



Global Supplier Quality Manual



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1.0 Forward

Suppliers are an intrinsic part of our business. Our aim is to work in partnership to achieve our quality objectives and to help both the Supplier and EnerSys be successful.

Zero defects and zero tolerance of non-quality are the EnerSys Quality objectives for the satisfaction of EnerSys customers. It is customers who determine our future.

2.0 Purpose

This Supplier Quality Manual (SQM) has been created to assist our Suppliers in understanding EnerSys' quality requirements.

These requirements extend from Supplier qualification through new product development to serial production and are applicable for all categories of EnerSys Suppliers delivering production parts and components on the global, regional, and local levels.

Upon acknowledgement and acceptance of this document, compliance with the content is always required by the Supplier. The Supplier warrants and confirms that fulfilment of all EnerSys quality requirements is essential for delivery of products to EnerSys and its customers.

The Supplier Quality Management Agreement (SQMA) formalizes the Supplier agreement to the current version of this manual.

Any exception or deviation to the requirements, terms, and conditions of the Supplier Quality Manual, including, but not limited to exceptions or deviations to EnerSys' expectations, requires EnerSys' prior written approval via The Supplier Protocol (see Appendix 1).

All products and materials supplied must correspond with all valid, applicable, legal, safety, and statutory regulations. This includes all laws, regulations, and standards enforced concerning health, safety, and environmental protection, specific to each of the countries where the parts are manufactured, as well as EnerSys' requirements for Supplier (Supplier Code of Conduct), stakeholders (Code of Business Conduct and Ethics) and environmentally sustainable responsible procurement (Corporate Social Responsibility), all of which are available on our website at www.enersys.com. Every aspect of the component or assembly or material delivered to EnerSys, including sub-supplier components, raw materials, lubricants, coatings, paint, and chemical constituents, must be considered.

If the Supplier places orders with sub-suppliers, the Supplier is obligated to impose the requirements of this SQM on its sub-suppliers. Supplier shall be fully responsible for all its sub-suppliers, including their acts and/or omissions. The same rules imposed by EnerSys apply to any sub-supplier, unless otherwise specified.

The Supplier is permitted to use their own forms/templates for any document not specified in this SQM.

Upon any new revision or release of this manual, the current revision becomes obsolete and the latest revision takes full precedence.

The new revision will be presented to the Supplier for acknowledgment and written acceptance.

3.0 Advanced Product Quality Planning (APQP).

Advanced Product Quality Planning (APQP) is a structured method of defining and establishing the necessary steps are followed, and all rules are implemented to ensure components delivered by Supplier will comply with EnerSys' requirements.

The APQP procedure is applicable for all EnerSys Suppliers delivering production components at the global, regional, and local levels.

The APQP procedure includes 7 stages in total, starting from Stage 0 till Stage 6. These stages apply to all customer application projects and to components already used in production (product / process changes).

APQP						
STAGE 0	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	STAGE 6
Supplier Selection	Supplier Nomination	Supplier Manufacturing Feasibility Confirmation	Supplier Process Validation	PPAP Submission	Start of Production and Probationary Period	Product Quality Assurance (PQA) Management
SUPPORT: Appx 18 Supplier Advanced Product Quality Planning Guideline						

3.1. Stage 0: Supplier Selection

3.1.1. The purpose of this stage is to validate whether the performance of a potential Supplier complies with EnerSys' requirements. This validation is based on the following.

The Supplier must:

- Have a clearly defined quality policy
- Be an organization capable of assuring quality at all stages of the component life
- Be willing to work with EnerSys in a spirit of partnership, problem solving and continuous improvement
- Guarantee the reliability of processes and keep records
- Maintain a process of continuous improvement
- Maintain a process to continuously capture what has been learned

3.1.2. A Supplier intending to be part of EnerSys Approved Vendor List (AVL) should meet the following conditions:

- Valid ISO 9001 certification (latest revision) obtained through an accredited certification body.
Existing Suppliers without ISO 9001 certification should have a planned date of certification confirmed.
- Completed Risk-assessment based on the Risk Assessment Questionnaire delivered to EnerSys for verification and Continuity for Business Checklist.
Note: The purpose of the risk-assessment is to identify all process management related risks at the potential Supplier's side.

- Compliance with EnerSys requirements as presented in the Supplier Quality Manual.
- Compliance with the EnerSys Supplier Code of Conduct (available at <https://www.enersys.com/en/about-us/suppliers/>) which includes our Code of Business Conduct and Ethics, anti-slavery and human trafficking statement, conflict minerals, environmental and climate change policies, workplace labor rights policy, among others.
- Compliance with our Corporate Social Responsibility & Human Rights Policy (available at <https://www.enersys.com/en/about-us/csr/>) along with our similar policies covering a commitment to sustainable, environmentally responsible and ethical procurement.
- Valid certification for specific business requirements, e.g. rail, aviation, nuclear, military, welding, IATF16949, AS9000, UL, ISOTS22163, etc.
- The Supplier must present certificates to EnerSys each time a new certification or recertification is completed.

3.1.3. Stage 0 Deliverables

STAGE 0 DELIVERABLES		
ENERSYS	SUPPLIER	SUPPORT
Risk Assessment Evaluation	Risk Assessment Data delivery	Appx 3 Supplier Risk Assessment Questionnaire Appx 17 Checklist for Business Continuity Example
Certification/Business Specific Requirements	Certificates and other evidence requested	Appx 3 Supplier Risk Assessment Questionnaire
Environmental / Safety / Legal Requirements	Certificates and other evidence requested	Appx 3 Supplier Risk Assessment Questionnaire
SQM Presentation	SQMA signature	Appx 4 Supplier Quality Management Agreement Appx 1 Supplier Protocol
Output of Stage 0		
<ul style="list-style-type: none"> • SQMA signed • Initial sourcing decision 		

3.2. Stage 1: Supplier Nomination

3.2.1. The purpose of this stage is to define EnerSys requirements specific for components/products that shall be addressed with the Supplier. This creates the foundation for the rest of the stages that follow.

Unless otherwise specified in a master purchase agreement or in signed, written terms agreed upon between the Supplier and EnerSys, all purchases will be covered by the applicable terms and conditions available at: <http://terms.enersys.com/>

To adequately specify the component requirements to its Suppliers, EnerSys will define the Supplier Component Review File, which includes:

- Component/product specifications: set of functional, technical, and general specifications and drawings
- Logistic and packaging requirements
- Quality requirements
- Applicable terms and conditions
- Milestones and review timelines
- Initial manufacturing feasibility

In addition, PPAP Level Requirements a List of Characteristics for Control will be presented to the Supplier.

3.2.2. Stage 1 Deliverables

STAGE 1 DELIVERABLES		
ENERSYS	SUPPLIER	SUPPORT
Specific Requirements for component/project	Specific requirements verification and initial answer	Appx 2 Supplier Component Review File
PPAP Level Requirements	Verification and initial answer	Appx 6 PPAP Requirements and Check List
List of Characteristics for Control	Verification and initial answer	Appx 5 List of Characteristics for Control
Output of Stage 1		
<ul style="list-style-type: none"> • Request for quotation (RFQ) • Final sourcing decision • Kick off meeting with chosen Supplier 		

3.3. Stage 2: Supplier Manufacturing Feasibility Confirmation

3.3.1. The purpose of this phase is to review and approve chosen Supplier deliverables, in line with Stage1 requirements, to ensure product and process expectations are achieved to ensure the robustness with regards to the Supplier manufacturing constraints, the EnerSys and Customer interfaces, and prepare the tool launch.

3.3.2. Supplier Manufacturing Feasibility Confirmation is followed by:

- Product and Process Feasibility Confirmation with agreed changes
- Updated List of Characteristics for Control agreed and signed by EnerSys and the Supplier – an alignment done for control methods including control equipment, specific measurement locations, frequency, etc. (this is an input to PFMEA, control plan and work instructions).
- PPAP documents initial presentation – Flow Chart, FMEA, and Control Plan (process parameters that may have a detrimental effect on product characteristics must also be considered during this stage, e.g. during welding or injection molding)
- Traceability and coding system confirmation
- Tier 2 Suppliers mapping – a list of sub-suppliers for components, processes, and raw materials including backup sub-suppliers
- Contingency plans from Supplier
- Pre-production part approval made internally by the Supplier and EnerSys

3.3.3. EnerSys should evaluate Supplier provided pre-production part to verify if parts meet design criteria. Results of pre-production part validation should be presented to the Supplier. This is not an approval of the component. Approval of the component will be given after PPAP approval.

Best practice is to produce pre-production part using similar tools/processes that will be used for the final pre-production part.

3.3.4. Stage 2 Deliverables

STAGE 2 DELIVERABLES		
SUPPLIER	ENERSYS	SUPPORT
Product and process feasibility confirmation with agreed changes	Approval	Appx 2 Supplier Component Review File
PPAP initial presentation (Flow Chart, FMEA, Control Plan)	Verification and initial answer	Appx 8 PPAP Template Example
List of Characteristics for Control	Verification and final approval	Appx 5 List of Characteristics for Control
List of components and raw material suppliers with back up suppliers	Verification and approval	
Contingency plans	Verification and approval	
Other specific component requirements	Verification and approval	Appx 2 Supplier Component Review File
Pre-production part production and internal validation	Verification and approval	Appx 8 PPAP Template Example
Output of Stage 2		
<ul style="list-style-type: none"> • Manufacturing feasibility frozen • Pre-production part validated 		

3.4. Stage 3: Supplier Process Validation

3.4.1. The purpose of this stage is to ensure that the process developed by the Supplier is capable of producing components in compliance with EnerSys' requirements. It is followed by:

- Process Audit and capacity confirmation. Ensuring committed capacity during all operations
- Capability of the process confirmation (SPC)
- Component produced. Conforming to EnerSys requirements (First off Tool Article)

3.4.2. Process Audit and Capacity Confirmation

The Supplier shall perform an internal process audit prior to EnerSys' process validation and shall confirm capacity of the process including:

- Quantity of produced part/time (hour/shift)
- Rejects (ppm)
- Number of operators trained
- Sub-supplier (tier 2) capacity confirmation
- Bottle neck
- Details of nonconformities, line stoppage, root causes, and actions taken to improve

Reports from Internal Process Audit should be presented to EnerSys.

EnerSys reserves the right to perform on-site process audits and capacity verification for any component with requested PPAP.

The above required process audits and capacity confirmation shall be documented by the Supplier and by EnerSys via the Process Audit Questionnaire.

The Supplier must develop an action plan for each non-conformity identified during the audit. If the process is not validated or conditionally validated, a follow-up audit will be requested.

The audit is valid only if the process audited is the same one used in mass production, including equipment and conditions.

All documents necessary for production shall be available during EnerSys audits, including control plans, work instructions, and records of control.

3.4.3. First-off Tool Article

- The purpose of the First off Tool Article validation is to confirm a component complies with EnerSys' requirements and the process developed by the Supplier is capable of producing the defined components in compliance with EnerSys' requirements.
- The component produced from the First off Tool must be evaluated and approved by Supplier and EnerSys in terms of dimension and assembly.
- In the case of several tools, molds, stamps, or processes (e.g. production lines or cells) the Supplier is requested to deliver a First off Tool Article, dimensional results, capability studies, and other requested documents per tool, mold, stamp, or process.
- For multi-cavity tooling, the Supplier must submit a separate First off Tool Article and dimensional results, capability studies, and other requested documents for each cavity.
- The First off Tool Article may be taken only if the process is validated by the Supplier.
- If First off Tool Article is approved at this stage, it is not a final approval. The final approval will be given after PPAP submission.

3.4.4. Capability of The Process

- A process capability analysis must be undertaken for characteristics agreed to with EnerSys that are critical to the safety, functionality, or process (**indicated as critical or significant**).
- Each critical or **significant** characteristic will require a capability study performed on at least 30 components (50 pcs for electronics).
- The results will lead to confirmation of a statistically normal distribution of the process followed parameters with a process capability:

Customer Defined Special Characteristics Ppk 1.67 min; Cpk 1.33 min, or as defined by Customer

Critical & Significant Characteristics Ppk 1.67 min; Cpk 1.33 min

Other Characteristics (if required) Ppk 1.33 min; Cpk 1.33 min.

- If capability is not demonstrated, Supplier must adapt a specific control plan, including Poka Yoke, 100% control, or testing to demonstrate its ability to conform to characteristics under control. All controls must be documented.
- For MSA, Gauge R&R acceptable level is <30%.
- Each critical and **significant** characteristic must be monitored through SPC when component will be used in serial production.
- For any additional information AIAG standards are to be considered as guidelines.

3.4.5. Stage 3 Deliverables

STAGE 3 DELIVERABLES		
SUPPLIER	ENERSYS	SUPPORT
Process data sheets, work instructions, operator training records preparation		
Internal process and capacity validation	Verification and initial answer	Appx 7 Process Audit Questionnaire.
Documents Update (Flow Chart, FMEA, Control Plan, Work, and Inspection instruction)	Verification and final approval	Appx 8 PPAP Template Example
First off Tool Internal approval including initial capability study and MSA study	Verification and approval	Appx 8 PPAP Template Example
First off Tool presentation to EnerSys with full dimensional report, initial capability study and MSA study	Verification and approval	Appx 8 PPAP Template Example
	Process Audit and Capacity Confirmation, ACAR issue if non-conformities	Appx 7 Process Audit Questionnaire.
ACAR	Follow up audit	Appx 7 Process Audit Questionnaire.
Output of Stage 3		
<ul style="list-style-type: none"> • First off Tool Article approved • Process validated 		

3.5. Stage 4: PPAP submission

3.5.1. The purpose of the Production Part Approval Process (PPAP) submission stage is to provide evidence that established manufacturing process has the potential to produce a part that consistently meets all requirements during the actual production run at the quoted production rate. There are five levels of approval.

3.5.2. PPAP Possible Levels

- Level 1 - Warrant only submitted to the customer.
- Level 2 - Warrant with product samples and limited supporting data submitted to the customer (e.g. engineering changes).
- Level 3 - Warrant with product samples and complete supporting data submitted to the customer.
- Level 4 - Warrant and other requirements as defined by the customer.
- Level 5 – Warrant with product initial samples and complete supporting data available for review at the Supplier's.

3.5.3. EnerSys determines the PPAP level required for all components, PPAP Level 3 submission is the EnerSys standard unless otherwise specified.

These may include components that in the event of:

- non-compliance will influence final customer acceptance of the product
- non-compliance will influence the whole production process or a significant part of the production process
- non-compliance will have an impact on safety
- the component is for restricted application with specific requirements (e.g. automotive, nuclear, government, military, aviation)

EnerSys determines which items require a PPAP Level 4.

Minimum to be delivered is: Part Submission Warrant (PSW), dimensional report, material certificate, and physical parts.

3.5.4. PPAP Submission Requirements:

PPAP SUBMISSION REQUIREMENTS						
ITEM	REQUIREMENT	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
1.	Design Records	R	S	S	*	R
2.	Engineering Change Documents, if any	R	S	S	*	R
3.	Customer Engineering Approval, if required	R	R	S	*	R
4.	Design FMEA, if required	R	R	R	*	R
5.	Process Flow Diagrams	R	R	S	*	R
6.	Process FMEA	R	R	R	*	R
7.	Dimensional Report	R	S	S	S	R
8.	Material Performance Test Result	R	S	S	S	R
9.	Initial Process Capability Study (SPC)	R	R	S	*	R
10.	Measurement System Analysis (MSA)	R	R	S	*	R
11.	Qualified Laboratory Documentation	R	S	S	*	R
12.	Control Plan	R	R	S	*	R
13.	Part Submission Warrant (PSW)	S	S	S	S	R
14.	Appearance Approval Report, if applicable	S	S	S	*	R
15.	Product Samples	R	S	S	S	R
16.	Master Sample	R	R	R	*	R
17.	Checking Aids	R	R	R	*	R
18.	Records of Compliance with Specific Requirements, if applicable	R	R	S	*	R
19.	Ballooned Part Drawing	R	S	S	S	R
20.	Other (e.g. Packaging Instruction)	R	S	S	*	R

S = the Supplier shall submit to EnerSys product approval activity and retain a copy of records or documentation items at appropriate locations, including manufacturing

R = the Supplier shall retain at appropriate locations, including manufacturing, to make readily available to EnerSys representative upon request.

* = the Supplier shall retain at appropriate locations and submit to EnerSys upon request.

The Supplier is permitted to deliver PPAP using their own documents or EnerSys PPAP documents example.

3.5.5. PPAP Status

- Approved - Components meet all requirements.
- Conditional Approval - Permits a supply of components as required per production for a restricted time or quantity. Conditional Approval is a temporary solution valid only if Supplier has clearly identified root cause of non-conformity preventing production approval and created an action plan agreed upon with EnerSys. A further PPAP shall be submitted to achieve "approved" status.
- Rejected –Submitted components and /or accompanying documents do not meet requirements. Corrected products and documentation shall be submitted and approved before production quantities may be shipped.

3.5.6. PPAP Stage Generic Statements

- Based on customer requirements PPAP Submission may be requested by EnerSys at any time without added cost.
- All requested documentation must be updated and valid.
- It is forbidden for the Supplier to send production quantities to EnerSys without having received PSW report completed by EnerSys stating the status of the product is accepted.
- EnerSys disclaims responsibility for any parts shipped prior to PPAP approval.
- Serial production articles must comply with PPAP approved by EnerSys: no change on product (finished part, sub-component, or raw material), neither on process nor on packaging.
- PPAP approved by one EnerSys location shall be valid for other locations if no specific requirements.

3.5.7. Stage 4 Deliverables

STAGE 4 DELIVERABLES		
SUPPLIER	ENERSYS	SUPPORT
PPAP batch production and delivery	Approval	Appx 6 PPAP Requirements and Check List
PPAP documents delivery	Approval	Appx 8 PPAP Template Example
Output of Stage 4 <ul style="list-style-type: none"> Component validated for serial production All ACARs closed 		

3.6. Stage 5: Start of Production and Probationary Period

3.6.1. Upon EnerSys' acceptance of PPAP the Supplier can deliver components according to the established needs and logistics orders.

Serial production and requirements:

- The Supplier is fully responsible to deliver according to the specifications and in line with the accepted PPAP.
- It is the Supplier's responsibility to deliver production conformance to all applicable requirements. Delivered products are not subject to incoming control at EnerSys or incoming control may be done in limited scope according to internal EnerSys requirements.
- The Supplier is obligated to follow approved control plans during the production and document the results.
- Process interruptions (e.g. tool breakage) and quality-control measures must be clearly traceable with these records.
- A production batch is released categorically only if no faulty product was found during regular control and testing. If a product defect is noted during the production process, the Supplier must interrupt the process immediately and correct it. In this case, all products manufactured since the last positive testing (last good part) must be checked 100%. Defective products must be secured immediately and stored in a safe location ("blocked warehouse") until final clarification of the source of the defect. Corrective measures must be documented in the records.
- Should a subsequent test show the defective products cannot be reworked, they must be scrapped. In the case of reworking, all stipulated series tests must be implemented. If the Supplier is unable to supply products according to the specification, they must obtain a written release from EnerSys before delivery.
- The Supplier undertakes to ensure the traceability of the products it delivers. If a defect is determined, the containment of the faulty parts/products/batches must be ensured.
- The Supplier undertakes to label products, parts, and packaging in accordance with the agreements made with EnerSys. It must be ensured that the labels of the packaged products are legible during transportation and storage.

- EnerSys expects the Supplier to continually improve the processes both under economic considerations and with the goal of minimizing defects.
- If EnerSys and its sub-suppliers provide production and test instruments to the Supplier, in particular instruments and appliances within the context of the procurement of deliveries, the Supplier shall treat these in terms of care and maintenance as if they were the Supplier's own test instruments.

3.6.2. Deviation/Concession

In the event of a deviation/concession is required for the components, the Supplier will remain responsible for the quality of the components delivered and will raise a deviation request to EnerSys using the Supplier Deviation/Concession Request.

Any deviation shall be subject to EnerSys' verification at EnerSys' sole discretion. Even in the case of an accepted deviation, EnerSys reserves full rights to dispute and/or challenge any deviations or non-conformities.

Deviations shall be approved for a specific period or a quantity of parts. No permanent deviations are permitted.

3.6.3. Probationary Period Rules

- EnerSys' probationary period should include defined number of production batches from the Supplier (minimum 2 batches should be considered).
- During the probationary period the Supplier is required to deliver components together with a certificate of conformity dimensional results. Supplier must confirm conformity of all characteristics included in the List of Characteristics for Control.
- EnerSys' Incoming Control will verify certificates by random check. If the product conforms (no non-conformity found), Product Quality Assurance (PQA) status is automatically granted. There will be no additional incoming control at EnerSys unless PQA status is lost.
- Certificates of conformity shall be available at Supplier and presented to EnerSys upon request. If conformity of product not achieved, PQA status will not be granted, probationary period will continue, and could be reinforced by CSL procedure (see chapter 5.2 Supplier Performance Monitoring) until conditions are achieved.
- Each non-conformity detected during incoming control, production or by EnerSys customers, will be communicated to the Supplier as a Supplier Incident Notification (see 5.1 Incident Processing).
- The probationary period cannot be completed until corrective actions are approved by EnerSys Quality.
- A group of components that, due to potential impact for production process and or safety, are continuously monitored during incoming control and a certificate of conformity is requested with each delivery, e.g. lead, acid.

3.6.4. Stage 5 Deliverables

STAGE 5 DELIVERABLES		
SUPPLIER	ENERSYS	SUPPORT
Produce components in line with approved PPAP		Appx 8 PPAP Template Example
Delivery of components according to orders with Quality Certificates (Dimensional Reports)	Random Verification and Approval	Appx 5 List of Characteristics for Control Appx 8 PPAP Template Example (dimensional report)
Deviation Request	Approval	Appx 10 Supplier Deviation Request
	Supplier Quality Incident Notification	Appx 11 Supplier 8D Report
For any Supplier Incident Notification: answer using 8D methodology	Approval	Appx 11 Supplier 8D Report
Output of Stage 5		
<ul style="list-style-type: none"> Product Quality Assurance Status Granted 		

3.7. Stage 6: Product Quality Assurance (PQA) Management

3.7.1. When a component is granted the Product Quality Assurance (PQA) status, the component is no longer subject to incoming control or incoming control is limited.

Upon request, the Supplier shall inform EnerSys of the results of the inspections carried out for each delivery and present quality certificate.

3.7.2. PQA Status Loss

- Non-conformity detected. PQA status will be lost if any non-conformity of component is detected in EnerSys production process or by customer. Supplier will receive complaint notification.
- In the event of a of quality incident, the component reverts to the probationary period.
- Deviation requested. PQA status is lost, and component reverts to the probationary period.
- No product deliveries for more than 2 years. PQA status is lost, and new PPAP submission requested.
- Product or process changes. In case of a product or process change – the PQA status is lost and will need to be granted through the development stages of the APQP as decided by EnerSys Supplier Quality.
- Examples of changes which generate removal of PQA status (the list is not exhaustive):
 - Material changes: Changes made to the components or raw materials or to the component or raw material source. Examples include, but are not limited to, material change from X to Y, packaging material change from 3-ply cardboard to 2-ply, shape of packaging change, label change, change Supplier or sub-supplier, etc.

- Method changes: Changes to how components are produced, tested, or controlled. Examples include, but are not limited to, packaging, operation moved from line to storehouse, automatic process changed for manual one, process parameters change temperature, pressure, control frequency change, etc.
- Machine changes: Changes made in the machines, gauges or tools used to produce, test or control components. Examples include, but are not limited to, procurement of new equipment in order to increase capacity, renovation/modification of old equipment (press, mold), procurement of new test equipment, transfer or extension of production from X factory to Y factory or transfer or extension of production from X country to Y country.

EnerSys requires notification and written approval of any proposed changes before implementing such changes- Supplier Change Request.

3.7.3. Stage 6 Deliverables

STAGE 6 DELIVERABLES		
SUPPLIER	ENERSYS	SUPPORT
Produce components in line with approved PPAP		Appx 8 PPAP Template Example
Delivery of components according to orders with Quality Certificates upon request (Dimensional Reports)	Random Verification	Appx 5 List of Characteristics for Control Appx 8 PPAP Template Example (dimensional report)
Deviation Request	Approval	Appx 10 Supplier Deviation Request
Change Request	Approval	Appx 9 Supplier Change Request Appx 16 Transfer Check List
	Supplier Quality Incident Notification	Appx 11 Supplier 8D Report
For any Supplier Incident Notification: answer using 8D methodology	Approval	Appx 11 Supplier 8D Report
Output of Stage 6		
<ul style="list-style-type: none"> • Product Quality Assurance Status Maintained 		

4.0 Quality Improvement

To achieve the EnerSys quality Zero Defects objective, the Supplier must define and deploy a Quality Improvement Plan (QIP) based on a continuous improvement strategy and PDCA methodology:

This plan will focus on:

- **Risk assessment**
- **Preventive quality**
- Elimination of root cause issues
- Learning from mistakes

4.1. Incident Processing

4.1.1. For each component that does not conform to the requirements, a Supplier Quality Incident notification via Supplier 8D Report will be generated including:

- Problem description 5W2H methodology
- Good and bad part/situation comparison (photo, specification...)
- Traceability data
- Incident category

Supplier must use the 8D methodology exclusively for incident processing/treatment to be consistent. An 8D report is required for each non-conformity notification. Deadline for completion is defined as below starting from the notification date:

D3 - immediate countermeasures to secure EnerSys and Customer: 24 hours

D5 - root cause analysis & corrective action plan: 5 working days

D7 – prevention & standardization plan: 10 working days

D8 – action closure, final verification, team recognition: 30 working days (30 days is a recommendation, however key criterium to close 8D is corrective and preventive actions closure including effectiveness confirmation).

Supplier Quality Incidents are registered by Site Quality Department. The Site Quality Department is responsible for containment actions approval. The Regional Supplier Quality is responsible for corrective actions approval and incident closure. Effectiveness of actions shall be confirmed by Supplier and Site Quality, prior incident closure.

In the event of a of quality incident, the component reverts to the probationary period.

4.1.2. Categories of Supplier Quality Incidents are defined as below:

CATEGORIES OF SUPPLIER QUALITY INCIDENTS	
CATEGORY	DESCRIPTION
C1	Any complaint from external customer or end-user that is caused by component delivered by Supplier, detected before or during assembly by the customer. Detection – customer

C1WR	Any complaint from external customer where reject occurring during usage “in the field” and is caused by a non-conformity of a component delivered by a Supplier. Detection – customer
C2	Any component delivered by Supplier and rejected during EnerSys production process. Detection – production process by EnerSys
C3	Any component delivered by Supplier and rejected during EnerSys incoming control. Detection – incoming control by EnerSys
C4	Any non-conformity detected during development before PPAP is approved. A non-conformity represents a failure to meet an intended state and specification.

4.1.3. Recurrent Incidents

Any C1, C1WR, C2 and C3, C4 will be reported as a recurrent Incident if it occurs in the same component or component family, the same failure mode, and the same reason (suspected root cause or identified root cause) and for which production date is after implemented action plan.

Component family – components manufactured for EnerSys by the same Supplier, achieving the same technical function, and which follow the same flow using the same specific tooling.

Potential reasons for a recurrent incident:

Containment was not effective

Root cause was not properly identified

Action plan on root cause was not effective for occurrence and /or detection

Supplier must perform cross reference between similar processes (even if not supplied to EnerSys) to understand the correct root cause can be implemented and addressed.

4.1.4. Logistic Incidents

Separate from Quality incidents, Logistic incidents may occur. Management of logistic incidents are the responsibility of the Logistic/Supply Chain department.

A logistics incident is defined as an incident which creates logistic perturbation (delay, shortage of part deliveries, shutdown), for the customer or EnerSys, including parts received that are not compliant with the order, not compliant with delivery window, errors on delivery documents or missing documents, damaged delivery/pallets.

4.1.5. Cost Management

The Supplier is responsible for any non-conforming material costs and any additional costs that arise as a result of poor quality or non-conformance. Specifically, the Supplier may be liable for a charge-back for Supplier-caused nonconforming material, products (including final finish goods), or a service which could include, but is not limited to, actual or estimated rework, sorting or scrapping costs.

There may be instances when additional charges may be charged to the Supplier for business interruptions. There may be times when EnerSys or customer requirements necessitate further charge-back costs, including, but not limited to, special release costs, administrative fees, testing expenses, logistic expenses, quality audit charges, and sorting or rework costs incurred by EnerSys through a third-party.

4.1.6. Incident Processing Deliverables

INCIDENT PROCESSING DELIVERABLES		
ENERSYS	SUPPLIER	SUPPORT
Supplier Quality Incident Notification Supplier Answer Approval	Answer (Root Cause Analysis, Containment, Corrective and Preventive Actions)	Appx 11 Supplier 8D Report
Cost Charge Back	Payment	Appx 11 Supplier 8D Report (Cost Collection Sheet)
Output		
<ul style="list-style-type: none"> All non-conformities resolved No recurrent issues 		

4.2. Supplier Performance Monitoring

Supplier Key Process Indicators (KPI) are measured based on quality and delivery performance.

4.2.1. Quality performances will be measured for each Supplier based on the following indicators.

- Supplier Quality Reject Rate (SQRR). In alignment with EnerSys' zero defects policy, the objective of SQRR is zero ppm.
- SQRR is calculated for each Supplier by expressing the ratio of rejected quantity received, divided by total quantity received for the time period, and expressed as a ppm (calculation method below).

$$\text{(ppm) SQRR} = \frac{\text{Total Rejected Quantity} \times 1000000}{\text{Total Received Quantity}}$$

- Number of C1, C2, C3, incidents and the sum of all incidents (C1+C2+C3)
- Number of C1WR
- Number of recurrent incidents

4.2.2. Additional quality indicators monitored are as follows:

- Percentage of reactivity (answering time respected)
- Number of C4 incidents

4.2.3. Delivery performances are monitored and communicated by Procurement/Purchasing

- On-time delivery (OTD) is calculated for each Supplier by expressing the ratio of On-Time quantity received, divided by the total quantity received for the time period, expressed as a percentage.

$$\% \text{ OTD} = \frac{\text{Total On-Time Volume} \times 100}{\text{Total Volume}}$$

- Delivery timeframe: -1 day early / +1 day late = On-Time
- Calculation based on business days (3 days added in case of delivery date on Friday to consider delivery on Monday as on time – only for late deliveries)
- Reporting based on fiscal dates to match earning periods
- Partial delivery of purchase order (PO) line is counted as on time, and the remaining amount will be qualified as late in the next report.

EnerSys requires all Suppliers to provide 100% on-time delivery performance with the correct quantity and pricing as agreed upon.

INDICATOR	GENERIC OBJECTIVE	COMMENTS
SQRR	0 ppm	Specific target will be decided per Supplier based on results
C1	0 incidents	
C1WR	0 incidents	
C2/C3	0 incidents	Specific target will be decided per Supplier based on results
Recurrent Incidents	0 incidents	
C4	0 incidents	
Reactivity	100% on time	Specific target will be decided per Supplier based on results
OTD	100% on time	Specific target will be decided per Supplier based on results

4.2.4. Supplier Quality and Delivery Performance Management

- On a monthly basis, EnerSys Supplier Quality should distribute a Supplier Performance Report to Supplier.
- The Supplier will analyze these facts and data to define and implement a Quality Improvement Plan (QIP) to support a continuous improvement strategy. Suppliers must present QIPs to EnerSys upon request.
- Based on the results of Supplier Performance Reports have the scores have four possible levels.

LEVEL	SCORING %	ACTION
Good	100 - 91	To maintain
Capable	90 - 81	Analysis and Quality Improvement Plan done internally by Supplier
Conditional	80 - 70	Quality Improvement Plan presented to EnerSys
Unacceptable	<70	Reinforced Quality Improvement Plan presented to EnerSys, Controlled Shipment Level Procedure

4.2.5. GPS (Group Priority Suppliers)

Any Supplier with an Unacceptable scoring level must demonstrate improvement over a period of three months, or the Supplier will be assigned to the unsatisfactory Suppliers’ group – GPS (Group Priority Suppliers) and written notification will be given to such Supplier.

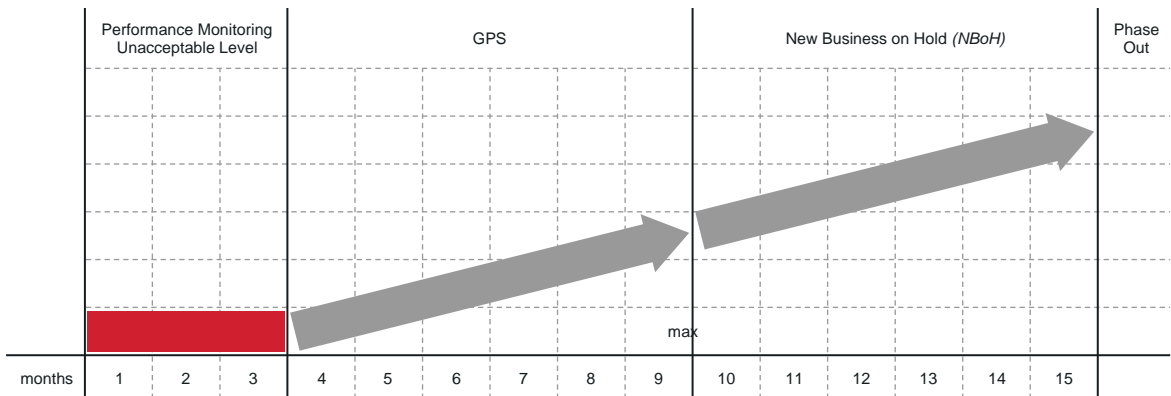
Any Supplier with a Conditional scoring level must demonstrate improvement over a period of six months, or the Supplier will be assigned to the unsatisfactory Suppliers’ group – GPS (Group Priority Suppliers) and written notification will be given to such Supplier.

EnerSys’ aims to support our Suppliers. The EnerSys GPS program supports GPS Suppliers toward to goal achievement. The program includes:

- Supplier visit at EnerSys and presentation of Quality Improvement Plan to EnerSys Management
- Regular review of QIP until all actions are closed and goal achieved
- Process Audit for components that impacted goals
- CSL procedure for components that impacted goals

The exit of the GPS Program will be decided by EnerSys upon satisfactory achievement of the targets agreed upon at the initiation of the program with the Supplier.

If the Supplier repeatedly fails to achieve EnerSys targets or is not demonstrating commitment to continuous improvement of quality after six months, EnerSys may decide to stop consulting the Supplier for new business opportunities or a phase-out scenario may be initiated to stop any business with the Supplier.



4.2.6. Controlled Shipment Level (CSL)

The CSL procedure includes CSL1 and CSL 2 options as described below.

- CSL1 – Following a request from EnerSys, the Supplier will implement a CSL1 in addition to the sorting activity within production.
- The CSL1 and the sorting activity will be operated in a dedicated zone, and in accordance with a specific control instruction approved by EnerSys. The Supplier will provide evidence that sorting operators have been trained to complete the sorting activities and the CSL1 Instructions. The performance of the sorting activity will be monitored daily by the Supplier.
- The Supplier formally guarantees the conformance of goods delivered for each delivery that takes place while CSL1 is in the process by placing a CSL1 label on each box. CSL1 records and reports will be made available to EnerSys upon request
- The cost of sorting will be absorbed by the Supplier.
- After a three-month period, if the Supplier fails to meet the commitments as stipulated in CSL1, then CSL2 must be implemented.
- CSL2 – the Supplier is required implement a sorting activity by an external company approved by EnerSys, in adherence with criteria as defined in CSL1. The cost of sorting will be absorbed by the Supplier. The external company will communicate the sorting results to both EnerSys and the Supplier. CSL2 label shall be present on each box. CSL2 period should not exceed three months.

4.2.7. In addition to GPS program, EnerSys reserves the right to request the Controlled Shipment Level procedure from the Supplier when results are unsatisfactory (stable or increasing quantity of incidents, recurrent incidents, no 8D) in order to assure certified deliveries while awaiting the full recovery of the conformance of the production process and/or the product.

EnerSys reserves the right to initiate additional charges for nonconformities detected by EnerSys or the EnerSys customer after implementation of the CSL procedure.

4.2.8. Based on quality, delivery and other key criteria, EnerSys will select the Top Suppliers, and grant them an official Distinguished Supplier Recognition.

4.2.9. Supplier Performance Monitoring Deliverables

SUPPLIER PERFORMANCE MONITORING DELIVERABLES		
ENERSYS	SUPPLIER	SUPPORT
Supplier KPI Collection and Presentation to Supplier	Quality Improvement Plan	Appx 13 Supplier Performance Report
Appx 12 PPM calculation Method		
GPS Program	GPS Activities	Appx 14 GPS Nomination/Exit
Output of Supplier Performance Monitoring		
<ul style="list-style-type: none"> • Supplier performance under control 		

4.3. Auditing

4.3.1. Audit Levels and General Rules

During serial production, Supplier sites should be re-evaluated by EnerSys on a regular basis using various levels of audits.

- Risk Assessment Audit - EnerSys reserves the right to request this audit every two years and in the case of any change which may impact EnerSys business.
- Process Audit - EnerSys reserves the right to perform this audit every two years, however final decision is at the discretion of the EnerSys Supplier Quality department. If quality and delivery performance meet the requested level, periodical audits may be suspended. EnerSys reserves the right to perform this audit in the following situations: after each C1 and C1WR incident, increasing or stable level of C2 and C3, any recurrent incident, and for Suppliers entering the GPS Program.
- If the process is conditionally validated or not validated, a follow-up audit will be requested.
- Product Audit EnerSys – On an annual basis, EnerSys reserves the right to request an audit on any component delivered by Supplier. Product Audit reports shall include results of dimensional control for all characteristics from the drawing (dimensions, aspect, testing etc.)

EnerSys reserves the right to confirm any Supplier self-assessment by an on-site audit.

In Addition to these general rules, EnerSys reserves the right to request a new risk assessment process and/or product audit at any time with prior notification to Supplier. These audits may be conducted together with EnerSys customers.

The Supplier grants EnerSys entry to all production sites, test facilities, warehouses, and adjoining areas. EnerSys is granted insight into the Supplier's processes, documents, and records, where these relate to the Quality Management System and/or the quality of the products to be supplied to EnerSys.

The execution of such audits shall not affect the Supplier's responsibility for the product. Supplier shall remain fully responsible for the product

If an audit is not validated, the Supplier is obligated to present containment actions, or a CSL procedure may be requested by EnerSys until a follow-up audit confirms effectiveness of any corrective action plan.

In addition to audits, EnerSys reserves the right to visit Supplier for technical or commercial meeting with prior notification to Supplier.

4.3.2. Audit Corrective Actions Request

An Audit Corrective Action Request (ACAR) will be issued for each non-conformity detected during risk assessment or process audits. The Supplier must do the following:

- Perform non-conformities root cause analysis
- Present action plan in time defined during audit
- Develop corrective and preventive actions
- Confirm effectiveness of actions

4.3.3. Audit Levels

AUDIT LEVELS					
TYPE OF AUDIT	LEVEL OF SUPPLIER	VALIDITY PERIOD	LEVEL OF AUDIT	RESPONSIBILITY	FORM
Risk Assessment	Each New Supplier	On occurrence	Self-assessment & On-site	Supplier Quality Procurement Engineering	Appendix 3 Supplier Risk Assessment Questionnaire
	Existing Suppliers	Periodic - Every 2 years	Self-assessment		
		On occurrence • In any case when changes can impact business	Self-assessment & On-site		
Process Audit	Each New Supplier	On occurrence: • development of a new or existing component	Self-assessment & On-site	Supplier Quality Procurement Engineering	Appendix 7 Process Audit Questionnaire
	Existing Suppliers	Periodic - Every 2 years On occurrence: • product/process changes • based on performances	Self-assessment & On-site		
Product Audit	Existing Suppliers	Annual	Results presented to EnerSys by Supplier	Supplier Quality Procurement Engineering	Appendix 8 PPAP Template Example (dimensional report)

4.4. 7 Quality Basics

7 Quality Basics have been identified by EnerSys to support troubleshooting issues related to Quality. EnerSys recommends 7 Quality Basics to its Suppliers as a best practice.

- QB1 –The 1st off part OK? and Equipment start up OK? Quality Basic tool is used to check that all conditions required for start-up are recorded and are conforming to the requirement to allow production to start. It is necessary to have a defined method and acceptance criteria for each check point for the “1st off part OK?” and “Equipment start up OK?”. In the case of a non-conformity, production must not start, and an immediate analysis of the non-compliant part and/or equipment must be evaluated to allow production to start in a concessionary mode
- QB2 – Red Bins -this tool is used to identify the defect of the part, split up the NOK parts to be scrapped from those to be reworked and Isolate the NOK parts from the process workflow.
- QB3 – Rework under control – this tool is used to keep rework under control by working instructions with clear acceptance criteria, secured and segregated rework flow with associated tools and dedicated resources and identification and recording
- QB4 – Self Inspection – this tool is used to enable Immediate checking of the workmanship after the operation and to enable isolation of scrap or rework in case of non-compliant pieces
- QB5 – Final Inspection – this tool is used to define standard control checks in the last workstation before dispatch to the customer and to define, if required, the temporary quality wall to prevent defects reaching the customer
- QB6 – QRCI (Quick Response Continuous Improvement) - this tool is used for identification of the defect at source enables effective resolution. The operator is empowered to stop the defect parts according to the reaction rules and analyze the defect with the smart coach.
- QB7 – Poka Yoke – this tool is used to prevent human errors.

5.0 Definitions

APQP	ADVANCED PRODUCT QUALITY PLANNING for product and process: aim of APQP is to provide EnerSys with all the guarantees concerning the means to achieve product quality.
CAR	CORRECTIVE ACTION REQUEST
ACAR	Audit Corrective Action Request
CERTIFICATION	Notice given by an OFFICIAL organization based on the appropriate procedures or documents by which the component is recognized as being in compliance with STATUTORY requirements
CONFORMITY	Fulfilment of a requirement.
CONTROL PLAN	Documented description of the systems and processes required for controlling component.
CHARACTERISTICS FOR CONTROL	Measurable characteristics of 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.
Concession / Deviation	Written authorization by the Customer (EnerSys) to a Supplier to use, release or supply a limited quantity of a completed or partially completed product which does not comply with the specified technical requirements.
CSL	CONTROLLED SHIPMENT LEVEL 1 and 2: CSL1 and CSL2 are provisional procedures implemented with a view to guaranteeing certified deliveries while awaiting the reestablishment of the conformance of the production process
CSR	Customer Specific Requirements
DA	DESIGN AUTHORITY
FA	FIRST ARTICLE
FAIR	FIRST ARTICLE INSPECTION REPORT
FMEA	FAILURE MODE and EFFECT ANALYSIS: Deductive method and tools used to identify potential failure modes, their causes, and effects, and assess criticality of these failure modes, based on severity, occurrence, and detection probability criteria. Generic FMEA is applied on Product Design (DFMEA), Process Design (PFMEA), and Equipment. It can also be applied on Product functions (Concept FMEA)
GPS	Group Priority Suppliers
MSA	Measurement Systems Analysis
PDCA	PDCA (PLAN, DO, CHECK, ACT): is a methodology to settle and solve problems effectively. Based on continuous improvement, PDCA comprises 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 to consolidate the result and take action to prevent the re-occurrence of the problem.
PPAP	PRODUCTION PART APPROVAL PROCESS
PQA	PRODUCT QUALITY ASSURANCE
R&R	Gauge Repeatability and Reproducibility, is a statistical tool that measures the amount of variation in the measurement system arising from the measurement device and the people taking the measurement.
OTD	ON TIME DELIVERY is calculated for each Supplier by expressing the ratio of On-Time deliveries received, divided by the total deliveries received for the time period, expressed as a percentage
SQRR	SUPPLIER QUALITY REJECT RATE is calculated for each Supplier by expressing the ratio of REJECTED quantity received divided by TOTAL quantity received for the time period, expressed as a ppm (Part per Million)
SQMA	SUPPLIER QUALITY MANAGEMENT AGREEMENT
Supplier Categories	<ul style="list-style-type: none"> • Designer – design components which will be fit for EnerSys project specific purposes and will meet EnerSys specifications. The Supplier-designer is responsible for the definition, and where applicable, for the supply of the components. Approval of design by EnerSys does not absolve the Supplier from liability for the product failures detected by EnerSys or by Customer. • Manufacturer – develop a manufacturing process and manufacture a component designed by EnerSys. • Contract Manufacturer provides some service or material necessary for the performance of another's contract. A contract manufacturer is a manufacturer that contracts with a firm for components or products. It is a form of outsourcing. • Pass Thru Supplier (Handling Component) – deliver a component to EnerSys Customer through a warehouse. • Specific cases (limited SQM application): • Distributors – deliver standard components and catalogue/on shelf components available on the market • Proto Supplier - deliver proto parts only
5W2H Method	Stands for 5 W and 2H; or Who, What, When, Where, Why, How and How much (or often). It is useful as an information gathering technique when seeking to understand the problem

6.0 Appendix List

APPENDIX NO	DOCUMENT NO	DOCUMENT TITLE
Appendix 1	QMS-GFORM-002	Supplier Protocol
Appendix 2	QMS-GFORM-025	Supplier Component Review File
Appendix 3	QMS-GFORM-004	Supplier Risk Assessment Questionnaire
Appendix 4	QMS-GFORM-005	Supplier Quality Management Agreement
Appendix 5	QMS-GFORM-006	List of Characteristics for Control
Appendix 6	QMS-GFORM-027	PPAP Requirements and Check List
Appendix 7	QMS-GFORM-008	Process Audit Questionnaire
Appendix 8	QMS-GFORM-029	PPAP Template Example
Appendix 9	QMS-GFORM-010	Supplier Change Request
Appendix 10	QMS-GFORM-011	Supplier Deviation Request
Appendix 11	QMS-GFORM-012	Supplier 8D Report
Appendix 12	QMS-GFORM-028	PPM Calculation Method
Appendix 13	QMS-GFORM-014	Supplier Performance Report
Appendix 14	QMS-GFORM-015	GPS Notification/Exit
Appendix 15	QMS-GFORM-016	CSL1/CSL2 Notification/Exit Letter
Appendix 16	QMS-GFORM-026	Transfer Check List
Appendix 17	QMS-GFORM-030	Check List for Business Continuity Example
Appendix 18	QMS-GFORM-003	Supplier Advanced Product Quality Planning Guideline

7.0 Revision History*

REVISION	RELEASE	BY	DESCRIPTION OF CHANGE	CHANGE NO.	COMMITTED CHANGE
AA	9/26/18	J. Gaspari	Initial Release of Global Supplier Quality Manual	ECO 1002004	No
AB	10/13/21	M. Jarnot	Aligning SQM procedure with current practice	ECO 1002342	No
AC	02/18/22	M. Jarnot	Aligning capability of the process with the standard	ECO 1002406	No

*Note – Revision History is always the last page



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