parts requirements	All	15 years

- **SC:** Archiving Time **≥ 10 years** after EOP (End of Production)
- **DS/DZ:** Archiving Time **≥ 30 years** after EOP (End of Production)

These specifications do not replace the legal requirements. Modified retention periods (up to 30 years or the service life of the product) are recommended against the background of the limitation periods for product liability claims or are agreed on a product-specific basis.

8.2 Links

Link PurOne: PurOne Login

Supplier ecosystem | Voith
Link to the following documents:

- Confidentiality Agreement
- Request for Release under Concession
- Supplier Assessment Main Criteria
- Questionaire Technical Modification
- Manufacturability Analysis
- Supplier Self Disclosure
- Initial Sample Test Report
- Initial Sample Labelling
- Quality Guideline Material Compliance QRL02
- Self-Evaluation Product and Process
- VN/VS 1631-2
- VN/VS 3206
- VN/VS 3207
- VN/VS 3205
- VN/VS 3221
- IMDS-Guideline and example
- etc.

8.3 Production Sites Voith Turbo

J.M. Voith SE & Co.KG I VTA
Schleißheimer Straße 101
85748 Garching,Germany

J.M. Voith SE & Co.KG I VTA
Voithstraße 1
74564 Crailsheim, Germany

J.M. Voith SE & Co.KG I VTA
Alexanderstraße 2
89522 Heidenheim, Germany

J.M. Voith SE & Co.KG I VTA
Centrumstraße 2,
45307 Essen, Germany

J.M. Voith SE & Co.KG I VTA

Schuckertstrasse 15
71277 Rutesheim, Germany

J.M. Voith SE & Co.KG I VTA
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Voith Turbo Safeset AB
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