



A **DOVER**™ COMPANY

Supplier QualitySM Manual (SQM)

November 2020 Edition

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1. Introduction

This Supplier Quality Manual (SQM) has been created to assist our suppliers in understanding the purchasing expectations and quality requirements for products and/or services supplied to Vehicle Service Group (which we will refer to as VSG, in this SQM).

This Supplier Quality Manual will communicate the operating principles, general expectations, and documented information of VSG. In addition to the contents of this manual, VSG suppliers shall comply with the Dover Corporation Supplier Code of Conduct, a copy of which can be found at www.dovercorporation.com under the Governance section.

Adherence to the guidelines described in this manual is required of all VSG suppliers. Acceptance of any and/or all purchase orders constitutes acceptance and commitment on behalf of the recipient to comply with this manual's content.

These guidelines are provided as supplement to, and do not replace or alter, any purchase agreement terms and conditions which are included as requirements of applicable drawings, specifications and other contractual documents.

This manual describes the minimum requirements for which the supplier has responsibility. However, system improvements that exceed the requirements specified within this manual are always encouraged.

2. Supplier Approval Process

VSG evaluates and approves new suppliers based on their ability to meet our requirements. The selection process is initiated by the Purchasing Department. An Approved Vendor List (AVL) is maintained and updated. VSG will purchase production and service components and raw materials from only those suppliers on the AVL.

➤ *Approved Supplier Criteria*

Criterion for addition to the AVL includes, but is not limited to:

- QMS certification * latest revision ISO9001, IATF16949, AS9001
- Quality/Delivery Performance History
- Financial Stability
- Capacity
- Lead Times
- Cost
- Payment Terms

Note: Substandard performance in any of the above areas can result in the supplier being removed from the AVL or placed in suspension. During active suspension a supplier is ineligible for new business opportunities until they improve their performance.

3. Quality Management System (QMS)

Management Responsibility

The supplier's executive management shall define and document the policy for quality, along with its policy for risk assessment and opportunities, in the quality management system. These policies shall be understood, implemented and maintained at all levels of the organization.

Responsibilities for personnel, who manage perform and verify work affecting quality shall be defined and documented. The supplier personnel must be made aware of their contribution to product safety, product or service conformity, and understand the importance of ethical behavior.

A management review of the quality system shall take place at regular intervals to insure its effectiveness. Additionally, a process for determining customer satisfaction shall be documented and supported by objective evidence.

The supplier's facility shall maintain a state of order and cleanliness appropriate to the products manufactured for VSG.

Quality Documented Information

The supplier shall establish and maintain the use of documented information

that ensure that product or services conform to the customer requirements, expectations and satisfaction from product quality. As well as, assure the meeting of all internal organizational requirements defined by management.

Examples of such documentation:

- Ensure that the organization can meet manufacturability and quality requirements of the parts supplied to its customers.
- Provide evidence that the customers engineering design record and specific requirements (key characteristics) are understood and fulfilled by the organization.
- Demonstrate that the established manufacturing process, has the potential to produce the part that consistently meets all requirements during the actual production run, at the quoted production rate of the manufacturing process.

Production Verification / Part Approval Process

VSG has adopted the AIAG Production Part Approval Process (PPAP) as our foundation for part/process approval. The PPAP process is recognized as an industry standard, and we believe this will help suppliers understand and meet VSG expectations. This procedure applies to all external providers of raw materials, components, finished product or services that impact the quality of products that are manufactured and / or marketed by VSG.

Suppliers may have a few questions, so below we will highlight our process. All suppliers should ask their purchasing representative, or their quality representative should any questions arise. The list below is not all inclusive so please be sure you ask for the most recent procedure for PPAP.

- When submission is required - The need to evaluate a new or modified raw material, component, finished product or service is identified by Purchasing, Technology, Engineering, Operations and/or Suppliers. Part/process verification is required prior to the first use of product as follows:
 - A new part, product, service not previously supplied to VSG
 - Correction of a discrepancy on a previous submission.
 - Product modified by an engineering change.
 - Production following any change in process, manufacturing method, or material differing from previously approved part.
 - Production from new or modified tools, dies, molds, patterns, etc., including additional or replacement tooling.
 - Production from tooling and equipment transferred to a different plant location.

- Change of source for subcontracted parts, materials or services.
 - Product re-released after the tooling has been inactive for volume production exceeded twelve months.
- Requirements for Part Verification / Process Approval- VSG's Quality Department conducts the review and approval based on analysis of the documentation and samples provided by the supplier, the submitted parts must be manufactured according to the following:
- Production parts must be manufactured at the intended production site using the production tooling, gauges, processes, materials, operators, environment and process settings.
 - Parts must be taken from significant production run, typically from one hour to one shift's production. Parts from each position of a multiple cavity die, mold, tool or pattern are to be measured and representative parts tested.
 - Prior to Approval, the following documents and items must be completed for each part manufactured:
 - All design records, part drawings, and specifications
 - Country of Origin documentation.
 - Dimensional results referenced to the part drawing.
 - Material, performance and durability test results as specified on the print.
 - Process Flow Diagrams
 - VSG may also require, at their discretion:
 - Control Plans or equivalent including all product and processes with significant characteristics
 - Process capability results showing conformance for significant characteristics, with supporting data such as control charts
 - Disclosure of
 - any conflict materials
 - Related Safety Data Sheets
- Submission Requirements- Documentation level and the number of samples required for each submission will be defined by VSG quality. For each submission the completed document package should be emailed to VSG-SupplierDocs@vsgdover.com and paper copies should be shipped with the product sample. The typical submission will be a Level 2 PPAP. Level 3 is always acceptable. Level 2 will include a Statement of conformance (PSW), a dimensional report keyed to a balloon noted VSG drawing, material certifications, coating/plating certifications, and a process flow diagram. Other items that may be required include:
- Auxiliary Drawing and Sketches - must include the part number change level, drawing date and supplier's name
 - Part Specific Inspection or Test Device -required reporting needed to certify that all aspects of the inspection devices agree with the part requirements.

- Customer Identified Significant Characteristics - verification that significant characteristics, such as those that affect safety, compliance with regulations, form, fit, function or appearance are communicated on supplier documents. These are identified with the symbol ○
- Quality may also require, at their discretion - Process Capability Studies - an acceptable level of process capability must be determined prior to submission for all characteristics designated by VSG or supplier as Significant. If capability studies cannot be completed, alternative methods must be pre-approved by VSG.

Dimensional Evaluation - must be performed on all parts and product materials with dimensional requirements (except reference dimensions), characteristics and specifications to determine conformance with all relevant design record specifications.

- Results are to be listed on a convenient format with the actual results recorded and date measurements were taken.
- When third party inspection services are used, the results must be submitted on their letterhead, indicating their name.
- A marked-up print with the dimensions marked to correspond with the dimensional form must be included.
- Material Testing - must be performed as required by the drawing for all parts and product materials, when chemical, physical, metallurgical requirements are specified.
- If the supplier cannot perform the required tests, services must be procured from a qualified source.
- When third party inspection services/laboratories are used, the results must be
- submitted on their letterhead, indicating their name.
- Documentation must include:
- Quantity tested and the results
- Design record and specification change level, and date
- Material supplier's name (sub-contractor)

Performance Testing-must be performed as required by the drawing and performance/functional testing specifications

- If the supplier cannot perform the required tests, services must be procured from a qualified source.
- When third party inspection services/laboratories are used, the results must be submitted on their letterhead, indicating their name.
- Documentation must include:
- Quantity tested and the results
- Design record and specification change level, and date

Multiple Cavity Molds, Tools, Dies and Patterns - a complete dimensional evaluation is required on parts from each cavity, mold, etc. The supplier must identify the specific cavities, molds, etc.

The inspection and testing requirements may be determined by the extent of the change. For example, if certain dimensions are changed, the dimensional evaluation may be limited to

those areas affected by the change

The quality department retains discretion to adjust submission requirements in extreme cases, but as a general guide submission may be grouped into 3 classifications:

- Class1- Off the shelf/non-critical items will require one sample and Level 2 PPAP excluding the process flow.
- Class 2- General service items will require 5 samples and a Level 2 PPAP package as outlined above.
- Class 3- Critical/Precision items- will require 10 samples along with a Level 2 submission package. However, VSG may require heightened documentation and reporting of values for significant characteristics on 30 samples.

Part Submission Status - Suppliers will be notified by VSG as to the disposition of the submission. After sample approval, suppliers are responsible for assuring that future production continues to meet all requirements.

Production Approval indicates that the submitted documentation and samples demonstrate the process outputs are acceptable for use. The supplier is therefore authorized to ship production quantities of the part/material subject to releases from VSG scheduling activity.

Interim Approval permits shipment of parts/materials for production requirements on a limited time or piece quantity basis.

Interim approval will only be granted when the supplier has prepared an interim approval action plan agreed upon by VSG. Resubmission to obtain production approval is required unless the supplier is advised that VSG has revised the drawings or specifications to agree with the parts as manufactured.

Parts/Materials covered by an interim approval that fail to meet the agreed upon action plan will be rejected. No additional shipments are authorized unless an extension is granted.

Rejected means that the submission, the production lot from which it is taken, and accompanying documentation must be corrected, re-submitted and approved before production quantities may be shipped.

Records & Master Sample Retention

The supplier shall retain a complete record of findings for each submission including any SPC results and when applicable, the corresponding approval.

- The record must show conformance to all dimensional, chemical, metallurgical, physical and other test specifications. Documentation required in this record includes copies of inspection results referenced to and accompanied by the customer's engineering approved design record for all dimensional requirements.
- Laboratory test reports covering all chemical, metallurgical, physical, and performance tests specified for the material and part.

- Preliminary process capability results for all Significant Characteristics.
- **Special Processes:** Special processes require additional certification to VSG include welding, heat treat, soldering, and plating (coatings).

Example: VSG welding conforms to AWS D1.1. and VSG expects suppliers to also weld according to AWS D1.1.

Suppliers need to identify any processes that would be defined as special and ask their VSG purchasing representative and their quality representative what the standard they need to conform to.

- Records for part Verification Process approval are to be maintained for the length of time that the part is active for production and service requirements plus one calendar year.
- Master samples or boundary samples, when determined to be needed by VSG QC, must be retained for the same period as the Part verification process records or until a new master sample is approved for the same part number. Master samples are to be identified as such and are to show the approval date.

Control of VSG-Supplied Product

The supplier shall establish and maintain a system for the control, storage and maintenance of VSG-supplied product provided for use into their manufacturing workflow. Product that is lost or unsuitable for use should be reported to the VSG immediately.

- *VSG-supplied (owned) product includes, but is not limited to:*
 - Returnable packaging material, containers or bins
 - Consigned material

Direct any questions concerning the determination of VSG supplied product to the appropriate VSG plant's Commodity Managers.

Transfer/Outsource of Tooling

Transfers of tools, molds, or other equipment to any other location or outside source shall be approved in advance by the VSG receiving facility in writing. That equipment shall be closely monitored by both parties to ensure a smooth transition which meets the requirements of VSG and the VSG customer

impacted by the transfer.

- Tools must be maintained in good condition
- Tools owned by VSG must be marked stating such
- Any damage to a tool must be reported to VSG immediately
I.E: Die crash, Tool drop, excess wear

Product Identification and Traceability

The supplier shall establish and maintain documented information for identifying the product by suitable means from receipt of the product and during all stages of production, delivery and installation. This includes any product that may have an expiration date or shelf life.

Process Control

The supplier shall determine and control any relevant product or process characteristics and conditions, for their production processes, which directly affect product quality.

Suppliers are encouraged to implement mistake-proofing strategies such as fixtures, automation, color-coding, poke-yokes. If such items cannot be implemented, then adequate inspection must be implemented to assure the part quality.

The supplier shall maintain documented information, for all employees that have responsibility for operation of processes. Job set-ups shall be verified whenever a set-up is performed.

VSG must be notified for guidance on approval requirements for any changes to the manufacturing process, prior to the change being implemented.

Preventive Maintenance

A preventive maintenance program is encouraged which includes, as a minimum:

- A procedure that describes planned maintenance activities
- Scheduled maintenance activities

- Predictive maintenance methods
- Availability of replacement parts for key manufacturing equipment

Appearance Items

Suppliers that manufacture parts where appearance items are significant (i.e. paint, casting, forming and other applicable processors), shall provide:

- Appropriate lighting for inspection of parts (min. 1075 Lux or 100-foot candles)
- Masters for color, texture, and other visual features may require additional VSG approved boundary samples to be retained.
- Maintenance/control of appearance masters, boundary samples, evaluation equipment and appropriate written appearance standards
- Verification that personnel making appearance evaluations are qualified to do so

Any cosmetic abnormality will require VSG approval, prior to shipping even if not a functional concern.

Inspection and Testing

➤ *In-process Inspection*

Sufficient control shall be maintained over manufacturing processes to prevent excessive product variability and to assure conformance of the characteristics of product which can be verified only at the time and point of manufacture:

- Characteristics defined by VSG as a critical or safety-related shall be closely monitored.
- Documented Information shall be accessible at each station or via computer.
- Visual inspection aids should be available to plant personnel and the repetitive non-conformances shall be highlighted on the visual aids.

Audit and Verification

VSG will have potential suppliers conduct an *Initial Supplier Assessment*. The self-assessment is a VSG document that will be provided to prospective suppliers by the VSG supply chain team. This self-evaluation seeks information typical quality functions. This survey gages the supplier's quality systems and gives VSG personnel a method to plan for any subsequent visits.

Depending on the nature of the product or service being provided, VSG may implement action items up to and including an onsite assessment by a VSG SQE. Suppliers may also be visited by engineering and supply chain managers. While these teams may have their own focus, they will also have the ability to question the supplier about quality performance and quality systems.

VSG reserves the right to conduct periodic surveillance audits to ensure QMS maintenance. Further, for chronic and/or recurring issues, the supplier will grant VSG access to their production facility based on a previously agreed date. The visit will be of adequate extent and the supplier will provide VSG an appropriately qualified associate for support. The supplier is responsible for optimizing any agreed weaknesses, and for submitting an action plan for those weaknesses, discovered during the VSG visit. Additionally, if deemed necessary the supplier shall allow VSG access to its sub-suppliers and the right to audit any sub-supplier if warranted.

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Measurement and Calibration Testing

A calibration system shall be used for all inspection instruments and testing equipment.

All measuring devices or equipment should bear an indicator, which verifies the current status.

Certified standards and methods (traceable to national standards) shall be used when validating or recalibrating measurement devices. Records of calibrations must be maintained as noted in applicable ISO standards.

Supplier are encouraged to assure that gage repeatability and reproducibility (GR&R) studies are conducted that show evidence of suitability, for the type of device.

Revisions to the fixture / gauge, will be traceable to part and drawing changes, if applicable.

Control of Nonconforming Product

The supplier shall establish and maintain a system to ensure that nonconforming and suspect product is prevented from unintended use or processing. This system must provide for identification, documentation, evaluation, segregation and disposition of nonconforming product.

The supplier shall provide visual identification for any nonconforming or suspect material/product and any quarantine areas.

In-process nonconforming product must be appropriately tagged, segregated from good product, and shall be removed from the production area to a designated location for rework or material review.

Review and Disposition of Nonconforming Product

The responsibility for review and authority for the disposition of nonconforming product shall be defined.

Sorting or Rework of Nonconforming or Suspect Product

When product must be sorted or reworked, the preferred method is to return product to the supplier for sort/rework at the supplier's location.

Sort/rework completed on VSG's premises requires plant quality department approval.

Regardless of the arrangement, the VSG quality department and commodity team need to be involved.

The reworked parts must be identified and able to be audited by a VSG quality representative to assure conformance to standards.

VSG will initiate cost recovery when sorting/rework by VSG personnel is required to maintain production.

Authorization of Temporary Change of Material or Process

The supplier shall not make any changes to material, packaging, processing, or

other aspect that may affect product quality, or deviate from original approved specifications without explicit written authorization from the appropriate VSG personnel.

Corrective and Preventive Action

When a supplier is notified of a nonconformance by VSG representative, the following minimum corrective actions need to be taken:

- **Immediately:** *Containment of the problem:*
 - In-House product
 - Work-in-process
 - Product in transit
 - Product at subcontractor's facility
 - The next 3 shipments confirmed to be defect free after the initial quality reject
- Within 72 hours: *Provide disposition*
 - Of nonconforming and/or suspect product
 - Response of interim corrective action
 - Method to identify certified shipment of product that meet the VSG requirements
- **Within 10 working days:** Documented permanent *Corrective Action Plan*

Suppliers shall document corrective actions using the VSG corrective action form. This form requires the following to be addressed.

- Description of problem
- Identification of root cause
- Interim corrective actions (with dates of implementation)
- Permanent corrective actions (with dates of implementation)
- Verification of permanent corrective actions (with date verified)
- Prevention methods

Returned products shall be analyzed and customer concern information collected to effectively determine the root cause of the problem and how to prevent it from recurring. Use of statistical tools such as, Pareto Analysis, Cause and Effect Diagrams and Control Charting should be employed, as appropriate.

As required, the supplier will send the necessary representatives to the VSG receiving location or VSG Product's customer to provide support in solving issues resulting from the nonconformance.

Additionally, when chronic, recurring and/or customer-related issues

occur; VSG reserves the right to place suppliers on 3rd Party Containment that the supplier is responsible to manage

➤ *Risk Prevention*

Appropriate sources of documented information which affect product quality, audit results, quality records, service reports and customer complaints will be used to detect and eliminate risk.

Documented Information on risk determination will include a method to identify, communicate, isolate and eliminate potential risks.

➤ *Reimbursable Out of Pocket costs*

When quality or delivery issues impact VSG's production capabilities or impact the end customer due to a supplier's nonconformance, VSG reserves the right to submit claims to the supplier and recoup those related costs.

- If the non-conformance causes VSG to incur out-of-pocket costs directly attributable to the non-conformance and the out-of-pocket cost is valued at more than \$500, then a claim may be prepared which may include any of the following cost elements:
- VSG fully burdened direct labor to shut down and restart production machinery.
- The value of material scrapped at delivered cost to VSG less any salvage value recovered.
- Machine downtime as a result of a late delivery or premium labor to recover lost time to meet a customer delivery.
- The cost of paying a penalty or premium to a customer caused by the supplier's late delivery.
- Handling and return freight.
- Third party costs as for example lab and testing fees to determine cause of a cable failure to support a claim.
- The cost of 'cover' to provide replacement material

Warranty

VSG expects timely support in the analyzing and developing countermeasures for warranty or field failure issues. Suppliers of parts that are purchased for resale by VSG assume no less than the same warranty that VSG provides to each of its customers. VSG will contact each supplier as necessary, and return warranty parts, when feasible, for credit. Suppliers who are exceptions to this policy are those who have their own, signed agreement with VSG specifically addressing their warranty program.

Packaging, Handling and Labeling

➤ *Packaging and Handling*

Packaging requirements for all components and raw material shall start during the initial quoting process. Unless otherwise specified, all suppliers are required to submit packaging information, with their quote, to the appropriate buyer.

All packaging must provide the appropriate amount of protection against damage, contamination, and any other defect that will cause a rejection at VSG or our external customers. It is the supplier's responsibility to ensure that packaging has been designed and constructed to fulfill this requirement and that it meets the requirements of VSG.

NOTE: If packaging has been designated by VSG, it is the supplier's responsibility to sign off on all packaging designs as fit for use and ensure that the appropriate packaging material is utilized with the designated product. Any deviation from using the intended packaging or container should be approved (in writing) by the VSG receiving facility. If packaging (designed by VSG) is insufficient for use, it is the supplier's responsibility to notify the VSG buyer in writing.

All packaging changes must be submitted to - and approved by - a VSG Buyer. A brief explanation of the need for the change, along with any other pertinent information should accompany the request.

The supplier shall provide methods of handling product that prevent damage or deterioration.

➤ *Labeling*

Labeling must conform to any the VSG designated guidelines. All material identification labels, or tags must remain intact from the original point of manufacture, through VSG's receipt and at the affected receiving location. All labels must include the VSG part number clearly on them. For returnable containers, old labels must be removed or covered, to ensure that product identification is maintained.

Training

The supplier shall establish and maintain documented information which identify

and provide for the training of all personnel performing activities affecting quality.

Suppliers that supply product where appearance items are defined are also required to demonstrate training of personnel performing visual inspection activities to the VSG.

As appropriate, suppliers shall determine the need for statistical methods required for controlling and verifying process capability and product characteristics. Basic statistical tools should be utilized, when applicable, to maintaining process consistency.

Statistical Methods

As appropriate, suppliers shall determine the need for statistical methods required for controlling and verifying process capability and product characteristics. Basic statistical tools should be utilized, when applicable, to maintaining process consistency.

On-Time Delivery

VSG requires all suppliers to meet their on-time delivery requirements. To further clarify this, we consider unauthorized early and unauthorized late and partial deliveries or over shipments to be unacceptable. The quantity shipped per order or release cannot vary from specified quantity without prior written (or Email) consent.

4. Supplier Performance

VSG monitors supplier performance, to:

- a) determine those suppliers who need assistance
- b) recognize outstanding supplier performance, and
- c) promote continual improvement throughout the supply base.

Suppliers are rated by the following metrics:

- Quality
- Cost
- Delivery

Supplier Acknowledgement Section:

All suppliers are required to read this manual and assure your QMS adheres to the minimum guidelines outlined in this manual. You are free to ask for clarification on any item you do not understand.

Supplier Operations Manager: Print name / Sign name / Date

Name _____ Date: _____

Supplier Purchasing Manager: Print name / Sign name / Date

Name _____ Date: _____

Supplier Quality Manager: Print name / Sign name / Date

Name _____ Date: _____

Email a scanned copy of this form to: Determine who would get these?