ELECTRIC DRIVES

FOR EVERY DEMAND

# VEM Quality Guidelines

Revised version 01 of June 2018

We are at home in the following branches:

- Transportation
- Machine and plant engineering
- Steel and rolling mills
- Cement and mining industry
- Shipbuilding
- Chemical, oil and gas industry
- Water management
- Renewable energy
- Power plant technology

There are currently around 30 million electric machines bearing the VEM badge in use around the world. They are found aboard ships, in trains and trams, and in chemical plants and rolling mills. VEM generators produce electricity in hydropower plants and wind farms. The VEM product range embraces variable-speed electric drive systems, special motors and special machines for outputs ranging from 0.06 kW to 60 MW, as well as a diversity of drive technology and power generation components.

# VEM Quality Guidelines

## Content

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## 1. Objective

Objective and purpose of these VEM Quality Guidelines is to enable suppliers to adapt their products and services to the requirements of VEM with regard to quality.

Increasing the value of the company through sustainable corporate management is anchored in the corporate objectives of VEM. Improving quality should contribute to this.

We strive for close and long-term co-operation with our suppliers and aim to achieve this goal together.

## 2. Scope

These quality guidelines apply for all suppliers and service providers of VEM (hereinafter both referred to as supplier). They are a component of the job order and therefore binding. Further specifications require separate arrangement between VEM and individual suppliers, for example in the form of a quality assurance agreement.

As a rule, the Terms of Purchasing of VEM apply in business transactions. These can also be downloaded from the VEM website.

If the supplier is unable to fulfil one or more of the requirements of these quality guidelines, then he shall inform the VEM Purchasing department of this in writing and obtain corresponding exclusions.

## 3. Management systems

The VEM companies are certified to DIN EN ISO 9001, DIN EN ISO 14001 and DIN EN ISO 50001. The requirements of these certifications are bundled in the objective of only working with partners that have established a quality management system (QM system) and who develop this further and monitor it at regular intervals.

Within VEM, environmental effects are recorded, analysed and evaluated in order to reduce environmental impact. The supplier also commits himself to observe at least all statutory regulations as per ISO 14001 Environmental Management.

Protecting the health of our employees is a key part of our company philosophy. VEM ensures that thestatutory requirements of industrial health and safety are implemented and observed. We also expectthis of our suppliers. These commit themselves to all relevant regulations and other requirementsbinding upon them, maintaining product safety for customers, consumers and employees with regard to industrial health and safety.

To the extent that the supplier provides services on a VEM site, he shall be obliged to observe the VEM regulations for contractors and regulations covering the conduct of employees on the site.

If the supplier also receives supplies or avails himself of services, he shall include these suppliers in his QM system or secure the quality of the supplies himself. In this case supplier qualification is to be sought.

## 4. General requirements of co-operation

VEM seeks to achieve long-term co-operation with its supplier partners. This should result in the continuous qualification of the suppliers and subsequently ensure continual improvements in quality.

The basis for these supplier relationships is open communication in dialogue. Contacts for suppliers are the respectively-responsible purchasers at VEM or the contract for quality issues.

VEM only purchases goods and/or services from suppliers that satisfy quality requirements and are approved for delivery. The approval of suppliers follows a specified supplier selection procedure.

Main suppliers of VEM are required to undertake self-disclosure and are graded according to the principal criteria of quality, price, punctuality of delivery and service. The results are communicated to the suppliers and possible improvements in the supplier relationship specified in the form of measures to be taken.

The supplier grants VEM and its customers as well as regulatory bodies the right to inspect the effectiveness of the QM system on site and to participate in testing of the subjects of contract. In supplier audits the supplier processes are examined by the VEM Purchasing and Quality Management departments. The supplier shall be informed of the audit at least four weeks in advance.

In addition to these Quality Guidelines, VEM strives to conclude Quality Assurance Agreements (QAA) with its key suppliers. These should contain precise details of the requirements of the quality of the goods and services as well as the outgoing goods and incoming goods inspections. In such a case the supplier shall appoint a contact for quality issues.

## 5. VEM order documents

With the order or order amendment the supplier receives technical documents (drawings, specifications, technical terms of supply, manufacturing specifications, test records to be completed etc.). The supplier shall ensure that all further documents belonging to these documents, such as standards, test specifications, forms etc. are present. In this he shall check the order documents to ensure that he is able to implement all requirements at his organisation.

If documents are missing, which could delay or hinder delivery, these are to be requested from VEM immediately after checking the order.

On accepting the order the supplier confirms the necessary capacities required to meet the specified delivery date.

## 6. Quality objectives

All processes must be aligned towards "zero defects", 100 % delivery reliability and optimisation of costs. By implementing these Quality Guidelines the supplier pursues the intention of lowering costs and minimising defects that could result in guarantee claims. At the same time, this should also serve to enhance the efficiency of the co-operation.

The focus lies on avoiding defects through the use of suitable processes and quality-assuring measures with parallel continuous improvement.

## 7. Quality assurance

### 7.1 Quality assurance in development

With the assumption of development tasks by the supplier he shall also be responsible for the quality of the drafts. The supplier commits himself to developing the products in accordance with the respective framework supply contracts, individual or development assignments and the descriptions, specifications, data sheets, drawings, patterns or models contained therein.

The supplier is to implement suitable product validation and verification measures to ensure quality ssurance in the development phase. Possible risks are to be analysed, documented and suitable risk minimisation measures put in place (e.g. via an FMEA). At the request of VEM the supplier shall present a risk-minimisation concept.

The test planning is to be based on the findings of the risk analysis and, where not prescribed, coordinated with VEM. The supplier also commits himself to initial sample testing (see point 7.5) as well as, on request, endurance testing.

All details and results of development are to be documented and archived for at least ten years.

### 7.2 Quality assurance of vendor parts – supplier qualification

All unplanned assignments to sub-suppliers require the authorisation of VEM. If the supplier procures goods or services from sub-suppliers, he shall contractually incorporate this supplier in his QM system or secure the quality of the supplies himself. Certified sub-suppliers are to be given preference during the selection process.

VEM may demand that its suppliers furnish written verification that these have verified the QM system in place at the sub-suppliers and/or have secured the quality of the supplies via other measures.

The supplier shall also take care to ensure that his sub-suppliers observe statutory regulations regarding environmental management, product safety for customers, consumers and employees as well as industrial health and safety.

### 7.3 Process quality requirements

The supplier is obliged to observe the relevant technical regulations (e.g. DIN, VDI, VDE, DVS etc.) in all procedures. Should the supplier determine that requests in the order contravene the applicable technical regulations of the trade, then he shall clarify this with the Purchasing department at VEM prior to providing his performance.

The supplier shall regularly monitor the effectiveness of his processes, in particular with regard to process safety. By employing preventive maintenance he shall ensure that the tools, machines and equipment used are operational at all times. Processes that have a direct influence on product quality must be issued with corresponding key data for monitoring. At the request of VEM the supplier shall present this key data. Should the key data reveal a deterioration in the process result, suitable measures shall be made by the supplier to correct and prevent this, with notification of VEM.

Special processes such as welding, surface finishing, soldering, impregnating, crimping or winding are to be monitored and controlled in accordance with the process situation (see point 12).

## 7.4 Quality assurance in manufacturing

The supplier shall ensure that all goods and services that he provides correspond to the specifications of the job order. He shall provide proof of product quality at regular intervals by submitting his goods and services to a quality control (e.g. incoming goods, manufacturing, process and final inspections). To this end the supplier shall maintain a test plan, which is to be adapted to the requirements of his products, processes or the order as required. VEM reserves the right to demand quality assurance plans and to supplement these where required.

Tests and inspections carried out are to be documented with the aid of a test record (type of test record dependent on the order text). Test dates are to be stated to VEM on request in order to allow VEM to participate. The required test records are generally a component of the supplier documentation.

The supplier shall employ suitable testing and measuring equipment and systematically check the adherence to the permissible tolerances for the testing and measuring equipment for proof of performance (calibration). Calibration is to be undertaken on the basis of measurement standards that are themselves based on international or national measurement standards. At the request of VEM the supplier shall identify the measuring equipment used to carry out quality testing.

In the interests of continuous improvement the supplier shall keep suitable records of defects and failures that occur in manufacturing as well as in the field. On the basis of these updates of product or process FMEA shall be undertaken or the quality assurance plans adapted. Avoidance of failure or defect repetition and thereby the lowering of costs of non-conformity are the focus here.

## 7.5 First article inspection (FAI)

With the initial sample testing the supplier provides proof that reproducible series manufacturing can be assumed.

Initial sample testing is to be carried out where this is stipulated in the order placed by VEM (in the case of semi-finished products initial sample testing may not be required where an acceptance test certificate 3.1 as per EN 10204 is supplied). VEM reserves the right to participate in initial sample testing.

Initial sample testing of series products occurs in the case of:

- Initial order
- New components
- Following supply gaps ≥ 2 years
- Model changes in cast parts
- Material changes in base material (not attachment parts)
- Changes in manufacturing processes and/or conditions
- Forwarding of performance to sub-suppliers

The basis for testing is the specifications prescribed by VEM.

The supplier is required to utilise testing equipment for the initial sample testing that is suitable for testing products made by the supplier and sub-suppliers in accordance with the state of the art and the prescribed specifications. If the test requires specific test facilities that the supplier does not have, then an external test establishment is to be appointed, with the agreement of VEM. VEM reserves the right to propose a suitable test establishment.

For each initial sample test a corresponding initial sample test report is to be drawn up and submitted to VEM. To rule out mistaken identity the labelling of the initial sample must occur on the part itself and be noted clearly and permanently on the exterior of the package. A reference to the prescribed serial number must be provided.

Following receipt of the initial sample and the initial sample test report VEM may undertake its own or additional tests and decide the following:

a) Approval
b) Approval with conditions (verifiable fulfilment of conditions by the supplier)
c) Rejection, repeat sampling required (presentation of a new initial sample with initial sample test report by the supplier).

Approval of the initial sample by VEM does not release the supplier from the duty to maintain the required quality of his product.

## 7.6 Outgoing goods inspection

The supplier commits himself to conduct an outgoing goods inspection. The type and scope as well as documentation of this is specified in the order or in the scope of a QAA. The supplier shall at the least conduct an outgoing goods inspection as the conclusion of his production process and document this suitably, for example via test records or measurement protocol. Proof of the inspection is to be submitted to VEM with the delivery.

VEM shall conduct an incoming goods inspection and document this. In the scope of a QAA the incoming goods inspection may be co-ordinated with the outgoing goods inspection of the supplier.

VEM and its suppliers commit themselves to inform one another mutually of the findings of the respective inspections in order to enhance their effectiveness.

## 7.7 Control of defective products

The supplier shall take suitable measures to exclude the supply to VEM of goods and services that have been rejected or not improved and refused, directly or indirectly. He shall establish and maintain a system for the control of defective products.

Repairs or deviations from the drawings require prior written authorisation from VEM in the form of a non-conformity report (NCR). This report is to be submitted by e-mail to the specified address immediately after discovery of the defect using the designated form.

In the non-conformity report the reason for the deviation and the corrective measure to be initiated are to be stated to VEM. In the event of approval the report / application is to be supplied together with the clearly-labelled product. In the case of delivery of larger quantities the deviating parts are to be delivered separately. VEM reserves the right to propose measures to avoid the recurrence of defects. Similarly, VEM may also examine the effectiveness of measures introduced.

1) In the event of a repair the supplier is also obliged to supply a product free from defects after permission has been granted. The rectifications may only be carried out following receipt of permission from VEM and may only be carried out by qualified personnel.
2) In exceptional cases VEM may agree to tolerate parts that do not satisfy specifications.Tolerated defective parts may only be shipped to VEM following approval.

The approval of a deviation does not constitute a waiver of warranty and liability (release) claims on the part of VEM with regard to the delivery of the defective products.

Deviations subsequently recognised are also to be notified to VEM in writing without delay. This notification to VEM should include delivery number, part numbers affected and the number of defective parts. Furthermore, the stock at the supplier and the parts in the supply chain are to be inspected, blocked where necessary and communicated to VEM.

If VEM discovers deviations in the scope of the incoming goods inspection - when processing the goods or on receiving customer complaints - with the supplier responsible for these deviations, then VEM shall notify the supplier without delay. Following awareness of the defect the manufacturer commits himself to rectification or replacement delivery. Furthermore, he shall take suitable measures to avoid the recurrence of the defect and document these measures. VEM reserves the right to demand a qualified 8D report, depending on the severity of the defect. This report is to be presented to VEM within three working days, completed to at least point D3. The effectiveness of the measures specified within the 8D process is also to be sufficiently verified.

Generally, the supplier receives the right to rectification of defects (at the premises of VEM or, taking account of cost and effort, at his own premises). VEM may demand replacement delivery within the scope of the statutory claims for defects. In any case VEM shall pass on the costs incurred within the scope of complaints to the supplier. Together with the notification of defects the supplier shall also receive an itemisation of the costs incurred by VEM as a result of defective delivery.

# 8. Relocation of activities, changes in series, availability

If the supplier intends to relocate the order partially or completely in the form of a sub-contract, this shall require the prior authorisation of VEM. This also applies accordingly for changes during the processing of the order.

In the event of a sub-contract the specifications of VEM are to be passed on to the sub-contractor. It is essential to ensure that all documents are forwarded to the sub-contractor in full, in their respectively valid form. Point 14 of these guidelines is to be observed with regard to this.

Changes that influence the product or process quality also require the authorisation of VEM.

These changes concern

- changes to the manufacturing process and to process parameters,
- changes to the inspection of the products or in the QM system,
- the use of new machines and tools,
- changes in the place of manufacturing,
- the use of new materials, this regards all raw materials and auxiliary supplies as well as
- the use of new hazardous substances and substances and materials with effects on the environment.

Technical changes in the design of series products in the course of substitutions, rationalisation or technical advances are to be communicated to VEM without delay. VEM reserves the right to issue a new series approval (see point 7.5). In any case, VEM is to be informed of these changes at the earliest possible moment and the altered parts clearly labelled on delivery.

The supplier is to ensure the availability of components for VEM. Discontinuations are to be communicated in writing at least six months in advance.

## 9. Packaging and storage

The supplier is responsible for the orderly packaging and cleanliness of his delivery. Packing is to be undertaken in such a way as to ensure that the product is protected against damage or soiling as a result of environmental influences and that it cannot be damaged in the course of delivery. In order to be able to store ordered products for longer periods the supplier is obliged to notify VEM of corresponding storage and maintenance requirements as well as instructions regarding these.

If a best-before date (BBD) is to be observed, the date of manufacture of the product is also to be stated in addition to this.

Where deliveries fall under the Ordinance on Hazardous Substances(GHS), these are to be packed in accordance with the respectively-valid laws, regulations and ordinances and labelled in a clearlyvisible manner.

## 10. Identification and traceability

The supplier commits himself to labelling the deliveries adequately. The minimum scope of the labelling comprises:

- VEM order number
- Supplier name and location
- Appellation or part reference
- Part number and/or batch number
- Quantity or partial quantity
- Date of manufacture
- BBD
- Information regarding hazardous substances
- Possible changes to the series

The process of creating the product, the use and location of a delivery and its components must be traceable back to sub-suppliers via suitable records and, where applicable, labelling of parts. In the event of deviation it must be ensured that the deviating quantity can be kept separate.

## 11. Standard and catalogue parts

The technical details listed in the standards and catalogues form the basis of the order and are therefore binding. The supplier commits himself to provide timely information in the event of changes. Contradictory details are to be clarified by the supplier prior to order confirmation.

## 12. Special processes and critical products

In the event of the supplier receiving an order from VEM that requires the use of special processes, he shall receive this information with the order. Special processes are to be controlled and monitored accordingly. This situation brings with it the following requirements:

For the company:
Technical equipment required for work processes must be present and documentation regarding this visible. The technical equipment is to be maintained by trained personnel and records kept of this.

For the staff:
The employees to be employed in these processes are to have verifiable training and qualifications for this. The respective documentation for these special processes is to be capable of being allocated to the manufacturing establishments and employees. Proof of welding qualification is to be provided to the responsible welding supervisor (WS) at VEM.

VEM has declared so-called critical products. If a supplier receives a job order for the supply of products deemed critical by VEM, he shall be notified of this fact in the corresponding order. The supplier shall identify and assess the manufacturing risks for his critical products in co-ordination with VEM. Additional risk minimisation measures are to be taken where necessary.

Suppliers of critical products are regularly audited and the deliveries subjected to stricter incoming goods inspections at VEM.

## 13. Control of documents and records

With the order the supplier receives the information regarding the scope of the documentation to be supplied. The supplier commits himself to control documents and drawings as per ISO 9001. This also applies for the awarding of job orders to sub-suppliers, where this is authorised by VEM. Such controlled documents include, for example, development plans, risk analyses, inspection or quality assurance plans, process descriptions, standard operating procedures, specifications, test documentation or drawings required for the parts that are to be supplied to VEM.

The supplier commits himself, unless otherwise specified in the order, to file these documents and drawings for at least 10 years from delivery of the last part, and to make these available to VEM on request.

Special forms or test records required for the documentation that is to be provided shall be made available by VEM. Where own documentation is used care must be taken to ensure that these documents satisfy the requirements described in the specifications (e.g. type of test record, document language, scope of documentation).

## 14. Confidentiality

The supplier and VEM commit themselves to maintain confidentiality to third parties regarding the content of agreements and contractual terms. Documents and information related to these Quality Guidelines are to be treated with confidentiality. The confidentiality clause also applies beyond the end of the contractual relationship. Sub-suppliers are to be included in this confidentiality.

## 15. Liability

Acknowledgment of these Quality Guidelines does not release the supplier from liability for claims for guarantee/warranty and compensation on the part of VEM as a consequence of material defects in supplies.

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# Notes


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