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Supplier Quality Management Directive

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Preface

Stadler Rail Service Deutschland GmbH (hereinafter referred to as "SRS DE") is a leading provider of maintenance and services for rail vehicles, in particular services for the maintenance, overhaul, repair and conversion of rail vehicles, including technical support as well as the purchase and sale of spare parts together with logistics services.

The high proportion of purchased semi-finished products, components and systems and their quality largely determines the quality of the services offered by SRS DE. It is therefore essential to continuously monitor and improve the quality, safety, durability, environmental compatibility and energy efficiency of our purchased parts in close cooperation with our suppliers. This Quality Management Directive describes the quality requirements for suppliers qualified by us and their products, and is valid for deliveries to all SRS DE sites.

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1. Introduction

The aim of this Quality Management Directive is to improve the quality and environmental compatibility of the purchased parts¹ supplied to SRS DE. SRS DE therefore expects its suppliers to implement the requirements listed in this Quality Management Directive.

Preliminary assessment and selection of suppliers

In order to establish a business relationship between SRS DE and a new supplier, a supplier and environmental questionnaire must be submitted to the responsible purchaser. The questionnaire is provided by the purchaser. A new supplier must meet the following minimum requirements:

- Acceptance and implementation of this Quality Management Directive,
- Implementation and maintenance of a functioning QM system at least according to DIN EN ISO 9001 as amended.

In addition, it is essential for SRS DE that suppliers continue to develop by working towards further certifications. These include:

- Demonstration of a functioning environmental management system, e.g.: DIN EN ISO 14001
- Demonstration of a functioning occupational health and safety management system, e.g.: DIN ISO 45001

SRS DE reserves the right to check the QM system and/or production at the supplier's place of business before approving the supplier. The verification takes place in the form of an audit at the supplier's place of business, whereby general system or process audits and possibly audits for specific processes can be carried out by auditors of Stadler Deutschland GmbH or SRS DE.

2. Area of application

This Quality Management Directive applies to all purchased parts that SRS DE orders/commissions from the supplier.

3. Supplier requirements

3.1 Quality management system

SRS DE expects its suppliers to implement the following requirements as a basis for trustworthy cooperation between suppliers and customers.

¹ Please note: The directive generally uses the term "purchased part". This includes all semifinished products, systems and components that are delivered to SRS DE by the supplier according to the purchase order.

Management systems

- The supplier must have a certified quality management system that meets at least the requirements of DIN EN ISO 9001 as amended.
- Furthermore, the supplier should work with a certified environmental management system in accordance with DIN EN ISO 14001. The requirements of national laws and DIN ISO 45001 (occupational safety) must be observed.

Environmental protection / packaging

- The supplier must meet the current legal requirements for packaging, transport and storage, as well as for ingredients and their current limits for products on the market.
- All environmental, electrical and electromagnetic specifications that exist in the country of manufacture and the country of use must be applied.
- The supply of hazardous materials must comply with national requirements regarding the labelling and transport of hazardous materials. Before delivery, the supplier must provide the safety data sheets to SRS DE.
- The supplier is obliged to comply with the requirements defined in the SRS DE Logistics Directive (status: 2021/01, available at www.stadlerrail.com/de/zulieferer) regarding packaging. However, in the event of inconsistencies between the Quality Management Directive and the Logistics Directive of SRS DE, the Quality Management Directive takes precedence.

Quality assurance

- The supplier should be familiar with the tools of preventive quality assurance, which are used for the early recognition of weak points in the design and production of the purchased part (e.g. FMEA, SPC).
- The specifications and standards listed on drawings, parts lists or orders are binding for the production of the purchased part. The SRS DE purchasing department must be notified of any discrepancies in delivery immediately in writing and these can only be accepted after written approval.
- The supplier undertakes to grant the auditors of SRS DE or Stadler Deutschland GmbH free access to their production facilities at any time with a notice period of 24 hours.
- The supplier undertakes to inform the SRS DE purchasing department immediately in writing in the event of withdrawal of certificates or other circumstances in their production facility which deviate from the previous standard.
- The supplier is responsible for the selection of their sub-suppliers. It is the responsibility of the supplier to ensure that the selected sub-suppliers also have a certified quality management system.

3.2 Advance quality planning

Advance quality planning is a structured method with standardised quality tools, which aims to ensure that all the process steps required for the production of the purchased part are completed on time before delivery and that the product meets customer expectations.

3.2.1 Manufacturing feasibility test

Technical documents (e.g. drawings, specifications, requirements catalogue) provided by the purchasing department or the engineering department of SRS DE are to be checked by the supplier. This review includes both an examination of the feasibility of the requested purchased

part and an examination of the manufacturing feasibility, both procedural and economical, given the requirements placed on the purchased part. To the benefit of both parties, the supplier is requested to provide their experience and suggestions for optimising the purchased part in the course of the manufacturing feasibility test.

The result of the manufacturing feasibility test must be presented to the SRS DE purchaser in the completed “Declaration of Manufacturing Feasibility” form before the order is initiated and must be carried out again or updated in the event of changes to the design and/or production. The declaration of manufacturing feasibility shall be submitted with the first article inspection.

3.2.2 Failure Mode and Effect Analysis (FMEA)

The implementation of an FMEA serves the purpose of preventive quality assurance, in order to be able to identify possible weak points in the purchased part early in the design phase (Design FMEA) and the production phase (Process FMEA) before delivery. This kind of analysis is absolutely necessary for those components which, if they were to fail, would give rise to a direct or indirect danger to persons and/or an operational danger for the railway vehicle. On request, the supplier shall provide SRS DE with a Process FMEA within a period of 4 weeks for presentation and inspection.

3.2.3 Process flow chart

For a common understanding of the process steps involved in the production of purchased parts, it is helpful for the supplier to create a process flow chart that shows all individual production and test steps. The process flow chart contains a list of all:

- Production steps
- Test steps
- Production parameters
- Machines/systems, tools, equipment

The process flow chart can be requested by SRS DE during the first article inspection and must be made available by the supplier within a period of 2 weeks.

3.2.4 Test plan

An essential result of the advance quality planning is the preparation of test plans, which are intended to ensure the quality of the produced purchased parts. A test plan contains information on all tests in the manufacturing process of the purchased part, which are carried out alongside production and before delivery by the supplier. Test plans are an integral part of the first article inspection and are to be submitted by the supplier to SRS DE for inspection at any time upon request; selected tests can be presented upon request as part of the first article inspection.

The test plans contain the following features for each process step:

- Description of the characteristic to be tested
- Test methods
- Testing equipment
- Sample size
- Sampling frequency
- Documentation of test results

- Qualification

If necessary, the supplier must take independent measures to ensure quality that go beyond the test plan.

3.2.5 Monitoring of test and measuring equipment

Monitoring of test equipment is a central requirement of ISO 9001 and requires regular calibration and/or standard-compliant inspection of all test and measuring equipment of a company. It is assumed that the supplier uses test and measuring equipment which is sufficiently accurate, reliable and traceable at all times in accordance with its area of application.

3.2.6 Packing regulation

The supplier is responsible for the packaging of their produced parts. This must ensure that the purchased part cannot be damaged or soiled by external influences during transport.

The supplier is obliged to comply with the defined requirements in the SRS DE Logistics Directive (status: 2021/01, available at www.stadlerrail.com/de/zulieferer) regarding packaging. This directive is used to plan and implement logistical purchasing, procurement and quality processes. Suggestions by the supplier for alternative packaging deviating from the Logistics Directive must be agreed with the responsible purchaser of SRS DE in good time before the start of the series deliveries.

All purchased parts which may be adversely affected through interaction with their environment in terms of their function and/or appearance must be preserved in a suitable manner. On the supplier's initiative, the planned type of preservation (if necessary) must be agreed with the responsible purchaser of SRS DE in good time before the start of the series deliveries.

3.3 First article inspection

The production process and product approval for the purchased parts defined in advance with the supplier is performed by checking the first parts which have been produced and tested by the supplier under series conditions (machines, systems, operating and test equipment, processing conditions). These so-called first articles are taken during the first article inspection (FAI) at the supplier's place of business by employees of the SRS DE supplier quality assurance team.

In order to carry out a first article inspection, the following conditions must be met:

- Initial production of a new purchased part (new article number)
- Product change of a previously approved purchased part (e.g. material change)
- Relocation of production
- Change to the manufacturing process
- Restart of production (e.g. for option projects) after a period greater than 24 months
- New supplier
- Customer specification
- SRS DE requirement

A first article inspection must be carried out in the schedule at least 2 weeks before the delivery date agreed with the purchaser, so that reworking, changes or additional tests arising from the first article inspection can be carried out in good time by the supplier before delivery of the purchased parts.

The respective scope of the first article inspection must be agreed in advance with the responsible supplier quality assurance employee. To this end, the supplier is provided with a checklist that shows the scope of the tests and documents, the results of which are to be submitted for review or handover at the time of the first article inspection.

For the documentation of the first article inspection, the SRS DE template should preferably be used, but alternatively the use of a corresponding form from the supplier is also possible. In general, however, the results of all agreed quality tests according to the SRS DE checklist with predefined target and determined actual values are to be documented in the first article inspection report and made available by the supplier at the first article inspection date.

The result of the verification of the first articles and documentation shall be recorded on the cover page of the first article test documentation by an SRS DE supplier quality assurance employee as follows:

- Approved
- Conditionally approved
- Rejected, re-sampling required.

At the date of the first article inspection, the agreed requirements with dates for completion must be documented in the first article inspection report. The supplier is obliged to process the conditions in accordance with the deadline in consultation with the SRS DE supplier quality assurance employee and to hand over the proof of implementation. Any contested characteristics of purchased parts must be corrected by the supplier prior to delivery to SRS DE.

If the first articles are rejected, new first articles must be presented to the SRS DE supplier quality assurance employee at a subsequent inspection date. Delivery approval is only granted if subsequent sampling is successful.

The approval of the first articles does not relieve the supplier of responsibility for the quality of their products in series production. With the issue of an approval as part of the first article inspection, SRS DE accepts no responsibility for defects to purchased parts that were not recognised at the first article inspection date.

3.4 Control of defective products and corrective measures

3.4.1 General requirements

The supplier must maintain a system for controlling defective products in accordance with DIN EN ISO 9001. The test status of the products shall be identifiable at all stages of manufacture.

If the supplier finds during their tests that defective products have been produced, the production process must be stopped immediately and corrected. The defective parts shall be physically marked and clearly separated from defect-free parts stored in the supplier's warehouse. In this case, 100% of pending deliveries must also be checked for the corresponding defect prior to delivery. If the internal supplier inspection reveals that defective products may already have been delivered to SRS DE, the responsible SRS DE purchaser

must be informed of the defect immediately in writing. Corrective measures initiated by the supplier must be communicated in writing in the form of an 8D report or action plan.

If purchased parts which do not conform to the drawing are found in the goods-in or assembly department and can be attributed to a supplier error, the supplier concerned shall be informed of the defect by way of a notice of defect. The further treatment of the parts to supply the production process with defect-free components is agreed with the supplier, whereby the following actions are possible:

- The immediate rejection of the entire delivery to the supplier,
- Sorting and/or reworking by the supplier,
- Sorting and/or reworking, 100% inspection by SRS DE employees or by a subcontractor at the supplier's expense,
- Conditional delivery – one-off special approval.

SRS DE reserves the right to pass on to the responsible supplier any costs associated with the rectification of defects by the supplier's delivering defective parts.

3.4.2 8D report

All special measures implemented by the supplier to supply SRS DE with purchased parts in conformity with the drawing must be notified to the purchaser in writing by means of an 8D report within 14 days. For questions about the content of an 8D report, quality management staff at SRS DE are available as contact persons.

SRS DE reserves the right to check the content of the 8D report for plausibility and to reject the measures taken by the supplier to eliminate the error as insufficient. In this case, the supplier must revise the 8D report.

3.4.3 Special approvals

In exceptional cases, the supplier's requests for special approvals of deliveries with deviations from the drawing or specification can be approved by SRS DE. The template for such a tolerance request shall be made available on request by the responsible purchaser. The tolerance request must be submitted in writing to the purchasing department and is checked by the SRS DE engineering department. The supplier is not entitled to approval. An approval of the delivery shall be indicated to the goods-in department at SRS DE by marking the goods by means of an enclosed copy of the approved tolerance request.

The form of the special approval is time-limited and applies to a limited time or a limited number of purchased parts and is not an unlimited approval for subsequent deliveries. Permanent approval of the requested deviation can only be determined in coordination with the SRS DE engineering department. In this case, the changes shall be recorded in the design documentation (drawing, specifications, parts lists). In the event of infringements, SRS DE reserves the right to charge the supplier for all costs associated with eliminating defects resulting from the delivery of purchased parts without tolerated deviations.

3.5 Indication of changes

Along with the order, the supplier receives from the SRS DE purchasing department all the necessary design documents in the form of drawings, specifications and parts lists, which are

necessary for the manufacture of the purchased part in accordance with the drawing. Specified DIN, EN and ISO standards represent the current state of the art, whereby the supplier is responsible for the procurement of the respectively valid standards.

If the supplier wishes to make changes to the design documentation, the changes to the purchased parts or in the manufacturing process must be notified in writing and agreed with the responsible purchaser. A change to purchased parts and/or manufacturing processes requires the written approval of SRS DE.

In the event of infringements, SRS DE reserves the right to charge the supplier for all costs associated with eliminating defects resulting from the delivery of changed purchased parts without approval.

If purchased parts have already undergone the first article inspection, the SRS DE purchasing department will clarify with the supplier to what extent subsequent inspection is necessary.

The supplier undertakes to keep all documents required for the production of the purchased part up-to-date and always keep the current production documents with the latest change index available in the production by distribution. The supplier is obliged to agree with the SRS DE purchasing department when the purchased parts manufactured according to the new change index will be delivered.

3.6 Control of documents and quality records

3.6.1 Retention periods

The supplier shall specify appropriate retention periods for quality-related documents and records. The following minimum requirements must be met by the supplier:

30 years for:

- Design documentation and test records of the purchased parts delivered to SRS DE
- Records of special tests (e.g. type test documents, fire safety tests)

The retention periods apply from the date of delivery of the last purchased part of the respective order. These stipulations do not replace any statutory or other individual contractual claims. In special cases of customer demands, different retention periods may apply.

All quality records shall be legible and adequately protected against damage or loss. The supplier shall provide SRS DE with access to these documents (including during an audit by SRS DE) upon request (while respecting the supplier's manufacturing and business secrets).

3.6.2 Test certificates

The order or accompanying specification indicates whether an acceptance test certificate 3.1 in accordance with DIN EN 10204 with delivery of the purchased parts is to be handed over to SRS DE. By handing over an acceptance test certificate 3.1, the supplier confirms that the delivered products meet the requirements of the order documents (drawing, parts list, specification) with indication of test results based on specified tests.

The scope of the documentation of the test results on the acceptance test certificate 3.1 must be coordinated with the relevant SRS DE supplier quality assurance employee as part of the

first article inspection. In addition, the test certificate must document the item number as stated in the purchase order and, if available, the serial or batch number of the purchased parts delivered for identification purposes.

The acceptance test certificate 3.1 must arrive simultaneously with the goods and the delivery documents in the SRS DE goods-in department and be sent in parallel to the email address specified in the purchase order. In agreement with the SRS DE purchasing department, test certificates can also be archived at the supplier's place of business, whereby these must be made available electronically or by fax on request.

3.6.3 Fire prevention certificates

The order or specification lists the requirements for flammability and toxicity class in accordance with DIN 5510 or DIN EN 45545 for purchased parts subject to proof. In submitting the quote, the supplier is obliged to check whether the requirements for fire protection can be met by the supplier for the purchased part to be delivered and whether there is appropriate evidence of fire test results. Care must be taken to ensure that the test certificates presented are not older than 3 years (DIN 5510-2) or 5 years (EN 45545-2) when vehicle parts requiring proof are delivered.

If no evidence of fire prevention tests carried out is available at the supplier's place of business, or only evidence which is no longer valid, the tests by the supplier must be commissioned by accredited fire prevention laboratories in accordance with EN 17025. The current standards and regulations must be applied for the fire testing of a purchased part that is subject to proof.

The results of the fire tests must be transmitted to the email address specified in the order at least 2 weeks before the start of delivery, so that a check of the documents is still possible in good time. The lack of fire prevention certificates or the failure to release the handed-over evidence can lead to a delivery ban during the first article inspection.

3.6.4 Evidence of conformity

Manufacturer's obligations, evidence of conformity and technical documentation are governed by the country-specific laws on product safety and product liability as well as the relevant regulations contained in all other applicable legal bases. These laws, guidelines and regulations must be fully observed by the supplier at all times.

3.7 Requirement for components with welded joints

Suppliers that weld purchased parts for railway vehicles and supply them to SRS DE must provide evidence of a valid welding certificate in accordance with DIN EN 15085-2. The manufacturer certificate must include the certification level stipulated on the welding drawing in accordance with DIN EN 15085-2 (CL1-CL3) with the required scope. Commissioning a sub-supplier to produce welded parts that require certification will not release the contractor from the obligation to ensure that the contractor and sub-supplier are in possession of the welding certification required in accordance with DIN EN 15085-2. Furthermore, note that SRS DE must be notified in writing without being asked and if subcontractors are commissioned to produce welded parts with certification level CL1 or CL2 in accordance with DIN EN 15085-2 and Stadler must grant approval in writing.

SRS DE is obligated to inspect new welding facilities before awarding the contract. For this purpose, a process audit will be carried out by SRS DE to check the technical welding requirements in accordance with DIN EN 15085 and DVS 1617. SRS DE reserves the right to re-audit series suppliers that have already been approved by Stadler for the following reasons:

- Assignment of a new welded part with CL1 classification
- Quality issues with a welded part in assembly or in the field
- Change of employees and/or changes to the welding process

The delivery of welded parts that require verification is not permitted without proof of the manufacturing facility certification stipulated in the drawing / purchase order. The suppliers must keep the welding certificate of their facility up to date and must send the current certificates to the purchaser without being prompted. In the event of infringements, SRS DE reserves the right to charge the supplier for all costs associated with eliminating defects resulting from deliveries of purchased parts without valid certificates.

Verification of the supplier's certificates is also part of the first article inspection. A missing or expired certificate will result in a delivery block for the ordered purchased part and the supplier will be excluded from further orders for purchased parts with the same certification requirements.

3.8 Requirements for components with bonded joints

Suppliers who deliver purchased parts with bonded joints to SRS DE must meet the requirements of DIN 6701 parts 1 to 4 and demonstrate the adhesive bonding certificate for the adhesive class shown in the drawing (A1 to A3) as per DIN 6701-3. Proof will be deemed to be provided if the supplier sends the valid certificate as per DIN 6701, which is required for bonding the purchased part, to the purchaser. In this connection, it is pointed out that suppliers who perform simple bonding and sealing work of class A3 in accordance with DIN 6701-3 also require an adhesive bonding approval.

If sub-suppliers are commissioned by the supplier with the production of bonding parts that require verification, this shall not release the supplier from the obligation to ensure that the supplier and sub-supplier are in possession of the adhesive bonding approval required in accordance with DIN 6701-3. Furthermore, it should be noted that SRS DE is to be notified in writing without being asked of the assignment of bonding work for purchased parts of class A1 or A2 according to DIN 6701-3 to sub-suppliers and that this must be approved by SRS DE.

SRS DE is obligated to check new specialist bonding companies before placing an order for purchased parts with A1 bonding. For this purpose, a process audit will be carried out by SRS DE to check the technical adhesive bonding requirements in accordance with DIN 6701. At the discretion of SRS DE, specialist bonding companies that have already been approved can be audited again for the following reasons:

- The assignment of a new bonding part with A1 classification
- Quality issues with bonded joints on a serial part in assembly or in the field
- Change of employees and/or changes to the bonding process

The delivery of components with A1 or A2 classification that require verification is not permitted without proof that the production facility has the necessary adhesive bonding certification. The suppliers are called upon to keep the adhesive bonding certificate of their production facility up to date and to send the current certificates to the purchaser without being prompted. In the

event of infringements, SRS DE reserves the right to charge the supplier for all costs associated with eliminating defects resulting from deliveries of purchased parts without valid certificates.

Verification of the supplier's certificates is also part of the first article inspection. A missing or expired certificate will result in a delivery block for bonded components with A1 or A2 classification and the supplier will be excluded from further orders for bonded components with the same classification.

The durability of a bonded joint is tested in accordance with DIN 6701 through an adhesion test. In the case of painted components, the adhesion test must also be carried out on painted surfaces to ensure that the bonded joint is not weakened by paint peeling. The results of adhesion tests alongside series production of components with A1 or A2 classification must be presented to SRS DE's adhesion supervisor.

3.9 Requirements for components with paint

3.9.1 Principles

On the part of SRS DE, a project-specific painting specification of lacquers and colours is created for each vehicle project, the name of which is shown in the parts list or drawing for the purchased part to be painted. The specification of lacquers and colours specifies all requirements for the required paint systems with instructions for the preparation of components and the performance or testing of the painting, which are binding for the supplier in addition to the technical standards and guidelines. On the other hand, information on the desired shade of the paint can be found in the drawing of the component to be painted.

Coating materials in accordance with the agreed specification must be used for painting. Deviations from this requirement must be agreed with the purchaser and approved. In addition, a tested repair concept for miniscule damage must be submitted for conversion to powder coating. The coating materials must be processed in accordance with the processing instructions of the paint manufacturers. Technical information sheets, safety data sheets, etc. must be made available to the supplier by the paint manufacturer for delivery. When coating materials are ordered, the paint manufacturer must always be informed that SRS DE is the end customer and of the project including project number. If the paint business has never processed the required coating materials before and/or is uncertain about how to handle them, an appointment should be made with the paint manufacturer's application technology department.

The specifications listed in the specification of lacquers and colours do not relieve the supplier of the responsibility to ensure the identity and quality of the coating materials used by means of appropriate tests, since the supplier is responsible for the quality of the painting result.

3.9.2 Tests

The tests necessary for monitoring and ensuring the coating quality of a painted purchased part are listed in the agreed project-specific specification of lacquers and colours and the test procedures are described with reference to the referenced testing standards.

One painted purchased part per delivery batch must be fully tested. For the first delivery, all purchased parts of the delivery must be tested non-destructively, whereas destructive tests

can be carried out on auxiliary objects such as sample plates. The supplier shall keep records of the test results for documentation purposes.

For the approval of the processed paint system during coating operation, the supplier must produce at least three boundary sample plates of size DIN A4 for colour tone, structure, gloss level, layer thickness and layer structure, as well as surface preparation (in particular adhesion properties) and, if appropriate, further properties. From this batch, two boundary sample plates are to be handed over to the purchaser as proof of performance for approval; one plate remains with the supplier as a retain sample. Information on the colour structure must be taken from the project-specific paint specification. After the two plates have been examined by SRS DE in cooperation with the supplier quality assurance of Stadler Deutschland GmbH, a written approval with indication of the decision (approved, conditionally approved, rejected) is sent to the supplier via email. The two sample plates remain in the ownership of SRS DE and Stadler Deutschland GmbH as retain samples.

For the testing of the paint system, information on the coating material and tests of the paint system by the supplier are required. These must also be documented by way of a stipulated sticker affixed to the back of the sample plates. Detailed contents for the sticker can also be found in the project-specific paint specification.

If a first article inspection is required for the purchased part, the test of the sample plates must have been carried out before the first article inspection date, since the Stadler approval for the paint system must be submitted as part of the first article inspection documentation. A lack of paint approval and/or the absence of test records for paint coating on the first sample will lead to a delivery stop. Otherwise, the colour sample approval must be secured as quickly as possible before the delivery date for the purchased parts.

After approval, any changes to the paint structure and painting process are only permitted after consultation with the SRS DE surface engineer. This also includes changes of supplier. Particular caution is required, since certain purchased parts are also incorporated into safety-relevant system bonds.

3.10 Requirements for glass products

In addition to the legal requirements, SRS DE component specifications, which are also specified on the purchase order, may apply. This document, which also applies, regulates the component-specific requirements such as dimensions, screen printing, glass colour, glass structure, company logo and test stamp, as well as the scope of the type tests on the glass product.

In addition to the delivery note, an acceptance test certificate 3.1 in accordance with DIN EN 10204 must always be included for delivery.

3.11 Requirements for electrical components

The quality of an electrical or electromechanical component is essentially guaranteed by compliance with the SRS DE design specifications, including:

- Earthing instructions PA_1354887

- Selection of the electrical plug connection based on the SRS DE specifications in the enquiry to the supplier
- 100% compatibility with the interface (hardware and software) in the vehicle specified in the enquiry to the supplier
- Consideration of the specifications of the SRS DE engineering department with regard to connection to the vehicle BUS or network with regard to data transmission and data security in the enquiry to the supplier

Proof of the functionality of the ordered components is ensured by suitable tests, which the supplier must carry out on the basis of the current standards, regulations and component specifications from the enquiry to the supplier within the scope of type tests.

The following standards serve as the basis for the design of the electrical components and shall be taken into account in the type tests:

- DIN EN 50 155 Electronic equipment on railway vehicles
- DIN EN 50 121-3 Electro-magnetic compatibility
- DIN EN 50 125-1 Environmental conditions for equipment on railway vehicles
- DIN EN 50 124 Insulation coordination
- DIN EN 50 153 Protective provisions relating to electrical hazards
- DIN EN 60 077-1 Electric equipment on railway vehicles
- DIN EN 60 529 Degrees of protection provided by enclosures

In addition, the following evidence shall be provided:

- Evidence of conformity of the component (manufacturer's document)
- Proof of performance for component tests required by Stadler component specifications

3.12 Requirements for connecting elements and screw connections

According to the purchase order, special requirements are placed on screws/nuts with a verification according to DIN EN 10204, in that the results of the tests for the verification of the required strength properties and the corrosion resistance by the manufacturer must be confirmed on the 3.1 acceptance test certificate. These include:

- Screws and nuts from strength class 10.9 and above made of heat-treated steel
- Screws and nuts from strength class 8.8 and above with thread $M \geq 16$ made of heat-treated steel
- Stainless and corrosion resistant stainless steel screws and nuts with thread $M \geq 10$

Following the railway standards for screw connections (e.g. DIN 25200, DIN 25201, DIN 25203), the fastening guideline PA_1222166 was drawn up by SRS DE. This describes the requirements for the various fastening systems in railway vehicles. This is to ensure that the purchased parts developed by suppliers are also assembled with standard and uniform fastening systems. The fastening guideline PA_1222166 is therefore binding for the design and assembly of screw connections in purchased parts in addition to the known standards and regulations and also applies in the first article inspection of purchased parts with screw connections.

3.13 Customer-specific requirements

In addition to the quality requirements described here, other customer-specific or project-specific requirements can exist (e.g. the Deutsche Bahn AG rules), which, however, are communicated only when necessary and coordinated with the supplier.

4. Forms

The documents listed below are SRS DE quality documents, which are mentioned as templates in individual sections of this Quality Management Directive.

- Supplier self-disclosure
- Manufacturing feasibility analysis
- Tolerance request
- Paint sample board

The original forms in Word or Excel format may be made available to the supplier as working documents on request via the purchasing or supplier quality assurance departments.