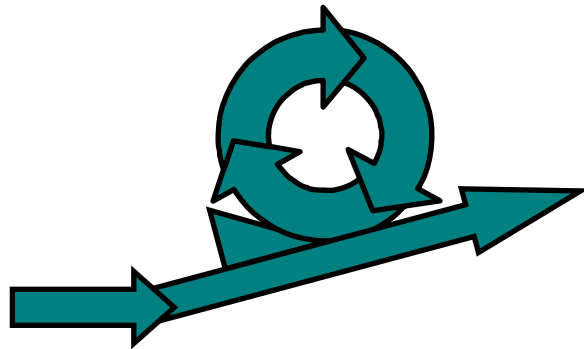


**Cummins Inc.**

**Supplier**

**Handbook**



**The Cycle**

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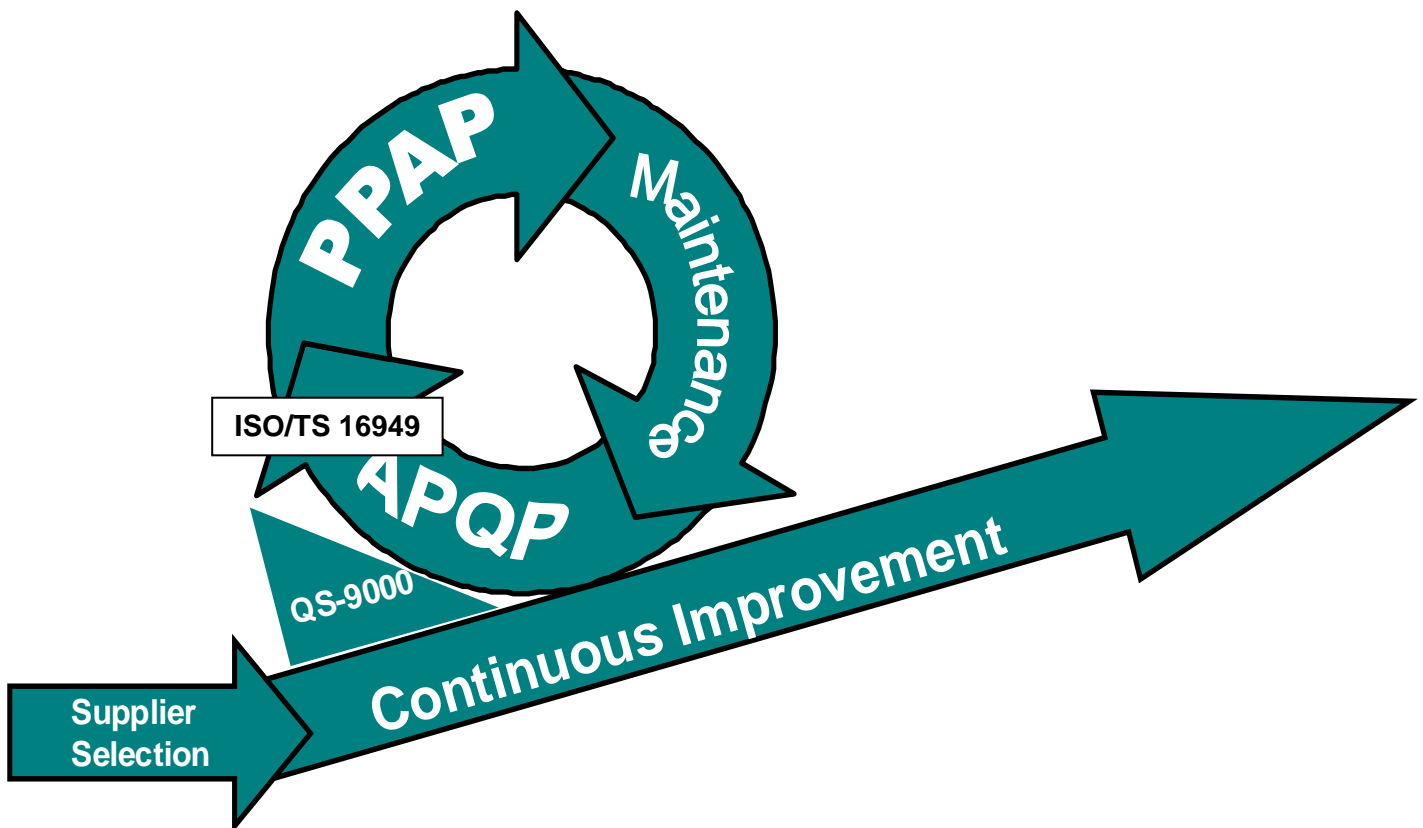
# Cummins Supplier Handbook

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# Cummins Supplier Quality Improvement Program

## The Cycle



# **Cummins Supplier Handbook**

## **- The Supplier Quality Improvement Program Cycle -**

### **A. Purpose**

Bought out finished and purchased material make up over 70% of the total cost of the Cummins finished product. Therefore it is essential to have clear, documented requirements and interaction processes between Cummins Inc. and its direct suppliers.

This Handbook communicates Cummins Inc.'s Customer Specific Quality requirements and expectations to Cummins' direct material suppliers. These requirements and expectations are known as the Supplier Quality Improvement Program Cycle(SQIP), which is depicted in the logo on the previous page.

### **B. Intent**

The SQIP Cycle was developed with three basic principles. They are:

1. Incorporate quality as one of the key considerations in new supplier selection
2. Assure that quality tools and processes are utilized by suppliers in the development of and revisions to their products and processes
3. Provide a framework for sustaining and improving the quality of supplier products and processes

### **C. Scope**

This manual applies to all suppliers of direct material to Cummins Inc..

## D. Acronyms and Definitions

Cummins and industry standard acronyms are used throughout the Handbook for brevity. The explanations below should be referenced when in doubt:

1. **AIAG** - Automotive Industry Action Group is an industry organization that, among other responsibilities, provides administrative support to the Automotive, Truck and Heavy Equipment industries for supplier quality requirements, and distributes related manuals and publications.
2. **APQP** - Advanced Product Quality Planning is a structured process for producing a quality plan, which supports the development and production of a product that will satisfy the customer. Reference the AIAG manual (*Advanced Product Quality Planning and Control Plan - APQP<sup>®</sup>*) for a complete description.
3. **Component Certification** – A process whereby the supplier certifies, in some cases with measurement data, that components are within specification.
4. **Cummins Seven Step Problem Solving** - A disciplined method for problem solving which emphasizes analysis for the true root cause and verification that the corrective action is effective in eliminating the root cause. The Seven Steps in the process are:
  - 1) Identify the Problem
  - 2) Determine and Rank Potential Causes
  - 3) Take Short Term Action and Containment
  - 4) Gather Data and/or Design Test
  - 5) Conduct Tests, Analyze Data, Identify Root Cause(s), Select Solution
  - 6) Plan and Implement Permanent Solution
  - 7) Measure, Evaluate and Recognize the Team.

This process has been adopted by the AIAG Truck & Heavy Equipment Group as its preferred approach to problem solving.

5. **Classification of Characteristics (C of C)** - The process of classifying product and process characteristics for the optimum utilization of engineering, manufacturing, and supply base resources. In TS16949 terms these are Customer Designated Special Characteristics. C of C has four types of characteristic:
  - a. **Critical Characteristic** - A dimension, material property, physical feature, etc. which, if not to specification could be a safety risk, or will certainly cause operational failure or a loss of performance.
  - b. **Major Characteristic** - A dimension, material property, physical feature, etc. which if not to specification will probably cause operational failure, loss of performance, increased service cost or disruption to manufacturing.
  - c. **Minor Characteristic** - A dimension, material property, physical feature, etc. which has not been classified as Key, Critical or Major. It exists only as a general class to describe characteristics that do not fit other classifications. Although not classified as Critical, Major, or Key the supplier is responsible for ensuring these characteristics meet the print specification. Cummins Turbo Technology calls these Standard Characteristics.
  - d. **Key Characteristic** - A dimension, material property, physical feature, process etc. that has been identified as being key to subsequent manufacturing or assembly operations. Key characteristics may be identified by the SQI Engineer. Key characteristics apply predominantly to minor characteristics.

Classification of Characteristics is intended to serve as a guide for the development of supplier process quality plans - not to relieve suppliers of the responsibility to produce all features to specification.

6. **Direct Material** - Components and assemblies used in Cummins' production processes that become part of the salable product. They are typically included as a Bill of Material item.

7. **FIRG** – Failure Incidence Review Reporting Group
8. **In-plant Defect PPM** - The number of parts with supplier-caused defects found within a Cummins facility versus the number of parts received from that supplier by the Cummins facility, reported as parts per million (PPM) on a monthly basis.
  - a. NOTE: For suppliers with multiple producing locations, each producing location will be considered separately.
9. **iSCM** – A supplier portal used by some Cummins Inc. BU's. Engine Business suppliers are required to register in iSCM.
10. **ISO9001:2000** - The ISO quality management system standard, and the minimum requirement for any direct material supplier to a TS registered Cummins Inc. Plant.
11. **ISO/TS 16949:2002** - ISO Technical Specification for the Automotive Industry. The specified quality system for strategic suppliers to Cummins automotive related businesses.
12. **LPA** – Layered Process Audit
13. **MSA** - Measurement System Analysis – a process to determine that measurement systems are capable of measuring to the desired accuracy and repeatability. Reference the AIAG manual (*Measurement System Analysis - MSA*) for a complete description.
14. **MQV** - Manufacturing Quality Verification – a process used by Cummins and Cummins' suppliers to reduce defects sent to customers by looking at FMEA findings and historical data, such as OEM defects, warranty, and customer touch points, and ensuring that steps have been taken to prevent these defects from reaching our customers. Steps can include, but are not limited to, design changes, process design changes, and fail-safing.
15. **NCMR** – Nonconforming Material Report
16. **OEM** – Original equipment manufacturer
17. **OEM Defect PPM-Supplier** - The number of Supplier Caused OEM defects divided by the number of units shipped expressed in parts per million (PPM).
  - a. NOTE: For suppliers with multiple producing locations, each producing location will be considered separately.
18. **PCC Run** – Production Capability Certification – Cummins verification that supplier production capability and readiness will meet full production timing and volumes. The intent is to identify manufacturing problems prior to full production that typically don't become evident until full production runs are initiated. The process is also used to verify supplier capacity
19. **PCM/VPCR** - Product Change Management is the system through which Cummins typically controls changes to existing product. A Value Package Change Request is the Cummins document that details the specifics of and approvals for the individual changes.
20. **PPAP** - The Production Part Approval Process is the process used to ensure new or changed components meet Cummins quality requirements. It is often used in conjunction with APOQ. No new or changed parts can be shipped to Cummins before a PPAP is approved by a Cummins SQIE. Reference the AIAG manual (*Production Part Approval Process – PPAP*) for a complete description.
21. **Quality System** - Third Party Registration - Certification by an independent registrar which is qualified by a national accreditation body to perform audits to an accepted standard such as ISO/TS 16949:2002 and ISO9001:2000 and to register the audited facility for a given scope.
22. **RPS** – Rapid Problem Solving process
23. **SCAR** – Supplier Corrective Action Request

24. **SCR – Supplier Change Request** – process – suppliers are required to use to request approval of a change to a product or process.
25. **SIP** – Supplier Improvement Process
26. **Six Sigma** - Statistically based improvement process used throughout Cummins. Suppliers will be requested to participate where significant opportunities for improvements are identified.
27. **Source Release** – Process for ensuring the quality of prototype components
28. **SQIE** - Supplier Quality Improvement Engineer is the person(s) at Cummins responsible for the ensuring suppliers execute various elements of the SQIP such as APQP, PPAP, and SCAR's.
29. **SQIP** - Supplier Quality Improvement Program is the Cummins term for the process to be followed by Cummins SQIE's with suppliers of direct materials. This is also referred to as the Cycle in this Handbook.
30. **Supplier Scorecard** - A Cummins purchasing system that rates the supplier in the categories of Price/Cost, Quality, Delivery, Technology, and Attitude/Administration.
31. **VPI** - Value Package Introduction is the Cummins process for new product introduction. This process is the vehicle through which Cummins satisfies the requirements of APQP.

## **E. Cummins Inc. Supplier Code Of Conduct**

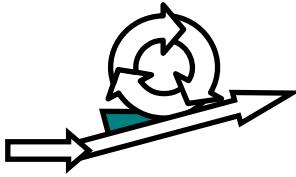
To assist suppliers in understanding Cummins expectations, the Cummins Inc. has a Supplier Code of Conduct, which applies to all businesses that produce goods or provide services for Cummins and any of its subsidiaries, joint ventures, divisions, or affiliates.

While Cummins recognizes that legal and cultural requirements vary in a global business environment, the Code sets forth certain universal requirements that suppliers are expected to follow.

The Code provides the foundation for Cummins ongoing evaluation or audit of a Supplier and constitutes additional terms of the Sourcing Agreement. It also deals with a Supplier's workers, including any individual who provides direct service to the Supplier, whether full-time, part-time, temporary or occasional employment.

The Cummins Inc. Supplier Code of Conduct can be found at [www.Cummins.com](http://www.Cummins.com) under the heading Global Citizenship.

## F. Quality System Requirements



1. A quality system is an integral part of a successful quality program. It is not, however, a guarantee of quality products and processes. A quality system establishes disciplines. Only when the disciplines are in place and effectively executed will the benefits be derived. Updating the quality system with improvements made also acts as the “chock” to assure that the improvement is maintained.

2. Supplier quality system requirement by Cummins Inc.:

Entity	ISO9001:2000	ISO/TS16949:2002	Exceptions
Cummins Inc.	All Direct Material Suppliers	All Applicable Suppliers (3)	By Approval Only (1)

NOTE 1: Cummins Inc. will allow no exceptions for suppliers who ship products to Cummins Inc. plants who are ISO9001:2000/TS16949:2002 registered. While Cummins would like all suppliers to be ISO9001:2000 certified, exceptions for suppliers who ship to plants which are not TS16949 certified exceptions are allowed, see NOTE 2.

NOTE 2: The minimum acceptable quality system registration for a new supplier is ISO9001:2000 unless written approval of exception is given by the applicable Cummins Purchasing Quality Leader. Similar approval is required for the use of any supplier who is not ISO9001:2000 registered (see Note 1).

NOTE 3: All suppliers who meet the AIAG applicability rules for becoming an ISO/TS16949 supplier shall pursue certification. In the meantime, as a minimum, these suppliers shall follow PPAP and APQP rules and all requirements listed in this manual.

NOTE 4: Suppliers who are not registered to ISO9001:2000 must have systems in place to ensure they meet Cummins Quality, Cost, and Delivery needs.

3. Cummins expects its Tier 1 suppliers to manage the quality of their supplier base. Cummins understands that Cummins Tier 1 suppliers must occasionally use suppliers who are not ISO9001:2000 registered due to factors such as supplier size, volume, specialty products, etc.. Cummins does not prohibit the use of these suppliers.

4. Cummins requires that Cummins Tier 1 suppliers allow and facilitate Cummins visits and audits of Tier 2 suppliers if requested.

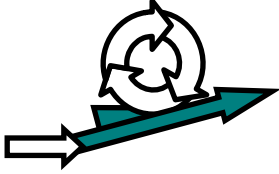
5. Any change from one supplier to another (including change in supplier site) requires the change be approved through the use of the Cummins Supplier Change Request process (ref. J.2 and L.2 and 3).

6. Where Cummins purchases “Off-The-Shelf” items (e.g. items that are commercially available, purchased from a store, or catalogue, are not supplied to a Cummins TS16949 registered plant, and are not purchased based on a Cummins print) no quality registration requirements are invoked.

7. ISO/TS 16949 and ISO9001:2000 contain numerous clauses such as “...when required by the customer” or “...where specified by the customer.” The Cummins Supplier Handbook is Cummins repository for these requirements. All items in this Cummins Supplier Handbook shall be considered Cummins’ “customer requirements”.

8. It is impossible to cover every conceivable situation with a blanket statement or definition. If a situation occurs that is not covered by the Cummins Supplier Handbook, the Cummins SQIE is the main point of contact for getting questions answered and situations resolved.

## **G. Continual Improvement**



1. Cummins expects suppliers to monitor the outputs of their quality system and continually improve in quality, service, and cost. This philosophy should be fully deployed throughout the supplier's organization. Continual improvement in product characteristics means optimizing at a target value and reducing variation around that value. This assumes that product characteristics currently meet specifications. Cummins customers have high expectations of the quality of the Cummins products. In order to meet these expectations we are equally demanding of our supply base.

2. Suppliers are also expected to apply continual improvement techniques to non-product characteristics that impact quality, service, and cost such as machine downtime; floor space utilization; first-time PPAP approvals; testing methods; process flows etc.

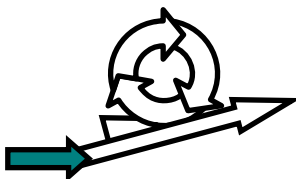
3. Suppliers are encouraged to adopt Six Sigma as a formal improvement process, particularly when aimed at improving quality or reducing costs.

4. Suppliers with high value, chronic or repeat quality issues need to participate in a Cummins driven problem solving initiative.

5. Suppliers are expected to implement Cummins Manufacturing Quality Verification (MQV) tool as part of their continual improvement process. MQV is a tool for identifying past and potential defects and ensuring that those defects cannot reach Cummins or its customers. Cummins uses MQV as an APQP tool and as a tool to drive continual improvement.

6. Suppliers shall use statistical tools for managing and improving processes as requested by the Cummins SQIE. Statistical tools may include but are not limited to Statistical Process Control.

## **H. Supplier Selection**



1. For potential suppliers to Cummins, the selection team from Cummins Inc. will assess the supplier against specific requirements including Quality, Total Cost of Ownership (TCO), Technical, Regulatory, Financial, Warranty Commitment, Target Cost and Future Cost Reductions. The quality perspective is detailed in this Handbook.

2. As a potential supplier you will be asked for a copy of your ISO/TS 16949 or ISO9001:2000 certificate which covers the plant location and product proposed for delivery to Cummins.

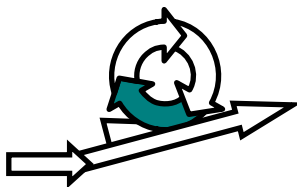
3. Additionally, you will be asked to complete a Supplier Selection Checklist as a prelude to a site visit by the selection team. During the site visit, qualified members of the selection team will perform a Supplier Selection Checklist Audit and/or a Focused Cummins Quality System Assessment. The selection team will be comprised of representatives of engineering, manufacturing, purchasing, quality and finance. The Supplier Selection Checklist audit looks at many of the supplier's systems in detail with the objective of determining which areas need to be improved prior to launching a Cummins product at that facility. The Focused Cummins Quality System Assessment, rather than looking for the presence of an entire quality system, focuses on selected elements of the system and looks for evidence of routine execution.

4. Process/Product audits of similar products being run on the process proposed for Cummins may also be included as part of the Supplier Selection Process.
5. When the selection team completes their evaluation and a selection is made, the new supplier is formally introduced into the SQIP Cycle.
6. Suppliers which sell \$5 million to Cummins in a country of import shall have a resident technical resource to handle sorting, screening, and issue resolution. Suppliers which sell less than \$5 million dollars to Cummins in a country of import shall use a third party for these types of activities at the supplier expense. Special arrangements can be made between the Cummins Inc. Plant and the supplier at the request of the Cummins plant or Cummins purchasing. In some cases, suppliers which sell less than \$5 million to Cummins in a country of import may be required to have a resident technical resource.

## **I. Design Control**

1. Design control refers to the 'ownership' of the design of the component being sourced.
  - a. Cummins Design Control – the component is wholly designed, developed and specified by Cummins. Suppliers are encouraged to participate in the design of these products to contribute their knowledge and expertise (e.g. process requirements, cost reduction opportunities etc.). If a component is under Cummins design control, it is Cummins' responsibility to address quality issues arising from the design.
  - b. Supplier Design Control – the component is wholly designed and developed by the supplier to meet a Cummins specification, performance requirement, and technical profile. If a component is under the Supplier's design control, it is the supplier's responsibility to address quality, reliability, and durability issues arising from the design.
    - i. The supplier is responsible for completing Design Failure Mode Effects Analysis, Design Reviews, and specific product testing that demonstrates compliance to expected reliability and durability (life).

## **J. APQP**



1. The requirement of APQP is crucial to the development of new products and processes, the revision of existing products and processes, and moving components from one supplier to another. Its single most important tenet is that quality does not just happen, it must be planned. Quality must be in the design of the product as well as in the development of the process that will produce the product. Three key outputs of APQP are the Process Failure Mode and Effects Analysis, Control Plan, and PPAP. Suppliers are expected to be knowledgeable of and follow the APQP process.

2. As a supplier to Cummins you should be aware that at least two APQP processes happen in conjunction with one another:
  - a) Cummins initiates an APQP process internally in the development of new products (through VPI); and,
  - b) As a supplier of a component or assembly to the new Cummins product, you shall initiate an APQP process of your own when engaged by Cummins. Your level of involvement will vary depending on where the responsibility for design control resides for the component or assembly that you will be supplying

Note 1: Cummins Inc. New Product Introduction Process, known at Cummins as Value Package Introduction (VPI), contains some Cummins-specific requirements not explicitly defined in APQP. You will be made aware of the additional requirements as you are engaged in the VPI process by the Cummins SQIE. Required task completion dates will be assigned and monitored by the Cummins SQIE.

Note 2: Suppliers are required to utilize the APQP process regardless of the risk of their particular process. The level of oversight will vary depending on risk.

3. Each supplier participating in a New Product Introduction (VPI) project must be able to provide evidence of meeting our APQP checklist requirements for their component. APQP is applicable to VPI components, the revision of existing product designs, and to source changes (moving a component from one supplier to another). Some APQP elements need not be re-developed in every case. If the supplier and the Cummins SQIE determine that an APQP element is not affected by the change, no action is required other than documenting the consideration. If an element is affected by the change, prior work is updated accordingly.

4. The Cummins SQIE will engage a supplier for APQP activity with required task completion dates at the appropriate time in the Product/Process development cycle.

5. Cummins requires higher risk suppliers to complete the Cummins Early Care process for new components, changes from one supplier to another, and for some component design or process changes. Early Care includes but is not limited to:

**a. Production Capability Certification (PCC Run)** – test of capacity and quality run by the supplier with Cummins personnel present. Similar to “run at rate”.

**b. Source Release** – a process for ensuring prototype parts meet quality requirements

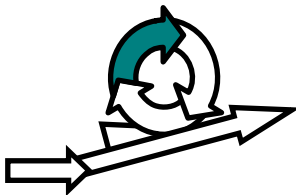
**c. Component Certification** – a process whereby the supplier certifies, in some cases with measurement data, that components are within specification. Requirements for Component Certification will be identified by the Cummins Inc. receiving plant.

6. Suppliers which sell \$5 million to Cummins in a country of import shall have a resident technical resource to handle sorting, screening, and issue resolution. Suppliers which sell less than \$5 million dollars to Cummins in a country of import shall use a third party for these types of activities at the supplier expense. Special arrangements can be made between the Cummins Inc. Plant and the supplier at the request of the Cummins plant or Cummins purchasing. In some cases, suppliers which sell less than \$5 million to Cummins in a country of import may be required to have a resident technical resource.

7. Suppliers are required to submit APQP and PPAP documentation electronically as specified by your Cummins SQIE. Please contact your SQIE for details.

8. Cummins Inc. has developed a formal APQP review process. This review process brings the supplier’s management, Cummins Inc. plant management, engineering, purchasing, and others together at different stages of the APQP process to review status of APQP activities associated with a specific component. Cummins Inc. suppliers shall participate in Cummins Inc. formal APQP process as requested by their Cummins Inc. SQIE contact.

## **K. PPAP**



1. PPAP (Production Part Approval Process) is a basic element of the Cycle. PPAP applies to both new and existing product and is intended to assure that the new or revised products and processes are production ready. PPAP can be the end result of APQP or a process in its own right to manage smaller changes. Regardless of whether Cummins initiates a new or revised component design, or whether the supplier initiates a change to an existing

component or process, a PPAP must be approved by Cummins SQI prior to production parts being shipped from the supplier to Cummins. Suppliers must be knowledgeable of and follow the AIAG PPAP process.

2. Cummins requires suppliers to follow the latest version of the AIAG PPAP manual. Suppliers must obtain written approval from Cummins for product or manufacturing process changes before shipment of components to Cummins (ref M2, a-e). Unapproved changes cause serious issues often in spite of the fact that they were made by the supplier with the best of intentions. Cummins must be notified of **pending** changes using the **Cummins Supplier Change Request Process (SCR)**. Informed decisions are then made on the impact of the changes and whether a full, partial, or no PPAP submission is required. It is the supplier's responsibility to ensure that Cummins has approved the PPAP before any parts are shipped to a manufacturing location.

NOTE 1: Some Cummins locations may batch certain changes and approve on a calendar basis (e.g., twice yearly).

### 3. Cummins-specific PPAP information is detailed here:

- a. Where the PPAP manual states "...contact the customer" or "...contact the customer product approval activity" that person is the SQIE at Cummins.
- b. PPAP Interim Approvals may be utilized throughout the prototype and pre-launch phases of VPI, however, only the Cummins SQIE can make the decision to approve a PPAP as interim. Suppliers should always strive for full approval. Interims should be the exception.
- c. The Submission Level (1 through 5) required by Cummins is defined by the SQIE for each PPAP submission.

NOTE 1: A Level 5 submission may include supplier site activity such as a Process/Product Audit or other means of verifying the capability of the production system.

NOTE 2: Per AIAG manual, the supplier must complete all elements of a PPAP regardless of the submission level chosen, unless specifically waived by Cummins using iSCM, the electronic PPAP request system.






NOTE 3: In cases where PPAP volumes are very low, a "Special Level 4" PPAP may be utilized. Reference section J.3.1.note 3. You must get approval from your Cummins SQI engineer to use this variation.

- d. Three sample parts are the default requirement for dimensional verification. The Cummins SQIE will notify the supplier if other than three sample parts are required. Dimensional verification requires a full layout of all dimensions unless previously agreed upon with the Cummins SQIE.
- e. Cummins subscribes to the Truck OEM Specific Instructions defined in the PPAP manual.
- f. Whenever a Cummins Engine Business Unit drawing references Cummins Engineering Standard 10,012, Source Approval, all changes, regardless of their nature must be reviewed by Cummins engineering. Cummins engineering will determine the level of testing required prior to making the change. Tests may be performed by Cummins, the supplier or a combination of both. The supplier has the obligation for maintaining evidence of the test results (regardless of who performed the tests) per the PPAP requirement "Material, Performance Test Results", and for evidence of Cummins Engineering approval(s) per the PPAP requirement "Engineering Approval."

NOTE 1: Some Source Approval testing may extend beyond the need date for production parts. In these cases, Cummins Engineering may authorize PPAP Interim Approval until the testing has been satisfactorily completed. Cummins Product Engineering must approve interim PPAP's for all components that have not completed source approval testing.

NOTE 2: Other, non-Source Approval functional, material or performance testing which is required on the drawing falls under PPAP element "Material, Performance Test Results."

- g. The AIAG PPAP manual refers to customer's "Special Characteristics." Special characteristics at Cummins are indicated on Engineering drawings with the following symbols:

Characteristic Type	
	Critical
	Major
	Key
	Significant Minor
	Six Sigma

Special characteristics are to be documented in the "Initial Process Study" of PPAP.

Note 1: Key characteristics can be identified on the print or may be identified by the Cummins SQIE. (ref item K.3.h.)

- h. In addition to these Critical and Major drawing characteristics, the Cummins SQIE may specify other characteristics as KEY characteristics for process control purposes. These Key characteristics are to be documented the "Initial Process Study" of PPAP.
- i. Unless otherwise directed by the Cummins SQIE, all Critical, Major, and Key characteristics are to be statistically studied and included in PPAP "Initial Process Study." In general, Cummins requires a Quality (Cpk) Index greater than or equal to 1.67 as acceptance criteria for initial short term studies on Critical, Major and Key characteristics.

NOTE 1: It is important to consult the Initial Process Studies section of the PPAP manual for the discussion on stability and acceptance criteria for initial studies. Per these discussions, initial study acceptance criteria of quality indices between 1.33 and 1.67 **may** require some improvements after careful review of the data.

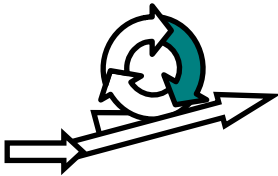
NOTE 2: When estimated annual usage is less than 500 pieces, refer to the Truck Industry-Specific Requirements of the latest revision of AIAG PPAP Manual. These instructions define a minimum sample size, two Control Plan options, two initial short-term statistical study options and initial short-term study acceptance criteria. Cummins subscribes to these Truck OEM-Specific Instructions. When usage is over 500 pieces, a 300-piece run, with 100 of the 300 used for statistical analysis is required. High Volume PPAP's will not be fully approved without sufficient data. The Cummins SQIE and the supplier will agree to the requirements per these instructions. A 30-piece machine study is NOT appropriate for PPAP approval.

Note 3: In cases where volumes are extremely low and statistical analysis of data impractical (e.g. normal manufacturing runs of less than 30 pieces and total yearly volume of less than 500 pieces) the supplier, upon agreement with the SQIE, may use a Special Level 4 PPAP. This variant of the AIAG PPAP process is a Level 4 PPAP that requires a warrant, a control plan including set-up control, layout, material certification, and inspection information. All other PPAP requirements are waived. Special Level 4 PPAP's are intended only for those components with such low volumes that statistical information is invalid. All other PPAP's should follow the standard or truck PPAP requirements of AIAG.

NOTE 4. PPAP's for Standard Products, products that are ordered from a catalogue (e.g. grade 8 bolts), are requested at the discretion of the Cummins SQIE. Where PPAP is required, all rules of PPAP apply.

NOTE 5. "Off The Shelf" components, which are very low volume components from suppliers in industries that do not use the PPAP process (e.g. specialty gauges for the marine business) do not require PPAP's. These suppliers usually replace any defective components at no charge to Cummins.

- j. While statistical studies are specified on Critical, Major and Key characteristics, this does not mean that the other characteristics on Cummins Engineering drawings may be ignored. All characteristics must meet specification, and it is in the supplier's best interest to understand their capability on ALL features. All Significant Minor and Six Sigma characteristics are to be studied using a minimum 30 piece sample and must demonstrate a capability of CpK 1.0.
- k. The Dimensional Results section of PPAP is where these characteristics are reported for the number of Sample Product required.
- l. Cummins Inc. suppliers must have the ability to submit PPAP documentation electronically. Documentation submission requirements will be defined by the Cummins Inc. SQIE and may vary by business unit.
- m. Cummins' drawings state specific Engineering, Material, Process and Inspection standards that are required to enable the supplier to manufacture the part. Compliance to these standards shall be confirmed in writing by the supplier. The supplier may use the dimension report/ISIR and material/performance documents to record their compliance statements.



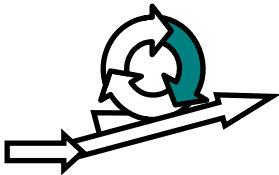
## **L. Non-conforming Material**

1. In the event that quality problems are experienced with a supplier, Cummins' corrective action process may escalate through several phases depending on the adequacy and timeliness of the supplier's response and the effectiveness of the actions taken. It may also go straight from problem notification to Senior Management depending on severity and urgency.
2. Cummins will notify the supplier when a nonconformance has occurred. At the time of notification, the supplier will also be advised if a corrective action response is required.
  - a. If requested, the supplier will complete the Cummins Seven-Step Problem-Solving process.
  - b. If an NCMR is issued but a SCAR is not, it is Cummins expectation that the supplier, as a minimum, will take actions to contain any additional defects. While no formal response is required in this case, the supplier is expected to take appropriate action to prevent additional defects from reaching the Cummins site. Cummins SQIE's may check supplier's containment actions as part of the Cummins Process/Product audit process.
  - c. The NCMR gives the supplier the opportunity to document actions taken and Cummins suggests that the supplier document these actions. In some cases, a Cummins plant may request that the supplier respond to an NCMR. If response is requested, the supplier is expected to comply.
    - i. NOTE: Reference the AIAG manual (*Seven-Step Problem-Solving Process for Truck and Heavy Equipment Suppliers*) for recommended methodology.
    - ii. NOTE: If the supplier has institutionalized a different problem solving methodology (e.g., 8D) that is proven to be consistent with the intent of the Cummins Seven Step, the supplier's response may be accepted using their format.
3. If a SCAR (Supplier Corrective Action Request) is issued, the following must take place:
  - a. Containment must be in place within one hour of finding the defect
    - i. The supplier must have a documented containment process
    - ii. The supplier's containment process must cover all possible areas of potential defects including:
      1. Supplier's manufacturing location

2. All potential transportation links (e.g. supplier to ship, ship to warehouse, warehouse to Cummins, etc..)
    3. All warehousing operations from the supplier through the Cummins facility
    4. The Cummins facility
  - b. Root cause shall be identified and short term action in place within 48 hours of finding the defect. If a part is "required" to complete the root cause analysis, the 48 hours begins when the supplier receives the part. However, all attempts shall be made to complete the root cause analysis without having component physically in hand. Photographs, measurement data, and defect descriptions are usually sufficient for this purpose.
  - c. Long term action plan submitted with 5-10 working days of receipt of SCAR
  - d. Long term action plan in place within 30 days of finding the defect
    - i. Timeliness of suppliers' responses to these due dates are measured and included in the Supplier Balanced Scorecard.
  - e. Cummins reserves the right to institute third party certification at the Suppliers location if a Supplier Corrective Action is inadequate or in the case of a recurring defect. Third party certification will be at the Supplier's expense.
  - f. Suppliers are required to use the systems specified by their Cummins SQIE to respond to NCMR's and SCAR's.
4. All SCAR responses will be reviewed by appropriate Cummins quality personnel (e.g. SQIE) for adequacy. Unacceptable responses will be returned to the supplier for further work.
5. Repetitive nonconformance, adverse quality trends, or other issues may escalate the corrective action process to include, but not be limited to:
- a. Formal Process/Product Audit of the supplier's facility by Cummins Supplier Quality, looking for systemic issues.
  - b. Focused problem solving activity with agreed measures and targets and routine progress reporting into Cummins.
  - c. Submission of capability information on selected characteristics monthly
  - d. Submission of Paynter Charts tracking defects and Step 3 and Step 6 action monthly
  - e. Participation in 6 Sigma projects
  - f. Third party certification process provided at the supplier's expense.
  - g. Participation in a formal Cummins Supplier Improvement Process program (SIP)
- These activities will be monitored at a senior level at Cummins and have the active participation of senior management at the supplier.
6. The final escalation of the corrective action process, if required, is a meeting of the supplier's highest management with appropriate Cummins' Plant, Purchasing or Corporate senior management. The supplier must be prepared at this meeting to commit resources to resolve the issues. Failure to follow through with these commitments would initiate re-sourcing activity by Cummins.
7. Cummins monitors supplier-caused disruption costs to Cummins and its Customers. Costs associated with supplier caused disruptions will be recovered from the supplier. Typically these costs could arise from:
- a. nonconforming material detected within Cummins or by its customers
  - b. supplier caused warranty issues
  - c. line stoppages at Cummins or its customers due to supplier issues
  - d. SQI work beyond normal planned activity
8. Suppliers which sell \$5 million to Cummins in a country of import shall have a resident technical resource to handle sorting, screening, and issue resolution. Suppliers which sell less than \$5

million dollars to Cummins in a country of import shall use a third party for these types of activities at the supplier expense. Special arrangements can be made between the Cummins Inc. Plant and the supplier at the request of the Cummins plant or Cummins purchasing. In some cases, suppliers which sell less than \$5 million to Cummins in a country of import may be required to have a resident technical resource.

## M. Maintenance and Improvement



The Maintenance element perpetuates the Cycle and establishes on-going updates and monitoring of Cummins' relationship with the supplier. This element contains both Cummins and supplier responsibilities.

### 1. Quality System Registration

The supplier shall maintain their Quality System Registration through their registrar's surveillance program and will notify the Cummins SQIE of any change in their registration status such as a new certificate number, suspension, revocation or switch to another registrar. The supplier must submit a copy of their registration to Cummins Inc..

### 2. Process/ Product Supplier Change Control

- a. The supplier shall notify the Cummins SQIE of any proposed process or product changes as described in the AIAG PPAP manual. Failure to adhere to PPAP notification rules have led to severe quality issues.
- b. The supplier shall obtain approval for all process and product change requests from their Cummins SQIE prior to implementing a change. **Proposed** changes shall be approved using the Cummins Supplier Change Request Process (SCR). Informed decisions are then made on the impact of the changes and whether a full, partial, or no PPAP submission is required. **It is the supplier's responsibility to ensure that Cummins has approved the PPAP before any parts are shipped to a manufacturing location.**
- c. Changes to the suppliers direct material supply base require the supplier to submit a Supplier Change Request (SCR). Upon approval of the Supplier Change Request the supplier may be required to submit a PPAP by the Cummins SQIE.
- d. The supplier shall gain approval from the Cummins SQIE using the Supplier Change Request process when **any** alternate process is to be used. NOTE: An alternate process is one that is different than the process used during PPAP
- e. Products produced on alternate processes may be subject to increased inspection and test requirements as agreed with the SQIE. **In all cases Item 2.d. applies.**

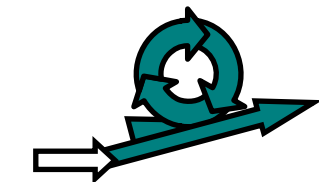
### 3. Quality Data

- a. The supplier shall maintain routine quality data (e.g., quality indices updates, reliability test results, etc.) that are required by the Cummins Engineering drawing, agreed to in the APQP/PPAP elements of the Cycle, or established as part of a corrective action plan. Such data shall be made available to Cummins upon request.
- b. The supplier shall maintain on-going capability data for all customer "special" characteristics". All characteristics identified as major or critical on the print, and any characteristic that has been deemed "key" by the SQIE falls under the category of a customer "special" characteristic. The

supplier shall make capability information available to Cummins upon request. In some cases, suppliers will be requested to provide capability on a routine basis (e.g. monthly). The supplier shall comply.

- c. Cummins will monitor the quality performance of the supplier primarily through In-plant and OEM Defect PPM measures. Cummins will report these measures to the supplier.
- d. Zero PPM is the goal for both measures. Failure to meet this goal may result in corrective action activity as described in Section L, Non-Conforming Material. Cummins will set interim goals (targets) for suppliers who cannot immediately meet the zero defect goal. These targets will be reduced each year with the expectation that these suppliers will eventually meet the zero PPM goal.

### **N. Perpetuating the SQIP Cycle**



1. APQP and PPAP continue to provide inputs to the Maintenance element as new products and processes are developed and existing products and processes are improved. Likewise, Maintenance provides input to future APQP and PPAP projects with information on suppliers' performance history. Following the elements of the Cycle along with sincere execution of ISO/TS 16949 will promote the upward slope of Continuous Improvement. Supplier performance in all elements of the Cycle will be considered in future sourcing decisions.

### **O. Other Cummins Supplier Specific Quality Requirements**

#### **1. Record Retention**

- a. The supplier shall maintain PPAP records for the life of the product plus one year
- b. The supplier shall maintain inspection and test records for three years minimum

#### **2. Access To Supplier Sites**

- a. The supplier shall allow on-site verification activities as required by Cummins and Cummins' customers
- b. The supplier shall allow on-site Process/Product Audits and System Assessments when requested by Cummins
- c. The supplier shall allow and facilitate visits by Cummins Inc. personnel to their suppliers for purposes of audit, PPAP review, APQP review, review of corrective action effectiveness, or any other reason related to the quality of components produced for Cummins.
- d. The supplier shall allow direct communication with their manufacturing facility on quality issues.

#### **3. Quotation Criteria**

- a. When submitting a quotation, the following criteria shall be addressed:
  - 1) Clear understanding and agreement on the product specifications, requirements and applications
  - 2) Internal capabilities sufficient to manufacture products at consistent, acceptable, quality and performance levels
  - 3) Recommendation of any changes that will prove advantageous to product quality, performance, price and delivery
  - 4) Notice of any exceptions to be included with quotation bid

#### 4. General

- a. The supplier shall use the AIAG reference manuals for APQP, SPC, PPAP, FMEA and MSA processes.
- b. MSA acceptance limits shall be as follows:
  - 1) P/T Ratio (Precision to Tolerance)
    - a. P/T Ratio (Precision to Tolerance Ratio) is less than 10% is acceptable
    - b. P/T Ratio between 10 and 30% is marginally acceptable
    - c. P/T Ratio greater than 30% is unacceptable.
  - 2) R&R (Repeatability and Reproducibility)
    - a. R&R less than 15% is acceptable
    - b. R&R between 15% and 30% is marginally acceptable
    - c. R&R greater than 30% is unacceptable
- c. The supplier shall appoint a 'quality contact'. This individual will be the prime path for communication of these handbook requirements to the supplier's organization.
- d. The suppliers 'quality objectives' shall be in line with Cummins quality objectives, particularly PPM (zero defects), lead-time, and improvement targets
- e. The supplier shall have the ability to communicate electronically with Cummins to address PPAP, SCAR, NCMR, Scorecard, Survey, and Supplier Change Requests.
- f. Any tooling, gauges etc. provided by Cummins shall be controlled within the suppliers system (e.g. for calibration requirements)
- g. The supplier shall have deployed statistical methods to control product features and reduce variation as appropriate
- h. The supplier shall meet Cummins packaging requirements as defined in the Cummins packaging standards titled A. "Production Component Packaging Standards Worldwide Operations", B. after market "Service Parts Packaging Standards Worldwide Operations". Packaging standards are available on Cummins electronic systems.
- i. The supplier shall comply with customer special requests and Cummins Inc. customer's requests such as IMDS completion, customer annual layout, and Layered Process Audits (LPA) as requested by Cummins.
- j. Suppliers shall comply with the following standards:
  - 1) AIAG CQI-9 Special Process:Heat Treat System Assessment
  - 2) AIAG CQI-11 Special Process:Plating System Assessment
  - 3) AIAG CQI-12 Special Process: Coating System Assessment

## **P. Additional Information**

### 1. AIAG Ordering

In the United States, all manuals (PPAP, APQP, etc.) referenced in the Handbook may be ordered by contacting the AIAG at:

Automotive Industry Action Group  
P O Box 633719  
Cincinnati, OH 45263-3719  
Phone (248) 358-3003      Fax (248) 799-7995

or, ordering information is available on AIAG's web site at:

[www.aiag.org](http://www.aiag.org)

For information on distributors outside the United States with non-English language publications, see the AIAG web site:

[www.aiag.org/quality/dist.html](http://www.aiag.org/quality/dist.html)

### 2. Forms

Many forms utilized in the Cycle are those referenced through PPAP, APQP, etc. Of all those referenced forms, the one that is required to be used without modification is the North American Truck Industry Part Submission Warrant (PSW) illustrated in PPAP. Other referenced forms (e.g., the Control Plan in APQP), are preferred to be used without modification; however, supplier modified forms are acceptable provided all information contained on the reference format is included.

Other forms utilized in the Cycle may be Cummins-required (e.g., Advanced Quality Planning Status Report) or Cummins-preferred (e.g., Seven Step Problem Solving). The Cummins SQIE will answer supplier questions on whether a form must be used without modification (Cummins-required) or if the form may be substituted with a form meeting the intent (Cummins-preferred). NOTE: Use of operator instructions in place of a control plan is not acceptable.

### 3. Revision Control

- a. This Handbook is a controlled document. It is the responsibility of Cummins Supplier Quality to get the latest revision to each supplier. This will be accomplished by posting the Handbook on the iSCM website ([iSCM.Cummins.com](http://iSCM.Cummins.com)). It is the supplier's responsibility to ensure compliance to customer specific requirements by periodically monitoring the website for change.
- b. Cummins utilizes Lotus Notes<sup>®</sup> for electronic mail.
- c. The preferred software for electronic mail attachments incoming to Cummins is Microsoft<sup>®</sup> Word<sup>®</sup>, Excel<sup>®</sup>, Project<sup>®</sup> or PowerPoint<sup>®</sup>.