PROCEDURAL INSTRUCTION

4.02.VA.0002 INITIAL SAMPLE INSPECTION SUPPLIER

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CONTENTS

1 AIM AND PURPOSE

This procedural instruction (VA) describes the framework for the execution and documentation of the first article inspection (FAI) between Rheinmetall Electronics GmbH (RME) and the supplier of a product.

1.1 LIST OF ABBREVIATIONS

Abbreviation	Explanation
CDR	Critical Design Review
CID	Configuration Identification Document
CoC	Certificate of Compliance
EMP	First article inspection, synonymous with FAI
FAI	First Article Inspection
FAIR	FAI Report
IST-LU	LU with details of the parts actually installed
KID	Configuration identification document
KMP	Configuration management plan
LU	List of parts requiring monitoring
PDR	Preliminary Design Review
PQM	Project Quality Manager
PRR	Production Readiness Review
RME	Rheinmetall Electronics GmbH
SCM	Supply Chain Manager
TARGET-LU	LU with indication of the permissible parts
UAN	Subcontractor (2nd tier supplier)
VA	Procedural instruction
VDD	Version Description Document

2 GENERAL INFORMATION

The process instruction describes the implementation of the initial sample inspection at suppliers in addition to RME process *4.02.P.0005 Initial sample inspection*.

2.1 DEFINITIONS

Design features	Dimensional, visual, functional, material and mechanical specifications or characteristics that describe and constitute the design of the product according to the requirements specified in the drawings or the DPD. These characteristics can be measured, checked, tested or verified to prove compliance with the design requirements. Dimensional data includes positional data for the manufacturing process (e.g. nominal machining or forging/casting dimensions for forgings and castings, and for the preparation of welded/soldered joints required for acceptance of the finished joint). Material specifications or properties may include machining parameters and sequences specified in the drawing or DPD (e.g. heat treatment temperature, class of fluorescent penetrants, ultrasonic testing, sequence of welds and heat treatments). These ensure the intended characteristics that cannot be specified otherwise.
digital product definition requirements (DPD)	Requirements of any digital files that describe the physical or functional requirements, directly or by reference, including files that describe the design and acceptance criteria of the product Examples of a DPD include the following: • the digital definition and two-dimensional (2D) drawing sheets with complete dimensions; • a three-dimensional (3D) data model and simplified or reduced 2D drawing sheets • the 3D model with design features specified in text form; • all other files that define a product in its entirety.
Initial sample	Initial samples are products (systems, assemblies or individual parts) that have been manufactured with the tools and processes intended for series production under series conditions before the start of series production.
First article inspection (FAI)	Planned, complete, independent and documented testing and verification process to ensure that the prescribed production processes have been used to manufacture a product in accordance with engineering drawings, DPD, planning, order, technical specifications and/or other applicable design document. The English abbreviation FAI is used throughout the process and the associated documents.
First Article Inspection Report (FAIR)	Forms and document set for a part number, sub-assembly or assembly, including the associated initial sample inspection results.
IST-LU	Serial numbers for internally manufactured parts of a product are assigned by the person responsible for integration. In the case of external deliveries, the supplier must provide the actual LU for its part (see *7.02.PB.0005*).

critical unit	Unit (e.g. function, part, software, feature, process) that has a significant impact on product realization and use, including aspects such as safety, performance, form, fit, function, manufacturability, life, etc., and that requires specific actions to ensure that it is adequately addressed. Examples include safety critical units, fracture critical units, mission critical units, key features, and safety critical maintenance tasks.
Key feature	a feature or characteristic whose change(s) has a significant impact on the fit, performance, durability or manufacturability of a product and requires specific measures to control changes (see 9100 and 9110)
Product	Any intended result of a product realization process, including, within the scope of this European Standard, finished components, sub-assemblies, assemblies, forgings and castings.
Qualified tools	Universal (non-part specific) calibrated monitoring and measuring equipment, (e.g. good/bad gauges, thread gauges, radius gauges) used to validate product design characteristics that are clearly specified and traceable from calibration records.
TARGET-LU	All parts to be monitored in a scope of delivery (i.e. with manufacturer part identifier, serial number and construction status) are summarized in the list of monitored parts (target LU). In the case of external deliveries, the supplier must provide the target LU for its share (see 4*.03.PB.0006*).
Special tools	Product-specific tool [e.g. test fixtures, coordinate measuring machine (CMM) program] specifically manufactured to validate the design characteristics of a product.

2.2 RESPONSIBILITY

The supplier is responsible for the correct execution and accuracy of the initial sample inspection. In the case of subcontracting by the supplier, the supplier is responsible for passing on and fulfilling the quality requirements. This includes the proper documentation of the initial sample inspection and the preparation of the initial sample inspection report.

RME Project Purchasing is responsible for contractually agreeing the RME quality requirements with the supplier and commissioning the FAIs as specified by the Project Quality Manager.

The Project Quality Manager (PQM) determines which material requires an FAI and defines its quality requirements. It is also the PQM's responsibility to decide whether an FAI has been carried out successfully and whether series production can be released.

Furthermore, it is the responsibility of the PQM to determine whether an initial sample test part can be used as series material, or whether it is stored as a retained sample or used as the last part of a series (consumption of the retained sample).

2.3 REASON FOR THE INITIAL SAMPLE INSPECTION

As part of the inspection planning, it is determined for which material an initial sample inspection (FAI) is required. The FAI must be carried out before the start of series production/start of the first series batch. In the event of longer interruptions to production and changes to the product or production process that are significant in nature, the initial sample inspection must be repeated in full or in part. Significant is the loss or

replacement of previously acquired knowledge or other factors important for a qualitative product. An FAI that has already been carried out must be repeated under the following conditions:

- **Change of equipment**
  This applies, for example, to new purchases and relocations of tools, devices, production machines, measuring/testing equipment, gauges, data carriers within the approved (sampled) production site. However, it is only necessary to repeat the FAI if validated production or test equipment is affected by the change.
- **Design changes**
  This applies, for example, to changes to standards, materials and approved documents.
- **Process changes**
  This concerns, for example, production planning, production processes, process data including tests and test procedures.
- **Personnel changes**
  This applies to significant changes in personnel who carry out production, processing, assembly and testing work and who are entrusted with the supervision or management of this work. If the qualifications are the same or higher, the change in personnel does not have to be reported.
- **Changes to the production location**
  This concerns changes to the approved/released production location.
- **Change of supplier**
  This includes a change of supplier for vendor parts as well as changes at the RME supplier's sub-supplier that affect individual production steps as defined in this section.
- **Interruption of production**
  After an interruption in production of more than 12 months.

The supplier is obliged to inform RME's Purchasing and Quality Assurance departments in writing in good time if one or more factors occur.

3 PROCEDURE OF THE INITIAL SAMPLE INSPECTION

The initial sample inspection can be carried out within the following organizational framework:

- Carrying out the initial sampling including the assessment of the production process.
- Carrying out initial sampling without assessing the production process.
- Initial sample inspection on a document basis without assessment of the production process and without assessment of the initial sample.

The decision on the organizational framework must be determined by the PQM prior to procurement and communicated to the supplier in writing.

3.1 CONDUCTING THE FAI PRELIMINARY MEETING WITH THE SUPPLIER

Before the initial sampling is actually carried out, the requirements (section 3.2) and the content of the FAI must be agreed with the supplier. The PQM contacts the supplier for this purpose as soon as the FAI has been commissioned. In the preliminary meeting, the PQM and the supplier define the framework conditions for the initial sample inspection and its content. The basis for the coordination are the identified product-specific

characteristics as well as the special production processes and functional tests. The test certificates and/or certificates of conformity must then be requested accordingly by the supplier and checked as part of the FAI. The following topics must be agreed with the supplier in the preliminary meeting and specified on form *4.02.F.0024 FAI preliminary meeting*:

- Object of the FAI (exact product designation, material number, state of construction, order, status of drawing set)
- Reason and type of initial sampling (complete or partial, e.g. for re-sampling)
- Necessity of an assessment of the production site
- Number, labeling and subsequent use of initial samples
- Place of assessment of the initial samples
- Language of the verification documents
- FAI date
- Specifications for communication (communication matrix)
- Requirements for the implementation of the FAI that are not met at the time of the preliminary meeting
- Product-specific features and their verification
- Special production processes and/or functional tests and their verification
- Proof of the configuration of the initial sample

If the supplier indicates technical change requests, these must be communicated to Purchasing and requested by means of an official change request. The communication matrix must be adhered to.

In cases where a large number of similar products are to undergo initial sampling at the supplier, agreements can be made that certain certificates are valid for several FAIs. The contents of this agreement must be recorded (see template *4.02.F.0024 FAI preliminary meeting*) and signed by both parties. The minutes are part of the subsequent FAI scope and a prerequisite for the initial sample inspection.

3.2 ENTRY REQUIREMENTS FOR AN INITIAL SAMPLE INSPECTION

The implementation of the initial sample inspection is linked to certain entry requirements, which are agreed between the project and the supplier. However, the following minimum requirements must be met before the FAI can be carried out:

- Contract or assignment for the FAI exists,
- Drawing sets and all material requirements are approved,
- Specification with all necessary requirements has been released (for development orders),
- If required (for development orders): RME approval of the design (PDR, CDR),
- If required: Verification is complete,
- If required: Qualification has been completed,
- Production documents are released,

- All verification documents (REACH, RoHs, Safety Statement etc.) required in the contract or the order are available,
- The first sample was built,
- Internal PRR of the supplier has been completed and passed (production control plan, test planning, PAs are available)
- FAI preliminary meeting has taken place and has been signed off by the supplier

The PQM checks whether the entry requirements for the product in question have been met (if applicable) and, if necessary, has the project submit the relevant evidence (e.g. contract, commissioning, qualification certificates already submitted, etc.). All necessary requirements for the FAI that are not fulfilled at the time of the preliminary meeting with the supplier must be named by the PQM in the preliminary meeting and noted as a necessary requirement on form *4.02.F.0024 FAI preliminary meeting.* The FAI can only be carried out once all entry requirements have been met.

The supplier shall notify the PQM of readiness for the initial sample inspection and provide all necessary evidence at least 2 weeks (10 working days) before the inspection is carried out. The PQM shall ensure that all requirements are met and that the evidence provided has been accepted by the technical department.

If changes occur or new findings arise for the FAI, it may be necessary to repeat the preliminary meeting and redefine the requirements. In this case, a new report must be prepared in accordance with template *4.02.F.0024 FAI preliminary meeting*, which replaces the old report.

3.3 CARRYING OUT THE INITIAL SAMPLE INSPECTION

The supplier is responsible for fulfilling the entry requirements for the initial sample inspection and submits all required evidence to the PQM at least 2 weeks (10 working days) before the FAI is carried out. As soon as the PQM has checked and accepted the evidence together with the technical department (e.g. design engineer), he/she informs the supplier that the actual initial sample inspection can begin.

The FAI is based on the contents agreed with the supplier in the preliminary meeting. The supplier is responsible for carrying out and documenting the initial sample inspection. To simplify the verification process, the supplier notes the RME specifications used (drawings, specifications, etc.) in the initial sample inspection report as well as the corresponding reference of the verification (system number + page number) for each requirement and sends the pre-filled initial sample inspection report together with the verifications to the PQM. The PQM checks whether all requirements have been taken into account (in accordance with the specifications from the preliminary meeting) and whether the RME specifications used correspond to the currently valid status in SAP. If necessary, the PQM participates in the FAI at the supplier's premises together with representatives of the technical department (e.g. design engineer).

If essential production processes are subcontracted or critical components are supplied, the subcontractors (name, address, identification if available) must be documented in the initial sample test report. The required evidence (see specifications in the preliminary meeting) of the subcontracted services or deliveries must be requested by the supplier from the subcontractor and submitted to the FAI. All subcontractors and suppliers as well as the subcontracted parts or work processes must be listed in the initial sample test report with the status of the respective evidence.

If intermediate tests are carried out during the production of the initial sample, which cannot be repeated or covered by comparable tests during the final acceptance of the initial sample, the proof of initial sampling must be submitted, which proves that these tests were carried out by qualified personnel and with verified or calibrated measuring and testing equipment. If necessary, the test certificates for delivered parts (e.g. X-ray inspections of cast parts or test reports for electronic assemblies) must also be submitted.

The PQM summarizes the evaluation of the initial sample inspection on the cover sheet of the initial sample inspection report (see template *4.02.F.0026 Initial sample inspection report*). After the PQM has completed the evaluation and made a decision on series release, the initial sample inspection report is signed by the supplier, the PQM and a representative of the technical department.

3.3.1 VERIFICATION OF THE REQUIRED EVIDENCE (FAI ON A DOCUMENT BASIS)

For each initial sample inspection, complete proof of all product-specific characteristics for the respective initial sample from series production must be provided. This also includes verification and qualification certificates, as well as declarations of conformity, RoHS certificates or REACH declarations. Furthermore, an initial sample must be produced for each FAI under series production conditions, which is assessed by the PQM and, if necessary, by the technical department. In particular, the visual appearance, possible damage (e.g. due to incorrect packaging or transportation) and the correct type plate must be checked. The PQM also checks whether the configuration of the initial sample matches the target specifications (e.g. parts list) from the order. If there are discrepancies between the order and the valid material specifications in SAP, this must be clarified with Project Purchasing. If necessary, the PQM also checks whether the certificates for special production processes and functional tests are available and valid. The exact requirements are defined individually for each material in advance.

3.3.1.1 PRODUCT-SPECIFIC FEATURES

The PQM checks the proof of conformity (e.g. test protocol, test certificate, etc.) for completeness and correctness for each characteristic defined in the preliminary discussion. In the case of more complex test protocols or qualification certificates, the relevant specialist department (e.g. design engineer or safety manager) should support the inspection. The supplier must be able to prove that he or his sub-supplier has fulfilled all product-specific characteristics in accordance with the RME specification. The point is only accepted by the PQM once all evidence has been provided.

3.3.1.2 SPECIAL PRODUCTION PROCESSES AND FUNCTIONAL TESTS

Similar to the product-specific characteristics, the PQM checks the evidence of the previously defined special production processes and functional tests. The supplier is obliged to provide evidence of the suitability and capability of the production and testing processes. If available, the RME specifications must be taken into account. The type of verification is determined with the PQM in the preliminary discussion. Only when all verification documents are available and have been accepted by the PQM is the point considered fulfilled.

3.3.1.3 COORDINATION OF THE TEST CERTIFICATE FOR SERIES DELIVERY

The definition of the certificate type for the series outbound delivery is derived from the definition in the material master in SAP. If the material has not been entered in SAP, the PQM determines which certificate is required for the outbound delivery.

The supplier issues a certificate of verification with the initial sample and submits it together with the FAI documents. The PQM checks whether the certificate meets the requirements of the underlying standard. Particularly in the case of the acceptance test certificate in accordance with DIN EN 10204 3.1/3.2, it must be ensured that the supplier is aware of the specific tests and test characteristics that are to be verified in the certificate with each delivery. If necessary, this can be agreed in advance with the technical department.

If the test certificate meets the requirements, the PQM notes on the FAI cover sheet that the test certificate has been approved.

Note:

The inspection certificate is defined during the inspection planning workshop (see *4.02.P.0003*). Changes to certificate types can be made via transaction MM02 in the Quality Management tab in plant 4010 (Purchasing).

If a COC has been selected in the material master without further information on the content, the requirements of DIN EN ISO/IEC 17050 must be applied.

3.3.1.4 APPEARANCE OF INITIAL SAMPLE

The appearance of the initial sample must be checked by the supplier, e.g. for damage, paint scratches, etc. The result of the inspection and assessment must be part of the FAI documents that the supplier sends to RME. Furthermore, meaningful images of the initial sample must be sent digitally, which, in addition to the external appearance, also show the attachment of the type plate and, if necessary, other markings (e.g. laser warning notices) on the initial sample. On the basis of the images and the supplier's assessment, the PQM evaluates whether the external appearance can be accepted. If necessary, he will request support from the technical department.

If physical sampling of the initial samples is planned, evaluation based on images is not required (see 3.5.2).

3.3.1.5 INITIAL SAMPLE CONFIGURATION

The configuration status of the initial sample must be documented in the form of LU and parts lists, configuration identification document (KID) and, in the case of software, additionally by Version Description Document (VDD). The documentation can be prepared either by RME in the case of orders in accordance with the drawing or by the supplier in the case of development orders. Furthermore, the actual configuration (ACTUAL-LU) must be documented and correspond to the specifications of the target configuration (TARGET-LU). If RME is responsible for the target specifications of the configuration ("build to print"), the configuration status of the initial sample must correspond to the valid material specifications from SAP. For drawing parts in particular, it must also be checked whether the commissioned drawing versions correspond to the valid RME specifications according to SAP. The PQM checks whether the documents verifying the configuration are available and whether they correspond to the target specifications.

The PQM checks the results and evidence for completeness and correctness and makes the decision in the initial sample inspection report as to whether the respective points are fulfilled or must be rejected. If the inspection points are not applicable, the PQM checks the "Not required" box on the FAI cover sheet.

3.3.2 ASSESSMENT OF THE INITIAL SAMPLE

In addition to documentary evidence, the external appearance of the initial sample is also assessed by RME. This can either take place on site at the supplier's premises or the material must be sent to RME for the initial sample inspection. In particular, the sample must be inspected for visible damage or recognizable deviations from the drawings (e.g. paint damage, scratches on lenses, helicoils used, compliance with IPC specifications, etc.). Furthermore, the marking of the initial sample with the correct label or type plate and, if required, warning notices (e.g. laser warning notices) must be checked. The assessment of the initial sample can be carried out either by the PQM or a specialist body designated by him/her (e.g. incoming goods inspector). The point is considered fulfilled if the appearance of the initial sample corresponds to the desired series status.

3.3.3 ASSESSMENT OF THE PRODUCTION PROCESS

The necessity of an assessment results from the FAI category of the respective material and is determined by the PQM during FAI planning. If necessary, the PQM can also decide to carry out an assessment, even if the FAI category does not require it. The supplier will be informed in the preliminary meeting whether an on-site assessment will be carried out.

It is not necessary to carry out a new assessment for each material as long as the production site and the production process for the various materials remain the same and the last assessment was carried out less than a year ago. The planning and preparation for the visit to the production site is carried out in consultation with the supplier. During the visit to the production site, the following sub-processes should be assessed and evaluated:

- **TP1 Incoming goods**
- **TP2 Production environment**
- **TP3 Production**
- **SP4 Quality assurance**
- **TP5 Outgoing goods inspection**

The assessment is carried out using the assessment template *4.02.F.0025 Assessment of the production process* and is part of the overall assessment of the initial sample inspection. On the cover sheet of the initial sample inspection report, the PQM enters the percentage of the overall evaluation achieved in accordance

with the evaluation template. The documentation of the evaluation must be attached to the initial sample inspection report.

3.3.4 DEALING WITH NON-CONFORMITIES

If deviations from the inspection points are found during the FAI, these must be documented as **residual points** and assigned to the inspection point accordingly (FAI report). If defects are found, the supplier is obliged to determine the causes and initiate corrective measures to remedy them. Each measure must be documented in the FAI report, addressed to a measure holder and contain a due date. If measures have been defined that are to be carried out by RME, RMMs must be created for this purpose and internal measures must be addressed to the relevant department. The PQM ensures that all measures have been implemented by the end of the FAI and notes this on the FAI report. The effectiveness of the measures introduced is verified by producing a defect-free sample under series production conditions. Samples that have already been produced can be released for use under certain conditions by means of a special release (see *4.02.P.0007*).

If it is foreseeable during the FAI that the non-conformities found cannot be corrected to a satisfactory result, the PQM may decide to conclude the initial sample inspection with open remaining points. Release for series production **cannot** then be granted (see 3.3.5).

3.3.5 EVALUATION OF THE INITIAL SAMPLE INSPECTION

The initial sample inspection is successful (series release granted) if

- all preconditions are met (see chapter 3.4),
- all required test points on the cover sheet of the initial sample test report have been accepted,
- if necessary, inspect the production process and overall assessment is at least 80% and
- all residual points have been rectified.

Once the evaluation has been completed, the PQM decides whether to release the product for series production:

- issued or
- is not granted

If series approval is granted, this can also be subject to conditions. In this case, the conditions must be documented on the initial sample test report. Possible conditions can be, for example, a restricted release for a limited period of time or for a specific project or the inspection of defined production processes.

If the conditions for successful completion of the initial sample inspection are not met, approval for series production cannot be granted. After consultation with the project, the PQM decides whether the initial sample inspection is to be repeated. Alternatively, another supplier can be selected (*4.01.P.0003*) or approval for series production can be dispensed with in principle. If no series delivery is to take place, additional quality assurance measures (including further tests) must be defined by the PQM (see chapter 2).

PROOF OF CHANGE

Issue:	Change description
10.07.2024	First issue; replacement for 7.01.VA.0003