



SUPPLIER QUALITY MANUAL

REV 2 - 2017

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Quality Policy:

It is Vconverter's policy to provide superior workmanship and delivery at a competitive value that will meet or exceed customer expectations through continual improvement of our quality management system.

Vconverter's core values:

1. Customer focus
 - Anticipating our customer needs along with adherence to customer requirements
2. Leadership
 - Thru Employee mentoring "Today's engineers will teach new comers"
3. Involvement of people
 - Thru employee profit sharing "Reward profit back to the people"
4. Process approach
 - By focusing heavily on production system growth
5. System approach to Management
 - Developing systems to increase employee output
6. Continual improvement
 - Employee empowerment - "everyone manages and develops own areas"
7. Factual approach to decision making
 - Using data to make effective decisions
8. Mutually beneficial supplier relationships
 - Developing relationship thru fair, honest, & ethical transactions

Introduction

At Vconverter, we are dedicated to continuously striving to be a leader in the manufacture of catalytic converters and exhaust components and systems. We can only achieve our customer's goals by expecting the best from our suppliers. We ask you, our supplier, to join us in providing the best products with respect to quality, delivery, and price. We believe a strong supplier base is imperative for us to provide a World Class Product to our customers.

To ensure our supplier's quality systems conform to Vconverter's quality system requirements, Vconverter representatives may visit your facility in order for us to review your quality systems as well as manufacturing capability and capacity. The team's objective is to support the development of future mutual goals for our organizations. As a Vconverter supplier, we ask that you have a representative dedicated to providing the most up to date information available to build and continue to build an enduring business relationship.

Supplier Selection

New suppliers using the Vconverter Supplier Survey (VF-007). Based on the survey Vconverter may approve the supplier, request an on-site visit, or eliminate the supplier from further consideration. Supplier Evaluations typically include:

1. Product Costs
2. Product quality
3. Delivery performance
4. Quality Systems Certifications
5. Customer Requirements (Customer Directed sources)
6. For existing supplier scorecard performance

These overall evaluations categorize the supplier into one of the following groups.

1. Approved – given priority sourcing
2. Unapproved – May or may not be sourced with but additional requirements such as increased inspection, onsite reviews, etc

Engineering Changes

When an engineering drawing or engineering specification has been revised, Vconverter will send a copy of the drawing. The supplier should review the drawing and respond how the change will affect their production and/or inventory. The last 2 digits of the part number represent the rev level of the drawing. The supplier should respond within 5 working days, if there are any feasibility issues or exceptions needed to the drawing.

Certifications

Suppliers are required to submit dimensional, material composition, plating, or heat treat certifications as applicable with each shipment.

Production Part Approval Process (PPAP)

First production is performed by the supplier in accordance with the drawing / part number specified on the purchase order. A level 3 PPAP is required for each part in production unless otherwise specified or agreed upon. The PPAP documentation should follow AIAG guidelines with the following elements:

1. Design Records

A printed copy of drawing needs to be provided. If the customer is responsible for designing, this is a copy of customer drawing that is sent together with the Purchase Order (PO). If supplier is responsible for designing this is a released drawing in supplier's release system. "Each and every feature must be "ballooned" or "road mapped" to correspond with the inspection results (including print notes, standard tolerance notes and specifications, and anything else relevant to the design of the part).

2. Authorized Engineering Change (note) Documents

A document that shows the detailed description of the change. Usually this document is called "Engineering Change Notice", but it may be covered by the customer PO or any other engineering authorization.

3. Engineering Approval

This approval is usually the Engineering trial with production parts performed at the customer plant. A "temporary deviation" usually is required to send parts to customer before PPAP. Customer may require other "Engineering Approvals".

4. DFMEA

A copy of the Design Failure Mode and Effect Analysis (DFMEA), reviewed and signed-off by supplier and customer. If customer is design responsible, usually customer may not share this document with the supplier. However, the list of all critical or high impact product characteristics should be shared with the supplier, so they can be addressed on the PFMEA and Control Plan.

5. Process Flow Diagram

A copy of the Process Flow, indicating all steps and sequence in the fabrication process, including incoming components.

6. PFMEA

A copy of the Process Failure Mode and Effect Analysis (PFMEA), reviewed and signed-off by supplier and customer. The PFMEA follows the Process Flow steps, and indicates "what could go wrong" during the fabrication and assembly of each component.

7. Control Plan

A copy of the Control Plan, reviewed and signed-off by supplier and customer. The Control Plan follows the PFMEA steps, and provides more details on how the "potential issues" are checked in the incoming quality, assembly process or during inspections of finished products.

8. Measurement System Analysis Studies (MSA)

MSA usually contains the Gauge R&R for the critical or high impact characteristics, and a confirmation that gauges used to measure these characteristics are calibrated.

9. Dimensional Results

A list of every dimension noted on the ballooned drawing. This list shows the product characteristic, specification, the measurement results and the assessment showing if this dimension is "ok" or "not ok". Usually a minimum of 6 pieces is reported per product/process combination.

10. Records of Material / Performance Tests

A summary of every test performed on the part. This summary is usually on a form of DVP&R (Design Verification Plan and Report), which lists each individual test, when it was performed, the specification, results and the assessment pass/fail. If there is an Engineering Specification, usually it

is noted on the print. The DVP&R shall be reviewed and signed off by both customer and supplier engineering groups. The quality engineer will look for a customer signature on this document. In addition, this section lists all material certifications (steel, plastics, plating, etc.), as specified on the print. The material certification shall show compliance to the specific call on the print.

11. Initial Sample Inspection Report

The report for material samples which is initially inspected before prototype made

12. Initial Process Studies

Usually this section shows all Statistical Process Control charts affecting the most critical characteristics. The intent is to demonstrate that critical processes have stable variability and that is running near the intended nominal value.

13. Qualified Laboratory Documentation

Copy of all laboratory certifications (e.g. A2LA, TS, NABL) of the laboratories that performed the tests reported on section 10.

14. Appearance Approval Report

A copy of the AAI (Appearance Approval Inspection) form signed by the customer. Applicable for components affecting appearance only.

15. Sample Production Parts

A sample from the same lot of initial production run. The PPAP package usually shows a picture of the sample and where it is kept (customer or supplier).

16. Master Sample

A sample signed off by customer and supplier, that usually is used to train operators on subjective inspections such as visual or for noise.

17. Checking Aids

When there are special tools for checking parts, this section shows a picture of the tool and calibration records, including dimensional report of the tool.

18. Customer-Specific Requirements

Each customer may have specific requirements to be included on the PPAP package. It is a good practice to ask the customer for PPAP expectations before even quoting for a job. North America auto-maker's OEM (Original Equipment Manufacturer) requirements are listed on the IATF website.

19. Part Submission Warrant (PSW)

This is the form that summarizes the whole PPAP package. This form shows the reason for submission (design change, annual revalidation, etc.) and the level of documents submitted to the customer. There is a section that asks for "results meeting all drawing and specification requirements: yes/no" refers to the whole package. If there are any deviations the supplier should note on the warrant or inform that PPAP cannot be submitted.

Note:

Production part approval must be submitted for all changes as indicated in AIAG PPAP 4th edition manual. Email Change Requests to Vconverter's Quality Representative and PPAP submission level will be returned.

Special Characteristics

The Table below describes the Special Characteristic designations used on Vconverter drawings.

Description	Characteristic Symbol	Definition
SIGNIFICANT CHARACTERISTIC	<SC>	Significant Characteristics have no impact to safety or legal requirements and are required to maintain a 1.33 CpK during ongoing production
CRITICAL CHARACTERISTIC (CC)(With Safety or Legal Consideration)	<CC>	Critical characteristics have legal and safety requirements and are required to have 1.67 CpK during ongoing production. GBD is considered a critical characteristic.
Process Characteristic	<PC>	Characteristic that is crucial to our process and can impact assembly at our facilities. and are required to maintain a 1.33 CpK during ongoing production The characteristics that affect GBD would be process characteristics.
Pass Thru Characteristics	<PTC>	characteristics that will not be measured/verified at V converter but will impact final assembly/use at the customer
High Impact Characteristics	<HIC>	Characteristic that in the event of failure excessive loss will result. (i.e. Engine will be damaged and scrapped as a result of this characteristic being out of tolerances)
Operator Safety Characteristics	<OS>	Characteristic that in the event of failure an operator performing the assembly could be placed in an unsafe condition.

Deviations from Specifications

Nonconforming parts are NOT to be shipped without prior written approval from Vconverter's Quality Assurance. The supplier must complete a Request for Deviation form (Appendix D) and submit it to Vconverter's Quality Assurance. If the Request for Deviation is approved, then the signed form will be returned back to the supplier. Verbal agreements are not acceptable under any circumstance.

Non-Conforming Material

The supplier will be notified of nonconforming material by use of a supplier chargeback form VF-019. The supplier has 5 days to dispute the charges. The supplier may be responsible for damaged caused to Vconverter's property as a result of the discrepant material. Standard per costs for sorting are \$30.00 and \$50.00 for rework.

Corrective Action Request (CAR)

Vconverter will notify the supplier of a part's nonconformance with a Corrective Action Request (CAR). A CAR may be issued for a part as a result of receiving inspection rejection, defective parts in stock or found defective during our assembly process or failure by the supplier to meet our delivery requirements. Initial containment response is required within 24 hours. Corrective action is expected in 10 business days, unless the supplier requests an extension due to implementation requirements.

Delivery Requirements

The supplier will adhere to formerly accepted ship dates as specified on the purchase order. The acceptable window of delivery is no later the delivery date specified on the purchase order. The supplier is responsible for proper transportation to ensure product is delivered to meet the agreed delivery dates. All missed shipments must be expedited at the supplier's expense. All shipments must be accompanied by a packaging slip and/or shipper documents. That document must include the following at a minimum:

1. Supplier name
2. Vconverter Part number
3. Quantity
4. Date Shipped
5. Purchase order number

IMDS / Chemical Substance Guidelines

All suppliers are required to comply with the Global Automotive Declarable Substance List. The substances are available at www.gadsl.org. To comply with Vconverter customer requirements, you may be requested to submit International material safety data sheets through www.mdssystem.com.

Vconverter IMDS company code: **99102**

Supplier Scorecard

Vconverter will rate each supplier on PPM, Quality Concerns and Responsiveness to Quality Concerns, and Delivery. The scorecard is based on a 100 point system. Each category will have a designated point value. The scoring is as follows:

PPM Rating (35 pts)			Concern Rating (25 pts)			Delivery Rating (30 pts)		
Pts		PPM	Pts		Concerns / Late Responses	Pts	Delivery Percentage	If Low Volume: Late Shipments
35	≤	100	25	≤	1	30	≤ 98%	0
30	≤	200	20	≤	2	25	≤ 96%	1
25	≤	300	15	≤	3	20	≤ 94%	2
20	≤	500	10	≤	4	15	≤ 92%	3
15	≤	1000	5	≤	5	10	≤ 88%	4
10	≤	1500	0	>	5	5	≤ 84%	5
5	≤	2000				0	> 84%	6
0	>	2000						

Each supplier will receive 5 pts for having current TS-16949 or ISO 9001:2008 registration status and 5 pts for current ISO 14001 registration status.

Supplier Score (90% - 100%)

There are only very light or there are no problems. These suppliers are approved as a fundamental supplier.

Supplier (80% - 89%)

There were problems by these suppliers, but they are approved as a supplier. The supplier is restricted. The quality and the procurement reports must be reviewed and the problems must be solved within 6 months.

Supplier (less than 80%)

There are main problems by these suppliers. There is only a restricted approval - probation. The supplier must submit an action plan for eliminating the problems within 3 months. If there is not a significant improvement after the 3 months' interval the supplier will be recommended for removal from the list of approved suppliers.

The supplier scorecard will be sent to suppliers each quarter, or at the request of the supplier.