

**MINEBEA
SUPPLIER
QUALITY
MANUAL**

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1. Minebea Supplier Quality motto.

Minebea Supplier Quality motto:

Reliable Partnership: Ensuring Excellence Through Supplier-Customer Commitment

The Supplier as a professional in its field is perfectly aware of the demands and requirements of the Automobile Industry. It is a Supplier responsibility to define and implement a quality policy in compliance with the Industry standards and customary practices, as well as with laws, regulations and standards in force. This Minebea Supplier Quality Manual (SQM) shall supplement the Supplier quality policy.

Nothing under this Supplier quality manual may be interpreted as relieving the Supplier from any of its obligations towards Minebea and especially its responsibility to deliver the Components in compliance with all documents that govern the relationship between Minebea and the Supplier.

Activities performed by each party and especially, inspections, audits, validations, testing and/or approvals made or granted by Minebea shall not affect the Supplier responsibility concerning the quality and reliability of the components delivered, as well as the compliance with its contractual obligation.

The aim of Minebea Supplier quality manual is to reinforce the Minebea expectations knowledge at Supplier base and by their application improve the overall performance of all interested parties and support the healthy business relationship.

2. Advanced Quality Planning for Product & Process.

Advanced Quality Planning for product and process is a structured method of defining and establishing the necessary steps, which supplements supplier quality policy and rules implemented to ensure that a component will comply with Minebea requirements.

Minebea Advanced Quality planning apply to all Minebea Suppliers listed here below:

Category of Supplier	Definition
Designer	Design components, which will be used for Minebea specific project and will meet Minebea specifications. The \supplier-designer is responsible for the definition and as the case may be responsible for the supply of the components.
Manufacturer	Develop a manufacturing process and manufacture a component designed by Minebea
Sub-contractor	Manufacture a component designed by Minebea using raw material delivered by Minebea (only charging hours)
Pass-Through Supplier (Handling Component)	Deliver a component directly to Minebea Customer or deliver Minebea Customer through a warehouse

Advanced Quality planning procedure.

The Advanced Quality Planning procedure defines the process to be followed to run a Supplier project and to go through validation of the design of product and process. This will ensure that the Supplier will be in a position to deliver, as of the Start of Production, the expected level of quality in line with Minebea requirements.

The Advanced Quality Planning procedure includes 8 stages (excluding the stage 0 consisting in the supplier pre-selection). Those stages apply to all Customer application projects and to components already used in production (product process changes). However, depending of the scenario of the project (Specific, Carryover, Transfer...) the different documents, checks or validations will be adjusted to the associated risk.

Those 8 stages are monitored in the module "Product Quality Assurance" (PQA) of the Minebea Puma Portal.

The Minebea buyer creates the new PQA project (linked to the component number) into PUMA and assign its management responsibility to the identified Supplier contacts.

Since then the Supplier is required to submit on time the deliverables of each stage to Minebea through the PUMA Portal. Communication language is English for all documents / data.

Supplier is responsible to keep the assigned PUMA PQA project under perfect control with a periodical review of planned / achieved activities are every PQA Stage at least on a monthly basis. In case of any known delay of any activity in PQA the responsible Minebea Buyer and SQE have to be formally informed and the PUMA PQA project have to be updated accordingly.

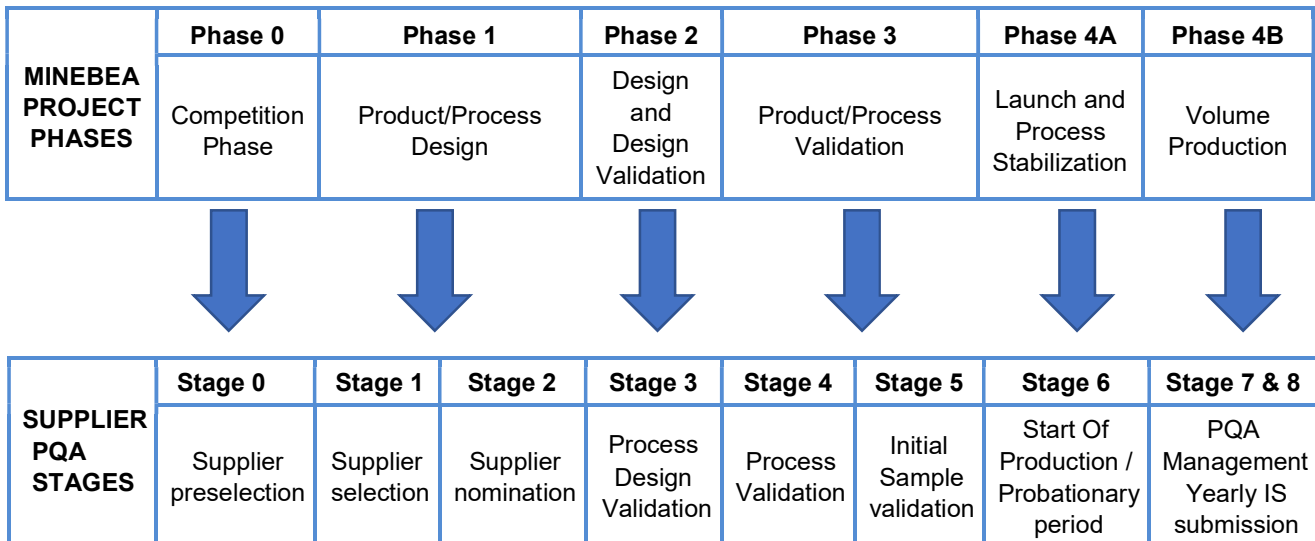
The scenario to be used will be chosen by the Minebea Purchaser during the PUMA PQA creation.

Depending on the project PQA scenario, the associated/requested documents will be automatically listed into PUMA PQA.

If one document is not applicable for specific project, the Supplier must obtain a "Non-Applicable" status from Minebea SQA. However, all documents with a "M" flag are mandatory.

The content / specificity of each PQA stage is described in the following pages.

The 5 phases of the “Minebea Project development process” are linked to the 8 stages of “Supplier PQA project” as shown below:



In order to simplify the process, Minebea pre-selected 14 different scenarios of project which are automatically set in PUMA PQA project and so requesting only the optimized deliverables.

No.	Scenario Names	PQA description
1	Specific	All projects where a new part must be developed / manufactured under specific Minebea design / Specifications.
2	Carry-over New project	Only Carry-over projects. Reuse of one serial part for a new project: same part design, same serial process and same Supplier. It can be used even if it is for a new Minebea factory.
3	Carry-over New tool	Development/ validation a new tool which will manufacture a serial product already validated and by the same Supplier. If the new tool is linked to a product design change and/or Supplier change, scenario “Specific” must be chosen.
4	Carry-over Tool transfer	Transfers of one serial product (with no design change) from a Supplier A to a supplier B
5	Carry-over Modification	Product design or process design change during serial life.
6	Carry-over Refurbishment	Validation of tool refurbishment, with no product design change and no supplier change.
7&8	Catalog and Catalog & RM	Catalog parts or raw materials. Meaning product manufactured under supplier or standard specifications
9	Directed	To be used for the validation of products developed and manufactured by Supplier imposed by Minebea customer
10	Delivery transfer	Transfer of an assembly line from Minebea factory A to a Minebea factory B. For all components which will be delivered from Suppliers to factory A, a “Delivery Transfer” scenario must be created by Minebea factory A, in order to validate the transfer.
11	Spare Part Tool transfer	To be used for all the transfers of spare parts from a Supplier A to a Supplier B or from Minebea to a Supplier.
12-14	Intercompany	3 various scenarios for Intercompany projects

2.1. PQA Stage 0 – Supplier pre-selection

The purpose of this stage is to validate that the performance of a potential Supplier whether he complies with Minebea expectations and that the Supplier:

- Guarantees the reliability of processes and keep records
- It's process of continuous improvement
- It's process to continuously capture what has been learned
- Clearly defined quality policy
- Organization capable to assure the quality at all stages of the component life and in line with Minebea project development phases
- The willingness to work with Minebea in a spirit of partnership and continuous improvement and problem-solving attitude

Minebea requests each Supplier to be IATF 16949 certified by an IATF recognized certification body. For Suppliers with surface technology (particularly galvanic and coating systems), a certification in accordance with DIN EN ISO 14001 or validation according to EMAS (Eco-Management and Audit Scheme) is required.

Under specific circumstances (Suppliers recommended by OEM, existing Suppliers within Supplier evaluation targets, catalog components and standardized supplies), Minebea could accept ISO 9001 certification only when the Supplier succeeds to pass Minebea system and/or process assessments. The Supplier shall ensure that his Sub-Suppliers also meet the above-mentioned requirements.

The Supplier shall nominate a PSR (Product Safety Representative) who is in charge of product safety and compliance with statutory and regulatory requirements. Product Safety Representative's function/role, name, telephone/mobile phone number, and e-mail address have to be shared with Minebea.

All potential Suppliers or Supplier intending to be part of "Minebea Supplier panel" for a given segment will be assessed. This assessment will be performed for each new Supplier as well as for each new production site of a validated Supplier.

During this assessment, the supplier shall comply with the following conditions:

- EVAL audit achieved with a minimum score of 80% and an approved action plan by Minebea for any non-conformities. The purpose of the EVAL audit is to identify all risks linked to the process management. This EVAL audit is conducted by Minebea Purchasing and SQA according to Minebea EVAL questionnaire during the on-site audit. EVAL questionnaire will be send out to the Supplier prior to the EVAL audit in order to allow the Supplier to be well prepared.
- Commodity Check List (CCL) assessment achieved with a minimum score of 80%. This CCL audit is conducted by Minebea SQA and based on the CCL applicable to supplier (one CCL per commodity and updated with the latest lessons learned faced in Minebea). Any Supplier rated below than 100% will be requested to implement an action plan to achieve a full compliance within 3 months after the initial assessment.

- Minebea Generic Requirements File (GRF) signed by the Supplier

Minebea SQA is responsible for tracking of Corrective/Preventive actions of each audit at Supplier and is responsible for audit findings closure.

For each Supplier, Minebea Purchasing will create the supplier into PUMA portal, and all assessments and results will be recorded into the Puma supplier sheet.

STAGE 0 deliverable is a Supplier validated into Minebea Supplier Panel.

2.2. PQA Stage 1 – Supplier selection

The purpose of this stage is to:

- Define the Minebea requirements that shall be addressed to the Suppliers
- Pre-select the Supplier to launch the RFQ (Request for Quotation)

Definition of Minebea requirements:

In order to specify adequately the Minebea requirements to its Suppliers – the Minebea project team under the responsibility of the Minebea buyer will establish the Minebea Specific Requirement Files (SRF). The SRF will include at least:

- Product specifications as a set of functional, technical and general specifications including the SPPC list (Special Product and Process Characteristics) *
- Project timing and PQA milestones
- Composition of Initial samples
- Tooling and packaging condition
- Quality and logistics targets
- Applicable terms and conditions

*The SPPC management have to follow the Minebea “Special Product and Process Characteristics (SPPC)” procedure.

Pre-selection of the Supplier to launch the RFQ:

The pre-selection is performed during a Pre-SoCo meeting (Minebea multi-functional team) where the team will:

- Verify the pre-selected Supplier is part of “Minebea Panel”
- Compare the preselected Supplier’s performance versus the project / SRF
- Analyze strengths and weaknesses of the Suppliers
- Validate the list of Pre-selected Supplier to launch the RFQ

Minebea Purchasing will send the RFQ to the Pre-selected suppliers for each PQA project and each component which would be purchased.

STAGE 1 deliverables are Minebea Specific Requirement File (SRF) defined, SPPC list available, Pre-selected Supplier list and RFQ sent.

2.3. PQA Stage 2 – Supplier nomination

The selection of the Supplier is performed during a SoCo meeting (Minebea multi-functional team) which will:

- Compare pre-selected Supplier's performance and answers versus the Requirement File
- Review quality of the answers and robustness of the quotation received
- Analyze strengths and weaknesses of the Suppliers
- Select the Supplier representing the best choice.

As soon as Supplier selection is decided by Minebea component specifications and drawings have to be updated if necessary and released, and Specific Requirement File (SRF) updated accordingly.

- SRF has to be agreed and signed by supplier, including SPPC list.
- Validation of final SRF compliance to Minebea original SRF by Minebea PTMs
- RASIC chart to be signed (when applicable) between Minebea / Minebea Supplier and Minebea Customer
- Only after the SRF has been signed by the Supplier, the Nomination Letter can be sent to the selected supplier.

STAGE 2 deliverables are Specific Requirement File (SRF) signed by the selected Supplier and Nomination letter sent to Supplier.

2.4. PQA Stage 3 – Design validation

The purpose of this stage is to ensure that product and process quality requirements are met before launching the tool.

The design validation could start already in Stage2.

- A design review shall be conducted by Minebea R&D and SQA with the Supplier following the Minebea standards (Sign Off / Feasibility commitment documents).
- This review shall ensure the robustness of the Design with regards to the Supplier manufacturing constraints, the Minebea & Customer interfaces, Customer specifications and SPPC requirements.
- Any PTC (Pass-through characteristic) have to be deemed as SPPC characteristic
- During that review, the measurement method shall be agreed between Minebea and the Supplier.
- The Supplier shall perform a FMEA study and shall include all Minebea SPPC (Product characteristics which are either customer interfaces or characteristics affecting Minebea or / and OEM assembly – visual aspect – product performance and / or reliability) in the input data. AIAG-VDA FMEA Handbook to be used as a guideline.
- For each SPPC, whether it is a SPPC listed by Minebea or an internal SPPC identified by the Supplier after FMEA review, the Supplier shall define a relevant control to ensure product/process conformity.

Risk assessment through the SPPC list will define the frequency of those controls which will be included in the Supplier control plan as follows:

- Poka-Yoke or 100% control camera control
- Statistical Process Control (SPC) with follow-up
- Start & end of production and its frequency of checks
- Checks in case of an intervention in the tool or raw-material change
- Initial Samples once per year (Yearly IS)

For characteristics not measured by the Supplier, such as raw material composition, flammability, etc. they shall be checked at minimum through the sub-Supplier's certificate of conformity prior any material release to production area (in case this is requested by Minebea).

The SPPC list must be updated by the Supplier and must be approved and signed by Minebea.

- The Supplier shall define a validation plan based on the SRF requirements, the Lessons Learned and the DFMEA analysis in case of Designer Supplier. For Designer Supplier, the Supplier shall conduct the design validation on prototypes.
- The validation plan will list all the testing required on Initial Samples collected during the Full Day Production Run approved by Minebea in order to validate the process impacts on the product.

The validation results compliant with the approved plan will be reviewed and signed by the Supplier representative and Minebea R&D.

Upon validation of Stage 3 by the supplier and Minebea, the Supplier shall be authorized to kick-off the tooling.

STAGE 3 deliverables are Specific Requirement File (SRF) updated and signed by the Supplier and All documents requested in Stage3.

2.5. PQA Stage 4 – Process validation

The purpose of this stage is to ensure that the process developed by the Supplier is capable to produce the defined components in compliance with Minebea requirements in term of Quality and Capacity.

After the First Off Tool (FOT) activity and validation, the complete process of the Supplier will be validated through:

- Process documentation (Manufacturing instructions, Maintenance plan, Quality checks)
- Measurement report on FOT
- Machine capability Cm/Cmk (when required by Minebea)
- Measurement System Analysis (MSA) for attribute and measuring gages.
- FDPR: Full Day Production Run
- Process audit and Commodity Check List audit
- Packaging sheet
- Validation of the product / process of sub-suppliers if applicable (Tier N validation)

First-off tool:

During stage 4, the component out of the off tool has to be evaluated and approved by Minebea in terms of dimensional and assembling. If the FOT component is approved at this stage, it is not a final approval of the component. The final approval will be given after Initial Samples submission (in stage 5), out of the Full Day Production Run in serial conditions.

MSA:

The capability of the measurement process, steady measured values, shall be proved on the basis of a variance analysis (ANOVA) in accordance with VDA Volume 5 with measurement.

Calculation of measurement uncertainties from the measuring system uncertainty budgets:

- number of repeat measurements, at least 25.

Calculation of the measurement uncertainties of the entire measurement process:

- In much the same way as in the former method 2, at least two tests with two or three appraisers shall be carried out on 10 test objects. The minimum number of test objects required is 3.

Attributive testing with reference values:

- The recommended number of random samples for each appraiser to rate is 30 (at least 2 appraisers).

Product validation plan:

The product validation plan (defined in stage 3) shall be started by the Supplier with an off-tool and off-process parts. Most of the case this validation plan will take weeks and can pass over the date of Stage 4 validation. In any case the results shall be available before Stage 5 validation, as mandatory for IS approval.

Process readiness:

Process is ready to be assessed at FDPR and Process audit after the following criteria are achieved:

- Full and green dimensional reports on minimum 5 parts per cavity
- A machine capability, when required by Minebea, on at least 30 following parts selected in sequence ($Cm/Cmk \geq 2$) conducted on the basis of the VDA publication Volume 4.
- All control devices are validated through an MSA study
- All process documentation is validated and available at each workstation
- All operators are trained and qualified

Note: Minebea hold the right to change the sample size or other requirements of capability study in case of OEM request and this should be defined in Project phase and also proceed with FDPR or Process audit under exceptional circumstances when some of the requirements are not met.

Supplier self-FDPR and Readiness assessment:

The Supplier is required to perform a self-FDPR and pass the Supplier Readiness Assessment (SRA) using for both the Minebea FDPR template. The evidence of self-FDPR and SRA must be uploaded into PUMA PQA portal. The Supplier shall pass the self-FDPR and comply with all requirements of the SRA prior requesting Minebea SQA to organize on-site FDPR performed with Minebea attendance.

Minebea FDPR & process audit at the Supplier plant:

The audit and FDPR are valid only if the process audited is the one that will be used in mass production (equipment and conditions):

- The FDPR duration must be sufficient to assess the stability of the process (minimum 3 hours of production and 300 components). However, depending on the nature of the component, Minebea reserve the right to require the supplier to run longer and more components than here referred.
- The quantity run during the FDPR shall be sufficient to ensure the above criteria in the downstream processes (i.e. surface treatment) which have different production rate.
- The FDPR must include one or several change-overs of version (include change of production shift)
- The process audit and CCL audit are performed on the full process (from Incoming to delivery)
- For non-audited shift(s), supplier will have to provide training reports and evidence of compliance at run at rate target.

The process audit is based on Minebea questionnaire or VDA 6.3 process audit questionnaire. The CCL audit will follow the Minebea Commodity Check List associated to the Supplier segment. Those check lists are based on the state of art of the technology and the Lessons Learned by Minebea through the past Supplier incidents management.

The SPPC list, agreed between both parties in stage 3, identifies at-risk SPPCs based on product design constraints and the manufacturing process variability.

- Each SPPC classified at risk will require a short-term capability study (Cp/Cpk) performed on at least 30 components selected randomly and not in sequence during the FDPR. Those Cp/Cpk results shall be equal or greater than 1,67 and will have to be submitted during stage 5 for IS validation.
- If the normality of the process distribution data cannot be demonstrated (Henry test – Khi2 – Kolmogorov test) the capability calculation result is therefore statistically not sound and the process has to be considered not capable.
- In case capability is not demonstrated the Supplier will have to adapt specific control plan, including Poka-Yoke or 100% automatic control in order to put characteristics under control and meet specification. This requirement is valid also during serial production when Supplier is not meeting the Ppk1.33.

Note: MINEBEA hold the right to change the sample size or other requirements of capability study in case of OEM request and this should be defined in Project phase.

Following Minebea FDPR/ Process audit, the following reports must be issued and uploaded in PUMA PQA portal by Minebea SQA:

- FDPR report: conditions, capacity data, quantities produced and rejected, analysis of defects, speed of the production line and status of the global capacity if the machinery is used also for other products or Customer.
- Process audit report
- CCL report

FDPR validation:

- The FDPR is validated if the overall process utilization is below 100%. However, if the overall process utilization is between 85% and 100% a flag is raised and an action plan should be implemented to ensure adequate capacity.
- The process audit is validated if the score achieved is above 80% without any critical CAR (Corrective Action Request). In case of VDA 6.3 audit, Classification A and overall level of compliance $\geq 90\%$ are required.
- The CCL is validated if the score achieved is above 80%. However, if the score is between 80% and 90% an action plan shall be implemented.

If any of those 3 items failed, the Supplier shall define and submit an action plan to Minebea SQA. This action plan must treat all the non-conformities (CAR) seen and listed in the 3 reports. This action plan must be implemented within 10 days and must be sponsored by the Top Management of the supplier.

Minebea SQA will conduct a new FDPR and/or Process audit and/or CCL audit after release of each supplier CAR.

Traceability: Supplier must have a traceability system to trace back any component to the original batch of material (raw-material / primary components) used. Full traceability to include material lot identification, date, shift, assembly process, and delivery, verification of repair, and containment assurance.

The certificate of raw-material used during FDPR (and so for the Initial samples) shall be uploaded in PUMA by the supplier.

Initial Samples:

Initial samples must be taken during the FDPR and delivered in serial production packaging together with full documentation as specified in the Minebea SRF.

At least 5 Initial Samples must be kept at the Supplier for the entire life of the component plus one calendar year and must be accessible by the Supplier and Minebea at any time.

Validation of the packaging:

The Supplier shall prepare the original and substitution packaging in accordance with the specification in the SRF using Minebea packaging sheet form. In case this is not available, the Supplier could use their own form. This packaging must preserve the quality of the product during handling, storage and transportation. A transportation test shall be performed by the Supplier to ensure the packaging efficiency. The setting of the transportation test must be aligned with the real transport route and considered all parameters (distance between Supplier and Minebea, type of transport, number of layers...).

The packaging will be validated by Minebea on the first packaging received and on the following document analysis:

- Packaging sheet
- Label
- Substitution packaging definition
- Test transportation report

STAGE 4 deliverables are Supplier process validated, Process audit and FDPR validated by Minebea.

2.6. PQA Stage 5 – Initial sample validation

The purpose of this stage is to validate that the component (performance, characteristics, reliability, capability...) comply with Minebea requirements and that the process developed by Supplier is capable to produce the defined components in compliance with Minebea requirements.

Master samples and initial samples file will be archived at the supplier plant during 15 years after the end of lifetime of the manufactured product, including Aftermarket business. They will be used as reference for comparison on the YIS report.

The supplier will ship the Initial Samples to Minebea SQA and will upload his PSW and all requested documents in PUMA.

The Initial sample file is validated by Minebea SQA if all the items listed below are uploaded in PUMA and approved:

- PSW signed by the supplier and compliant with Minebea requirement
- Process audit – validated by Minebea
- Full Day Production Run validation – validated by Minebea
- Dimensional report – validated by Minebea
- SPPC Characteristics capabilities – validated by Minebea
- Raw material Conformity – validated by Minebea
 - Conformity of the raw material certificate with Receiving date / Inspection result / Material reference / Mother coil number (if applicable).
 - The Raw material batch number used for the manufacturing of IS parts must be embedded into the Initial Sample Report. This shall allow a clear link between the IS file and the raw material certificate
- Supplier validation test – validated by Minebea
- Minebea assembly test – validated by Minebea
- Minebea / Minebea Customer Tooling ownership – photo evidence with of whole Tooling and marking of ownership – validated by Minebea
- Functional tests and vehicle tests* – validated by Minebea
- Packaging – validated by Minebea
- Report on subjective requirements (appearance - aspect, Squeak and Rattle noise) if applicable – validated by Minebea
- IMDS Database data entry completed – validated by Minebea
- YIS frequency approved by Minebea SQA and recorded in the Control Plan.

*The Supplier validation plan is considered completely executed when Minebea has completed its validation respectively on Minebea product and on the vehicle. Therefore, the supplier validation is deemed to be successful when Minebea and Minebea Customer have passed their own validation.

When all the initial sample deliverables have been validated (internal IS report signed by all Minebea Project Team Members), Minebea SQA will release the PSW signed and send it to the Supplier. This is the official IS approval decision.

In case the A0 status of ISR cannot be achieved on time, the Supplier is responsible to request an Interim ISR approval. This approval should be approved by Minebea based on provided evidence of fulfilled PPAP requirement, the outstanding PPAP requirements list and an action plan with due date and responsible person.

Deviation and Interim PSW validity are maximum 90 days. After 90 days the Supplier have to submit a Full ISR in status A0. In case this is still not possible the Supplier have to request a new Interim ISR.

ISR decision matrix:

ISR status interim – Parts or Process or both not meeting the PPAP requirements.

ISR status A0 – parts and process fully meeting the PPAP requirements.

<u>Process or Product validation</u>	<u>Decision</u>	<u>Material decision</u>
<u>Not full meeting PPAP requirements</u>	<u>Interim approval</u>	Open order authorized
<u>A0</u>	<u>Full approval</u>	<u>Delivery without restrictions</u>

STAGE 5 deliverables are validated Initial sample report (ISR) and PSW signed and sent to Supplier.

2.7. PQA Stage 6 – Start Of Production & probationary period

As soon as the Initial Samples have been approved by Minebea, the Supplier is allowed to deliver the components to Minebea according to the call offs as well as to the requirements of this chapter. This is the serial production phase.

The Supplier is fully responsible to deliver according the specifications and in line with the approved ISR.

All qualification, homologation, environmental, traceability and production processes records linked to the execution on Safety & Regulation characteristics must be available & readable during 15 years after the end of lifetime of the manufactured product. The records and production sequences must be available for Minebea and authorities or legal agencies access on request from Minebea.

Probationary period:

Minebea requires in this stage the implementation of a Reinforced Control Plan by increasing the frequency of the control plan as validated in Stage 4.

In addition, a ramp up Control Shipment Level 1 (CSL1) at the Supplier plant must be implemented during a 3 months-period following the Start of Production (PSW approved by Minebea) and a 6 months-period in case of a pass-through component. This must be made out of the production line area in a dedicated zone following a specific CSL1 instruction approved by Minebea.

The conditions to exit the Probationary period are:

- Zero C1 / C2 incidents
- Zero defect detected in CSL1
- TLR (Total Line Rejects) performance is not increasing during the last 3 months
- Long term Capability results (Pp/Ppk) on at least 30 samples on each SPPC equal or greater than 1,33
- In case capability is not demonstrated the Supplier will have to adapt specific control plan, including Poka-Yoke or 100% automatic control in order to put characteristics under control and meet specification.
- All suppliers' action plans must be closed.

Note: Minebea hold the right to change the sample size or other requirements capability study in case of OEM request defined in Project phase.

If the conditions above are achieved within a 3 months-period (6 months in the case of a passthrough component), the PQA status is granted and the validation of Stage 6 in PUMA portal formalizes the notification of PQA status achievement allowing the supplier to deliver to Minebea with the inspection agreed in the control plan for mass production.

If the conditions above are not achieved within a 3 months-period (6 months in the case of a passthrough component), Minebea will request to supplier to implement a Control Shipment Level 2 (CSL2) for 1 month renewable. This activity will be handled by a sorting company contracted by the supplier and approved by Minebea.

Supplier is obliged to fulfill the CSR of Minebea Customer (Customer specific requirements) mentioned in this SQA Manual or required by Minebea Customers during project or serial life.

STAGE 6 deliverable is a Product Quality Assurance granted.

2.8. PQA Stage 7 – Product Quality Assurance management

When a component is granted the Product Quality Assurance (PQA) status, the component is no longer subjected to a probationary control period.

Any Non-Conformity related with the delivery of parts without respecting the requirements agreed is subjected to a deviation request raised by the Supplier prior to the shipment and approved by Minebea, using the Supplier Deviation Submission Request template. The parts with approved deviation have to be marked on each box with a deviation No.

In case the deviation is not approved by Minebea before shipment the Supplier is not authorized to ship these parts to Minebea.

All PQA component deliveries must be identified with a PQA label on each container box.

Upon request, the supplier must provide Minebea with the results of inspections carried out for each batch delivered.

Case of PQA status suspension.

After analysis of the causes, loss of PQA is confirmed for the component involved if a specific process and/or design is found to be at fault.

When PQA status is lost – the Supplier must take off PQA identification and when applicable identify with a label on each box and container, the level of requested control shipment (1 or 2).

If the conditions agreed to remove the PQA suspension are achieved, the PQA status is recovered. Minebea SQA authorize the Supplier to re-identify boxes with the PQA label.

Case of a product, process modification or transfer of a supplier production line – the PQA status is therefore lost and a new PQA will be opened and will need to be re-granted going through the stages 2 to 6 of the PQA.

Tool management.

The control plan shall include the needed increased inspection frequency related to tools (e.g. dies, molds and cutting tools) coming close to their estimated life time.

The Supplier shall give timely prior notice of any foreseeable maintenance of the tools or notification about upcoming End of warranty of the tool, so as not to jeopardize any scheduled deliveries for the part's defect free production.

Supplier is obliged to collect the evidence of tool drawings, concept, operation and safety instruction, machinery FMEA, maintenance records and modifications history. The Supplier should inform Minebea about actual cycle time and status of tool each 6 months.

Minebea may at any time inspect, itself or through third parties, the tools, their quality or the place where they are kept.

Any tools, jigs within Minebea or Minebea Customer ownership are in the supplier's possession, they shall be insured by the supplier, at the supplier's expense, against all customary risks (fire, theft, damage by third parties, etc.).

STAGE 7 deliverable is a PQA status maintained.

2.9. PQA Stage 8 – Yearly IS submission

As required in the IATF 16949 standard a Yearly requalification have to be carried out on all products in accordance with Minebea specifications (the product requalification can be performed per product group (family) only with Minebea SQA agreement).

The Yearly IS content and frequency must be defined in the Supplier control plan and agreed with Minebea SQA at the initial IS validation stage. Supplier is obliged to provide the Yearly IS even the Control plan was not fully agreed in terms of Yearly IS submission.

Minebea SQA is responsible for setting the Yearly IS date in PUMA PQA system, so the Supplier receive an automatic notification 11 months after ISR date (PSW approval date). Supplier is obligated to deliver the missing Yearly IS documents also in case the request was not done over PUMA PQA, but Minebea SQA is requesting the documents in other way (eg. email request).

Supplier have to upload the Yearly IS documents to PUMA PQA portal, so the 12 months period between Initial ISR and Yearly requalification can be still achieved.

Supplier is obliged to provide the below documents and fulfill the requirements as:

Document	Requirement	Sample size
Dimensional report	All drawing dimensions	Min. 5 parts. In case of more cavities all cavities have to be covered with at least with 1 part
Capability studies	All SPPC dimensions CpK min. 1.67 PpK min. 1.33	Either at least 30 parts per P/N from actual production or Supplier could also use the production measurement data to proof the capability with 125 parts.
Material certificates	Raw material certificate	1 batch of raw material
PV tests	Based on agreement at Project phase	Based on agreement at Project phase

Note: Minebea hold the right to change the sample size or other requirements of Yearly requalification in case of OEM request defined in Project phase.

In case of deviations, Minebea SQA and relevant Minebea sites where the suspicious parts are delivered have to be informed with a risk analysis and action plan to back on track to conformity.

Supplier is responsible for tracking of the action plan until the part is again back in required specification.

STAGE 8 deliverable is a Product conformity sustainably achieved.

3. Continuous Quality Improvement

The Generic Requirement File (GRF) and Specific Requirement file (SRF) are giving the details of Supplier's objectives in terms of Quality and Delivery Performances.

A Quality Improvement Plan (QIP) could be requested from Suppliers to achieve the level of Quality and logistic required by the automotive industry.

The development of new business between Minebea and a Supplier depends on the achievement of the Quality and Logistics targets and on the implementation of a formal Quality Improvement Plan (QIP) to meet the Zero incident in Minebea and Minebea Customer. In this chapter, focus is done on:

- Incident processing
- Supplier evaluation - performance indicators
- Supplier Quality Improvement Plan
- Supplier development and follow up
- Product and process change management rules
- Audits and audit schedule
- RFMEA

4. Incident (Claim) management

The Supplier shall notify all affected Minebea sites within 24 hours or sooner in the event non-conforming product has been shipped. This pro-activity is requested to prevent further escalation and costs increase.

All incidents will be managed through PUMA Claim management module. Automatic notification will be sent by the system to the Supplier. An official email is also issued by Minebea SITE SQA with a detailed explanation of the Incident including expected actions from Supplier.

The suppliers shall exclusively use the Minebea 8D template and shall answer through the PUMA Portal by uploading the updated 8D template.

Definition of Quality incidents:

Claim category	Signification	Definition
WR	The problem affects the car end-user	Any reject occurring “in the field” that is caused by a non-conformity on a component delivered by a supplier
C1	Okm claim affects Minebea external customer	Any line or end of line reject at the customer or customer complaint that is caused by a component delivered by a supplier
C2	The problem is discovered in Minebea plant	Any single component rejected from Minebea Site: Non-conformities identified in the manufacturing process or at incoming inspection
CP1	Same as C1 but issue occurring before Initial Sample approval	Issues identified during the development stages
CP2	Same as C2 but issue occurring before Initial Sample approval	Issues identified during the development stages
HIS - High severity incident		C1, Safety or Regulatory characteristic claim or Recurrent

Reoccurrence incident definition:

- An incident is recurrent if, on the same supplier, same component or component coming from same tool where defect root cause is the same as other already processed incident.
- During the declaration in PUMA Portal by Minebea, an incident can be opened as recurrent if the defect is the same defect as one other incident in the last 24 months. Once the root cause is known (PD step), the recurrence is confirmed or infirmed.
- For WR incident, the dates to be considered are the manufacturing date and implemented action plan date.

Administrative fees and charge back:

- Generic Requirement File (GRF) specify the associated administrative fees of each incident category.
- This fee is to cover the administrative costs created in Minebea in order to manage the supplier incident. This fee will be charged back to the supplier with all the other costs supported by Minebea (sorting, premium freight, customer penalties, etc)
- The final costs occurred due to faulty part from Minebea Supplier are handled over chargeback process in PUMA Portal.

Definition of Logistic incidents*:

Category	Definition	Location of the logistic perturbation and example of incidents
L1	The logistic incident affects the Minebea external customer or end-user	Customer Service Rate impacted due to shortage of part deliveries leading to have a risk of customer line shutdown
L2	The logistic incident affects the Minebea production lines	Production line shutdown at Minebea due to shortage of part deliveries
L3	The logistic incident affects the Incoming Logistics (Receiving / Warehouse) organization	Perturbation detected at Minebea receiving

*For exact Logistic incidents classification and management please refer to Minebea Logistic guidelines.

Incident processing

When a defective component is identified, Minebea will notify the Supplier responsible of the incident using the claim management module of PUMA Portal. The Supplier will have to answer through the 8D template and upload it updated at each step (Puma page) of the incident.

The 4 solving steps of an incident are:

8D phase	8D steps	8D description
QR (Quick response)	D1 – D3	Problem description and containment
PD (Plan Do)	D4 – D6	Root cause analysis and action plan
CA (Check Act)	D7	Corrective action effectiveness
CI (Continuous improvement)	D8	Lessons Learned / closure

The supplier reactivity to answer the claims is measured and automatically recorded in PUMA. Minebea reactivity requirements are as following:

- Quick Response (D1-D3): Within 1 working day from incident notification
- Plan Do (D4-D6): Within 7 days from incident notification
- Check Act (D7): Within 14 days from incident notification
- CI (D8): Within 30 days from incident notification

All suppliers are required to systematically consult and use the Minebea PUMA Portal and associated documents. Supplier is obliged to process every Claim into validated status based on above mentioned timings.

Each 8D step submitted by Supplier is evaluated by Minebea SQA via PUMA Portal and is either refused or validated. In case the step is refused Supplier have to submit an updated response. Only validated 8D step in PUMA Portal is considered as closed step.

The Suppliers shall ensure that they have, at any time, a Quality contact with an access and knowledge to Minebea PUMA Portal. New contact can be created directly in the PUMA Portal and training modules are available on line.

All answers (QR, PD, CA & CI) must be formalized in English.

A process audit could be conducted by Minebea SQA prior to incident closure.

In case of reoccurred C1 incident, the Supplier shall perform a Reverse FMEA on the station where the defect is coming from.

Cancelled incident:

If the 8D analysis concludes the Supplier non-responsibility and this conclusion is approved by Minebea SQA then the Supplier incident is cancelled.

Sorting activities:

For any sorting activity requiring a sub-contractor in Minebea premises, the Supplier shall select a sorting company approved by Minebea. Supplier must ensure that:

- Supplier shall mandate a sorting company within the first 2 hours following the incident notification in order to ensure that Minebea is secured latest 4 hours following the incident notification to the Supplier
- “Mission order” (sorting order) is signed by Supplier representative
- sorting company is receiving a control instruction how and what to sort including photos or video instruction if needed
- there is training record from sorting company
- list of parts for sorting and qty is identified before sorting start
- Minebea receives a sorting report at least each 24 hours (qty blocked, sorted, OK/NOK, defect type, % of NOK parts)
- In case of delay, Minebea will contract directly a sorting company to prevent a line stoppage and will charge back to the Supplier all related costs

Field Failure Analysis / No Trouble Found (NTF):

The Supplier must implement a warranty management process to systematically analyze parts returned from the field. Any warranty case has to be managed over 8D report with extension where requested by Minebea (eg. complex problem or bigger test reports)

This process must comply with the requirements of VDA volume “Field Failure Analysis & Audit Standard”.

Tests and its sequence (e.g. standard test, failure-oriented test, test under load) must be jointly agreed after the return of claimed parts. In case the Supplier is not following the agreement or disassembling the parts and by this preventing further testing of part then Minebea is judging this failure/parts as Supplier responsibility.

If Supplier is declaring an NTF status of returned part the Supplier must describe and document in the 8D report how did he come to this conclusion. This analysis is then jointly reviewed by Minebea and Minebea Customer and conclusion made out of this review.

The cost of Warranty claim with confirmed Minebea Supplier responsibility is fully charged to Supplier including Minebea Customer costs which could include dismantling and replacement of defective parts, transport costs, any testing cost or warranty factor cost which occurred purely because of this claim.

Unreasonable number or ratio of OK based on parts analysis can lead to an NTF process upon Minebea or its customer request where all potential root causes must be investigated and eliminated.

5. Supplier evaluation

Minebea is evaluating each Supplier’s performance on a monthly basis. The evaluation results are managed over PowerBi tool and are available upon Supplier request. Selected Suppliers will receive the Monthly evaluation results from Minebea automatically.

General Supplier classification from monthly evaluation is divided into 3 categories:

- A Supplier 85-100 points**
- B Supplier 65-84 points**
- C Supplier 64 and below points**

Supplier categorization and Supplier improvement at each categorization:

Supplier category A:

- Supplier is monitored, no extra activities expected

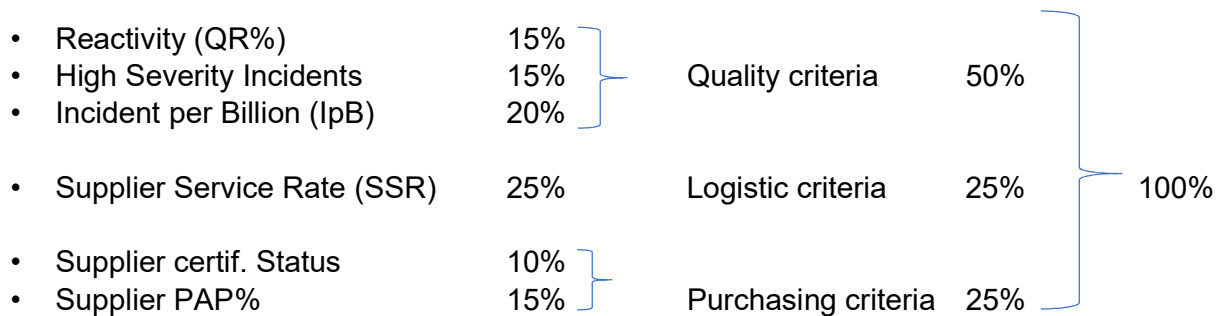
Supplier category B:

- Supplier is monitored
- Supplier self-audit report is expected within 2 weeks from request receive
- Action plan for audit non-conformities and other issues reported by Minebea are expected
- In case of severe performance deterioration also an on-site audit could be requested from Minebea side

Supplier category C:

- Supplier self-audit report is expected within 2 weeks from request receive
- Action plan for audit non-conformities and other issues reported by Minebea are expected
- Site audit could be requested from Minebea side. In case of TWS program the on-site audit is mandatory
- Supplier can be further monitored over TWS (Top Worst Supplier) program
- Supplier in assigned into NBOH category (New Business on Hold) and could continue into further escalation and Phase out

Overall evaluation criteria are defined as below:



In more detailed view the exact criteria and weighting for each category are defined as below:

Quality Criteria (max. 50 points):

Reactivity 3 Months Rolling (3MR): 15 points max

- Quick Response % over 80% 15 points
- Quick Response % between 50-80% 10 points
- Quick Response % below 50% 0 points

High severity incidents 3 Months Rolling (3MR): 15 points max

- No such incidents 15 points
- 1 or more incidents 0 points

Incident per Billion (IpB) 3 Months Rolling (3MR) 20 points max

- Target from last fiscal year met – 3MR IPB is lower 20 points
- 3MR IPB is within 20% over the target 10 points
- 3MR IPB is more than 20% over target 0 points

Logistic criteria (max 25 points)

Supplier Service Rate (SSR) 3 months rolling (3MR) 25 points max

- Above 90% 25 points
- Between 70-89% 10 points
- Below 70% 0 points

Every delivery (Minebea demand) / part number is evaluated separately.

For every delivery / part number an overall completion % is calculated.

The points are then summarized over the 3 months rolling, and an average is calculated

Purchasing criteria (max 25 points)

PAP (Productivity) 15 Points max

- PAP over 2% 15 points
- PAP between 0 - 2% 5 points
- PAP at 0% 0 points

Supplier System Certificates: 10 points max

- Valid IATF16949, Valid ISO9001 certifications 10 points
- Any of the certifications above are missing / expired 0 points

Minebea SQA department is holding the right to request and assign an 2nd or 3rd party consultant/resident to monitor and guide activities at the Supplier's site when performance is declining, Supplier is escalated into TWS program or Supplier is in distress and is not fulfilling the Minebea needs. The requirements could change, but in general these are:

- Providing a clear improvement plan which's execution can be regularly monitored
- Providing of action plan for audit findings with defined actions, resp. persons, deadlines and status
- Daily conference calls with Minebea representatives with presentation of actual production and quality results or delivery plan to Minebea.

The expenses related to mentioned Consultant/Resident is at Supplier's costs.

6. Supplier Risk assessment and Quality Improvement Plan

Suppliers should have a documented Supply Risk Management Operating System for all production processes and manufacturing facilities, to satisfy Minebea requirements in the event of an emergency. These plans have to be made available upon request to Minebea and have to contain the Risk analysis, preventive actions and contingency planning.

Emergencies may include, but are not limited to:

- Equipment and key equipment failures
- Purchased materials (components / raw materials) shortage
- Natural disasters
- Fires
- Service disruptions
- Workforce shortage
- Utility interruption
- Warranty
- Information system failure

In order to achieve the Targets defined in the Generic and Specific Requirements Files, the Supplier can be requested to define and deploy a formal Quality Improvement Plan (QIP) based on a continuous improvement strategy.

The QIP shall address all performance tracking indicators defined and non-conformities (declared by Minebea and/or found internally as a risk to affect Minebea). The Supplier shall analyze, with facts and data, the performance and situation on the previous period based on the following questions:

- What was the performance reached in the previous year compared to the target?
- What improvement actions were done and what efficiency has been obtained?
- What is the root cause explaining the gap between results and targets?
- What needs to be done in the next period to reach the targets?

This analysis shall consider the Lessons Learned from the previous incidents as well as the weak points in the manufacturing process and in the management identified during all kind of audits (Internal or external).

Based on this analysis, the Supplier shall define the strategy and the detailed action plan to be deployed for the coming year, specifying actions, lead-time and responsibilities.

Minebea can request this QIP at any time and will assess it during the different visit. This QIP could be merged with Top Worst Supplier program action plan.

RFMEA (Reverse FMEA):

In addition, Minebea requests its Supplier to deploy the RFMEA method. Each Supplier shall deploy the RFMEA and perform at least one RFMEA on each part number delivered to Minebea every 3 years.

In order to perform this activity, the Suppliers shall define one or several RFMEA auditor teams and a RFMEA audit plan.

The Suppliers shall share its RFMEA plan, RFMEA achievement status and the number of findings/action plan with Minebea SQA Engineers.

7. Supplier Development & Follow-up

Minebea has set up a follow-up of the Supplier according to their quality performance:

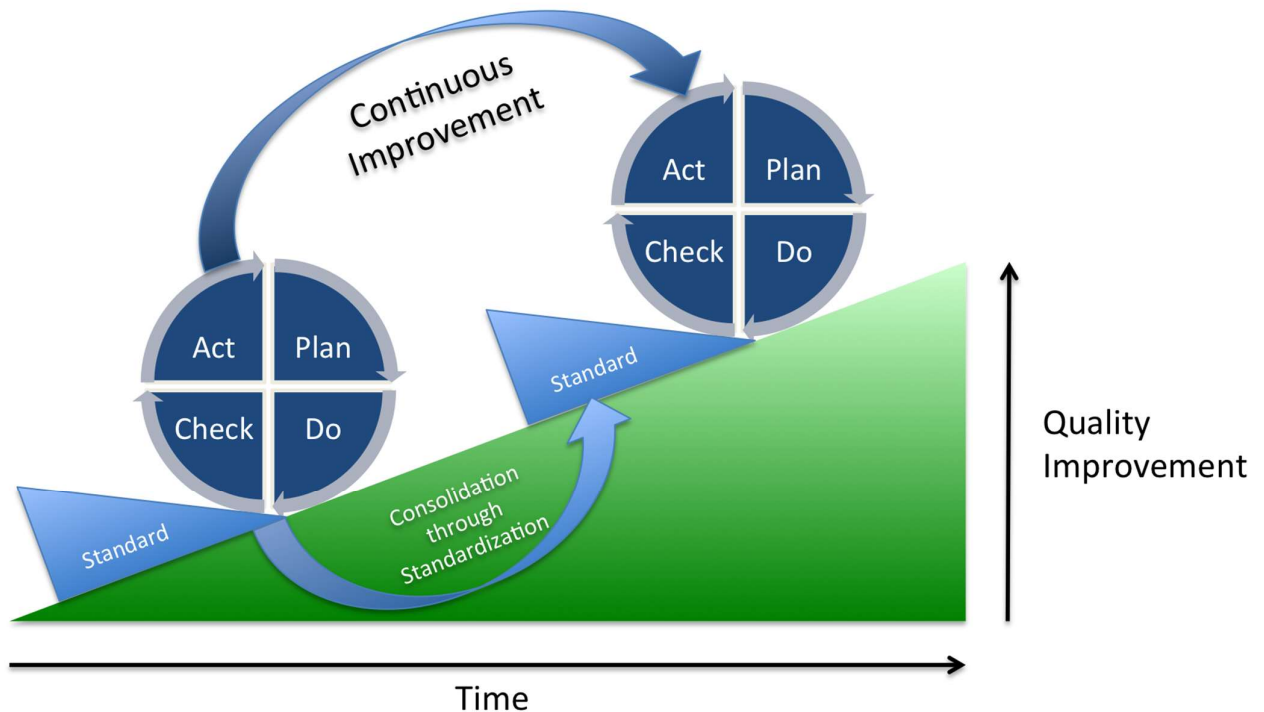
- When the supplier Quality performance is stagnating, the following activities (PDCA Deployment, Fundamentals of Quality) may be launched by Minebea.
- When the supplier Quality performance is worsening, the following activities (CSL1/ CSL2, Top Worst Suppliers program, NBOH Status, Phase-out) may be launched by Minebea.

PDCA deployment:

Minebea may propose to support Supplier improvement by implementation or reinforcing of PDCA Methodology:

Plan	Establish objectives and processes required to deliver the desired results.
Do	Carry out the objectives from the previous step.
Check	the data and results gathered from the do phase are evaluated. Data is compared to the expected outcomes to see any similarities and differences
Act	Process improved and has better instructions, standards, or goals

Supplier have to continue in the PDCA loop and always define new gaps to the requested performance.



Control Shipment Level 1 and 2 (CSL1 and CSL2):

CSL1 and CSL2 will be required to the Supplier in order to ensure 100% conform deliveries. They will be required while the full recovery of the conformity on the production process or /and the product is not proven.

- CSL1 – Following a request from Minebea, the Supplier will implement a CSL1 in addition to the control plan of its production.
The CSL1 will be operated out of the production line in a dedicated area and in accordance with a specific control instruction approved by Minebea. Supplier will make available the evidence that operators have been trained to the CSL1 Instructions.

The performance of the activity will be monitored on a daily basis by the Supplier (tally sheet and QRQC Loop). The Supplier shall guarantee the conformity of the products delivered during the CSL1 implementation. The cost of CSL1 is at Supplier charge.

When the Supplier fails to guarantee the deliveries after a 3 months period, a CSL2 is then required to be implemented.

- CSL2 – the Supplier is required to put in place a CSL2 sorting activity by an external company, validated by Minebea, in line with criteria defined in the CSL1.
The cost of sorting will be at Supplier charge. CSL2 sorting results will be communicated to both Minebea and the Supplier.
- Exit of CSL1 or CSL2: shall be granted by a formal acceptance from Minebea and based on achieved performance.

Top Worst Supplier Program (Quality or Logistic)

Minebea has developed a Supplier Quality Improvement Program to improve the Quality or Logistic performance of the top offender Suppliers.

The Entry of Supplier into Top Worst Supplier program is based on Supplier evaluation on a monthly basis and the final decision of the entry is done by a Minebea TWS committee also on a monthly basis.

Minebea will identify the Top Worst Suppliers and will conduct following activities:

- Invitation letter: Minebea will notify the Supplier Top Management to come to Minebea
- Top Management meeting: Presentation of the QIP by the Supplier Top management in Minebea
- Gemba audit by Minebea: Minebea will challenge the implementation and the efficiency of the QIP, verify the deployment of Quality basics (Quality System, Process, Product).

The exit conditions of the Top Worst Supplier Program will be decided by Minebea and clearly set in the notification letter. The exit period is maximum 3 months. To exit the program, the Supplier shall achieve all targets agreed.

Alert NBOH and NBOH status (New business on hold):

Minebea can decide to raise an Alert NBOH to a Supplier for the following reasons:

- Quality: Supplier is not successful to exit from TWS program after second central loop - Loss of ISO/IATF certification
- Logistics: Supplier is not successful to exit from Logistic TWS program within 3 months
- Cost: Contracted productivity not respected by Supplier
- Price increase management: Some price increases are implemented with a unilateral way by the Supplier
- Project management: Delays in project launch. Supplier not in line with agreed schedule and is jeopardizing the project launch.
- Finance: Financial health control result shows high financial risk

If there is no improvement demonstrated in the 3 following months after the NBOH alert have been sent by Minebea, it can be decided by Minebea through the NBOH committee.

Supplier Alert NBOH or Supplier NBOH status will be subject to approval of the MINEBEA Purchasing Director and Supplier Quality Director.

Phase out:

If the Supplier is not showing any quality improvement in front of insufficient performances, Minebea may decide to phase the Supplier out.

8. Audits & Audit schedule

During serial production, Supplier sites will be re-evaluated by MINEBEA on a regular basis. The different audits performed by Minebea are listed in the chart below.

Minebea preventive audit plan is prepared for 1 financial year (April to March) and could be updated every semester based on below criteria or requests.

Criteria for Supplier audit:

- Delivery of safety or regulation related components
- The level of sales turnover with Minebea
- Overall Supplier evaluation performance (B or C category Suppliers)
- The number or severity of incidents or trend of incidents
- Delivery issues to Minebea
- The date of the last audit done by Minebea
- Request from Minebea production sites or Minebea Customers
- Possible new Business sourcing

Type of audit	Trigger	Frequency	Method
Eval	New suppliers	On Minebea request	at Supplier site
Process audit VDA6.3*	Validation of PQA Stage4 MINEBEA Customer request	At Stage4 or based on Minebea request	Self-assessment or at Supplier site
Product audit VDA6.5 (Yearly requalification)	Minebea, IATF and MINEBEA Customer requirement	Yearly within 12 months period	Self-assessment or at Supplier site
Commodity Checklist audit (CCL)	Eval, Process audit, preventive audits and TWS	On Minebea request	Self-assessment or at Supplier site
AIAG Special process Assessments ** (CQI)	Minebea and IATF requirement	Yearly within 12 months period	Self-assessment or at Supplier site
TWS Process audit	Suppliers entering the Top Worst program	On Minebea request	Self-assessment or at Supplier site
C1 / WR audit	C1 or WR occurrence	On Minebea request	at Supplier site

* Any VDA 6.3 process audit at Supplier have to be performed by VDA 6.3 certified Minebea auditors only.

** Self-assessment by the Supplier or the Sub-Supplier have to be performed with qualified assessors, including implementation of corrective actions as required. Minebea reserves the right to audit the process at the Sub-Supplier on its own initiative in case of major problem or risk.

** Below CQIs are applicable for the Yearly self-audit confirmation:

- CQI-9 Heat treatment System Assessment
- CQI-11 Plating System Assessment
- CQI-12 Coating System Assessment
- CQI-15 Welding System Assessment
- CQI-17 Soldering System Assessment
- CQI-23 Molding System Assessment
- CQI-27 Casting System Assessment
- CQI-29 Bar steel brazing System Assessment
- CQI-30 Rubber molding System Assessment

9. Change Management

The Supplier have to communicate to Minebea in a written form, any product or process change intention (design, manufacturing process, material, color ...) compare to approved Initial sampling prior to its implementation, in order to obtain a written approval from Minebea to proceed.

If a component which is a subject to a change is shipped to several Minebea sites – each of the sites shall be informed. Approval of planned change is then done centrally by Minebea.

Only after reception of a written agreement from Minebea, the Supplier is authorized to implement the change. This change will be managed/validated through a new PQA project according PQA process.

The PPAP process have to be applied always as:

- in the case of new items being supplied
- changes to items being supplied
- on instruction by Minebea
- Production relocation
- Production process modification
- Test process modification
- Long-term production stoppage – more than 12 months
- Use of new, modified or replacement tools
- Change of Tier 2 Supplier
- Modification in the Suppliers' purchased parts / material / stock
- Failed requalification and needed Product/Process change

The following chart lists some examples of product and process changes – this list is not exhaustive:

4M	Definition	Examples
Material	Changes on raw materials or subcomponent or raw material source	Material change from Polyamide to Polypropylene Packaging material from 3 ply cardboard to 2 plies Shape of packaging Labeling / marking Change Supplier or Sub-Supplier
Method	Manufacturing method or test / control methods change	Packaging operation conducted at end of line packaging operation moved to the warehouse Automatic process vs manual process Single component processing vs batch processing Temperature in heat treatment furnace Control frequency change from 100% to 5 parts at start of production, or vice versa
Machine	Changes on machines, gauges or tools used to produce or test/measure the components	Change layout of production line, but no change in equipment Stop supplying Minebea from a production site in France, and start supplying from a production site in China Purchase new press in order to increase capacity Renovation of old mold Purchase new test equipment
Man	Changes of the organizational workforce involved in the manufacturing process	Hoshin activity rebalance from 4 operators to 3 operators New shift has to be constituted at the supplier to extend capacity

Implementation of a Product or Process change by a Supplier without Minebea written agreement will be reported to Supplier's IATF or ISO9001 certification body by Minebea.

Supplier can be put in NBOH status due to Violation of trust.

10. End of Mass production lifetime

End of mass production life management cycle starts when the OEM production will be stopped and when OES production and Aftermarket remain still available.

All along the life of the component, Supplier shall ensure that its process is able to manufacture components according to approved Minebea specifications – latest PPAP. Whereas, the previous chapters of the manual deal with serial production, the purpose here is to define how Supplier make sure that the process is still capable when (and after) switching from mass production to end of life production.

- Evaluation of potential changes
 - 6 months before the departure point of the ‘End of Life’ period, the Supplier has the responsibility to fill-in the EMPL changes evaluation checklist. This document shall list any process changes that are planned to be executed by the Supplier before or while entering the ‘End of Life’ period.
 - This end of mass production life change evaluation checklist is then submitted by the Supplier to Minebea. The Supplier needs a formal approval from MINEBEA to launch changes as defined in the Product and Process change management section.
- Supplier self-process-assessment
 - One month before departure point of ‘End of Life’ period, the Supplier shall perform a self-assessment on its process through EMPL process assessment checklist.
 - The EMPL process assessment checklist with an updated PPAP shall be then submitted to Minebea for approval. The associated PQA shall be managed in accordance with PQA management rules.
- Once End of Life has been validated by Minebea, no more systematic yearly initial sample submission is then requested and no more systematic periodical Minebea process audit will be performed.
- Minebea process audits and initial sample submission will be nevertheless required following a product or process changes occurring at the Supplier.

11. Acronyms

Acronym	Definition
CAR	Corrective Action Report
CCL	Commodity Check List
CSL	Controlled shipping level 1 and 2. CSL1 and CSL2 are temporary sorting implemented with a view to guarantee certified deliveries while awaiting the reestablishment of the conformity of the production process.
CSR	Customer Specific Requirements (interpretations of or supplemental requirements from OEM linked to a specific clause(s) of the IATF 16949 QMS Standard)
EVAL	Supplier evaluation tool (audit) considering 8 key criteria concerning operational and strategic performances of the Suppliers. This grid is used to select as well as to evaluate potential Suppliers.
EPML	End of mass production lifetime
FDPR	Full day production run. Production run to validate the "full capacity / quoted rate" conditions.
FTA	Factor Three Analysis: Method to determine which factors influence the product/process and identify the root causes of an issue.
IMDS	International Material Data System
NBOH	New business on hold: Any supplier in NBOH cannot participate at MINEBEA RFQ process.
PDCA	PDCA (PLAN, DO, CHECK, ACT): is a methodology to settle and solve problems effectively based on continuous improvement. It contains four different steps: Plan: grasp the problem, analyze causes and effects and set objectives. Do: investigate solutions, identify the most effective one and implement it. Check: check the result in comparison to the objectives. Act: set a new standard and act to prevent the re-occurrence
PQA	Product Quality Assurance process for approval of product and process. Aim of PQA is provided Minebea with all the guarantees concerning the means to achieve product quality. PQA is a Advanced Quality planning tool of Minebea.
PSR / PCSR / PSO	Product Safety Representative or Product Safety and Compliance Representative (PSCR) or Product Safety Officer (PSO)
CP	Control Plan
QRQC	Quick response quality control. It is a way of management of problems applicable in every area: Production, Projects, Logistics, Purchasing...
RFMEA	Reverse FMEA. A Reverse PFMEA is an on-station review of all failure modes included in the PFMEA conducted by cross-functional team, focused to verify that all failure modes have their proper controls (prevention/detection) and they are working properly.
SPPC	Special product and process characteristics. Measurable characteristics of a component, System or assembly which may have an adverse or degrading effect on the function, quality or reliability if an out of tolerance condition occurs. Measurable elements of the process used to manufacture or assemble a component that have significant impact on the function, quality or reliability of that components.
TOOLING LOAN AGREEMENT	A document attesting to Minebea ownership when tooling has been placed at Supplier premises for the production of components.
TWS	Top Worst Supplier: program to improve the most impacting suppliers

12. SQA manual revision history

Rev.	Date	Description of change	Author
19	14-May-2024	Major update of documents in terms of: Minebea Customer specific requirements Tooling management Yearly requalification Capability study requirements Incident management ISR status and approval Supplier evaluation Audit scheduling Risk assessment	A.Gulyas
18	03-Aug-2022	Add requirements for warranty management	B.Heinrich
17	24-Jun-2021	Add normality of distribution as a pre-requisite for valid capability results + content revised in line with SPPC list I.10: Add Yearly IS submission II.4: Update of criteria for NBOH Alert & NBOH status II.6: Cascade to suppliers of applicable OEM CSR (i.e. PSB role, AIAG CQI requirements) Appendix list removed	B.Heinrich
16	15-Jul-2020	content aligned according to the last SPPC list template II.2: change of the claim weight for C2 incident in Supplier ranking calculation	B.Heinrich
15	09-Jan-2019	Add of RFMEA after a C1/Recurrent incident II.3: Add of RFMEA requirement II.4: Add of Logistic TWS program II.4: Update of NBOH Logistic condition II.6: Update of preventive audit frequencies V: Add of RFMEA definition	G. SCHMUCK
14	06-Jul-2018	Major update of the document: Supplier Ranking, Fire Wall, supplier KPI, PSW use, PUMA 2.0 and PQA Scenarios, claim management update (8D use and lead-time to answer), Capability target adjustment, IATF alignment, preventive audits and simplification of the document – All Sections updated	G. SCHMUCK
13	17-Feb-2016	Add Author & Manual Revision History – section VII	B.Heinrich
12	12-Nov-2013	Integration of Minebea PUMA Portal – section II.1	B.Heinrich

	Created by	Verification	Approval
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Title	SQA Manager	Head of SQA	Head of Purchasing
Date	13/May/2024	20/May/2024	20/May/2024