SUPPLIER QUALITY MANUAL

Document Control Coordinator: /s/ Shane Kelley	Date of Issue: 8/11/2020
Owner & Date : /s/ Luca Bologna 8/10/2020	DA#: 20-040

Document Information

Document Number	Revision	Revision Date:
SQM	A	April 25, 2013
SQM	B	August 1, 2014
SQM	C	April 10, 2018
SQM	D	November 28, 2018
SQM	E	June 10, 2019
SQM	F	August 11, 2020

Table of Contents

SECTION 1: INTRODUCTION

1 Preface

Miltope's success is based on the quality and performance of the products and services provided to our customers, which is impacted heavily by the products and services that we, in turn, receive from our suppliers. Because of this, Miltope views our supply base as an integral part of the business and as key partners of the Supply Chain. The capabilities of our suppliers support the fulfillment of the Miltope Quality Policy and the achievement of company objectives. Relationships with our suppliers are built on total quality principles and practices to achieve the best performance, delivery, service and total cost. As such, all suppliers must abide by the policies set forth in this Supplier Quality Manual.

2 Quality Policy

Miltope Quality Policy

We at Miltope are committed to developing loyal, satisfied customers by meeting their expectations and requirements through our dedication to the continual improvement of our Quality Management System and the products and services we offer.

3 Purpose

This Supplier Quality Manual (SQM) establishes general policy and outlines the minimum quality requirements which the supplier shall establish, document and implement in order to be approved as a Miltope supplier. The requirements within this manual are provided as a supplement to, and do not replace or alter the terms or conditions within Miltope (herein referred to as "the organization") supply and purchase documentation, engineering drawings and/or specifications.

4 Scope

This manual applies to all suppliers of production materials, products, or services to the organization.. Suppliers must ensure that their suppliers also comply throughout the supply chain.

5 Responsibilities

The organization's Procurement department is responsible for SQM implementation and assurance that all suppliers meet and fulfill the requirements herein.

Suppliers are responsible for ensuring that the products and/or services provided meet the established requirements and assume full responsibility for the quality thereafter. ***Approval and verification of supplier's facilities, systems, records and product does not in any way relieve the supplier of the responsibility and obligation to provide product that meets all of the organization's specifications and requirements and all other contractual terms and conditions, as well as all applicable laws and regulations, nor shall it preclude subsequent rejection by the customer. Please note that these requirements correspond with the organization's customers, as well as the AS9100D, Clause 8.4.3, which addresses supplier's contribution to product conformity, product safety and the importance of ethical behavior.***

6 Confidentiality

The organization may share proprietary or confidential information with the supplier in the normal course of business. The supplier shall treat all data in strict confidence and report any intentional or non-intentional breach of confidentiality to the organization management immediately based on the applicable Non-Disclosure Agreement (NDA). The supplier is responsible for maintaining proper control of all drawings and specifications provided by the organization, and all drawings and specifications shall be treated as the organization's property.

7 Objectives

The organization has the following expectations of all its global supplier partners. The supplier partner shall:

7.1 Provide 100% conforming parts/services with 100% on-time delivery.

7.2 Continually strive to enhance product quality and manufacturing productivity to meet increasing competitive pressure in our global economies.

7.3 Provide all documentation and information in English to ensure documents are transferable and understood within all of the organization's facilities. This requirement is for all requests for records and documentation submitted to the organization as specified in this manual.

7.4 Support the organization in addressing field failures related to the supplier's product/service to include financial reimbursement and customer support.

7.5 Maintain a work environment needed for the operation of its processes and achieve conformity to product by considering the potential impact of human factors, and provide organizational knowledge and training to personnel.

7.6 Demonstrate advanced quality planning to foster continuous improvement, defect prevention, and process optimization. Preferred Quality Planning methods may include, but are not limited to:

- Design and Process Failure Mode and Effects Analyses (FMEA's) to document the completeness and effectiveness of design and manufacturing process controls.
- Process flow charts.
- Control plans incorporating process controls to prevent, detect and/or correct manufacturing defects before finished products are shipped.
- Operator and inspection instructions which eliminate non-productive steps attempting to inspect quality into the supplied materials.

- Measurement system analysis, process capability analysis, statistical process control, and other statistical methods.

- Root cause analysis, corrective action, and preventive action.

8 Approval

8.1 Suppliers will be evaluated and selected on their ability to meet:

8.1.1. The organization's Supplier Quality System requirements and other approval processes, per SECTION 2 of this manual, and;

8.1.2. The Production Part Approval Process (PPAP), per SECTION 3 of this manual.

8.2 As necessary, a supplier may be approved for use outside of the normal and expected qualification and approval process, as defined within this manual. Specific justification for departure from the SQM must be provided and approved via form QA-13-F003, Request for Deviation/Waiver.

8.2.1 Suppliers receiving a classification level of 1 or 2, must maintain third party registration to current ISO 9001, AS9100, or other recognized international quality system standard by an accredited registrar.

9 Record Retention Requirements

Quality records shall be maintained so they remain legible and are available for review upon request, and may be in any media such as electronic or hardcopy. Records should include accurate, updated, and complete quality data, including applicable international documentation, certificates of analysis (C of A), certificates of conformance (C of C), process documentation, or other information as applicable and required. Records shall be kept for defective components and assembly processes to highlight problem areas and trends.

Records of production parts and materials shall be maintained by the supplier per QA-157

Specific quality records generated as a result of this manual and the supplier qualification and PPAP processes will be retained historically by the organization as follows:

Quality Record	Where Filed	Indexed By	Responsibility	Retention
Supplier Approval Worksheet	Procurement	Supplier Name	Procurement	10 years *
Supplier Quality System Survey	Procurement	Supplier Name	Quality	10 years *
Supplier QMS Audit	Procurement	Supplier Name	Quality	10 years *
PPAP Results	Quality	Part Number	Quality	10 years **

* Retention period begins from the last date of receipt for the part but may be extended by customer requirement. Only the latest submission must be retained.

** Retention period begins from last date of receipt or latest PPAP submission for the part, whichever is later, but may be extended by customer requirement.

10 Warranty

Suppliers must have the capability of supporting defined life cycle requirements of the product and, as required, are expected to demonstrate reliability that meets and/or exceeds the organization's requirements. Suppliers must also participate in reducing the number of product warranty concerns and complaints. The supplier shall support the organization to track and analyze the causes of warranty claims and use the information gathered to improve their processes and product reliability. This will support enhanced customer satisfaction and continued business of the organization and our supplier partners.

11 Management of The Organization's Supplied Product and Equipment

11.1 All tools, manufacturing, test or inspection equipment belonging to the organization or the organization's customers shall be used exclusively for the organization's products unless otherwise authorized in writing.

11.2 All of the organization's capital assets must have an asset number for tracking. The supplier shall establish procedures for the permanent identification and tracking of the organization's supplied equipment including preservation of the asset number.

11.3 The supplier is responsible for proper handling, storage, maintenance and, for test and inspection equipment, calibration.

11.4 The Supplier shall notify the organization in writing of supplied equipment that is lost, damaged, or is otherwise unsuitable for use. The organization's supplied equipment shall not be discarded or disposed of without written authorization from the organization.

11.5 All of the organization's supplied product and material shall be promptly returned to upon request.

12 Packaging, Labeling, & Handling

12.1 In-process and finished products shall be appropriately packaged to protect from damage, to include appropriate electrostatic discharge (ESD) protection. Packaging shall meet applicable shipping laws, codes, and regulations. All shipments shall be packaged or placed in a new container unless otherwise approved by the organization. Packing slips shall be attached to the carton exterior in shipping envelopes.

12.2 The supplier shall ensure that all packaging is clean and free of dirt, debris, foreign materials, and damage. All returnable packaging and dunnage that is not clean and free of dirt, debris, foreign material, and damage may be subject to rejection.

12.3 Packaging shall be labeled in accordance with all of the organization's standards, unless otherwise specified. Each shipment shall be marked with the organization's part number, manufacturing part number, quantity, lot number, Miltope site name, address, gross weight in pounds, and any other specified requirements, as applicable.

13 Supplier Quality and Recognition

The organization strives to consistently offer quality parts and services at a good value, to lead design and technology, to drive continuous improvement and to provide consistent, quick delivery to the end user. These same guiding principles towards maintaining customer satisfaction and continuous improvement necessarily become a mutual goal of the organization and its supplier partners. Suppliers are accountable for product conformance, system and process compliance, and increased performance in a globally competitive environment.

As such, it is the organization's policy to support the development of its suppliers and to formally recognize its supplier partners for sustained excellence in performance and for continuing improvement.

14 Supplier Rating

Suppliers of products and materials will be monitored and measured on an ongoing basis in several key categories and criteria in accordance with the organization's work instruction QA-8.3-W004, Supplier Performance System. The criteria ratings are weighted to develop an overall numerical score. The resulting supplier rating is communicated to the supplier by the organization's Procurement via Supplier Report Card. Supplier ratings are monitored and tracked over time and evaluated by the organization's management for consistency and/or needed improvement.

15 Continuous Improvement

Suppliers are expected to demonstrate a commitment to continuous improvement in products and processes provided to the organization. Objective evidence of "self-development" may be requested, such as copies of revised procedures, updated training records, audit results, and statistical data. Emphasis should be placed on defect prevention rather than defect detection.

The organization encourages suppliers to implement business systems eliminating non-value added activity, while implementing mistake-proofing and cost avoidance/reductions. Cost reduction must be an integral part of the long-term success of the organization and its supplier partners in order to remain competitive and strong in the marketplace. Suppliers are expected to develop and maintain the ability to offer cost avoidance/reductions through effective implementation of value analysis and quality improvement programs.

16 Nonconformance and Corrective Action

16.1 Suppliers to the organization are expected to provide defect-free products and services. Nonetheless, when product or service issues occur, suppliers will support the organization, as necessary, with technical assistance and field support to rectify any substantiated nonconformance. The organization reserves the right to recover justified expenses from suppliers for performance failures related to quality or delivery issues.

16.2 Nonconformance:

16.2.1 Defective material or services may be identified at any point in the process, including incoming inspection, production use, assembly, testing, or packaging. Defects can also

be discovered during audits, surveillance, or validation by the customer, or through warranty claims.

16.2.2 Suppliers will be formally notified via supplier nonconformance report (SNCR) and/or supplier corrective action request (SCAR) upon detection of nonconforming material or service, or when late delivery results in a loss of productivity.

16.2.3 Nonconforming material discovered at the organization may be handled in any of the following manners, at the discretion of the organization:

16.2.3.1 Rejection of either individual components or the entire lot/shipment, and return to the supplier.

16.2.3.2 Use-as-is deviation initiated by Procurement or Quality and approved via the organization's form QA-13-F003, Request for Deviation/Waiver. Product cannot be shipped or consumed prior to deviation approval.

16.2.3.3 Sorted, reworked, or scrapped at an organization facility; supplier resource(s) and/or a third party resource may be required to support sorting and rework.

16.3 Corrective Action:

16.3.1 Upon receipt of a SCAR, the supplier shall provide a formal written response within the time frame specified.

16.3.2 The response shall document:

16.3.2.1 Containment action taken to prevent additional nonconformance at the organization and to replace nonconforming material with conforming material, as necessary. This may include material in supplier production, supplier inventory, in the distribution system, and/or at the organization.

16.3.2.2 Definition of the root cause of the nonconformance and the plan to implement permanent corrective action(s). It is strongly recommended that approval by the organization be obtained prior to implementing the proposed corrective action plan.

16.3.2.3 The date of implementation of corrective action, including any deviation from plan. The serial number, lot number, and/or effectivity date of the corrective action shall be provided to the organization, as well as other supporting data or documentation that may be requested.

16.3.2.4 Verification of the effectiveness of the corrective action, including objective evidence thereof.

SECTION 2: SUPPLIER QUALITY SYSTEM APPROVAL PROCESS

1. Introduction

The review of a supplier's quality system is critical to the overall approval process and provides the necessary evidence needed to ensure product and process integrity and continuous improvement. Suppliers must be capable of meeting quality, delivery, cost, and continuous improvement objectives and are evaluated for such.

2. Purpose

The purpose of this section is to define the Supplier Quality System requirements, which is the first step in the supplier approval process.

3. General Requirements

3.1. The organization's Procurement has overall responsibility for coordinating the qualification and approval process and is the primary point of contact for all communications relative to this process.

3.2. Supplier Quality System approval does not imply approval of the supplier's processes, parts, products or services. However, Supplier Quality System approval is a prerequisite to beginning the PPAP process per SECTION 3 of this manual.

3.3. Suppliers must establish, maintain, and demonstrate quality systems with supporting procedures to ensure that products and services conform to the organization's purchase agreements and product specifications at the supplier locations and throughout the supply chain.

4. Supplier Quality System Approval Initiation

4.1. The organization's Procurement initiates the supplier qualification and approval process by initiating the Supplier Approval Worksheet (PU-7.4-F005) form for completion by the supplier.

4.2. Upon notification, the organization's Procurement will provide the potential supplier with the SQM and Supplier Quality System Survey (QA-8.2-F084).

4.3. Upon receipt and initial review of the information provided back from the supplier, the organization's Procurement will initiate a review by the respective Integrated Supplier Team.

4.4. Based upon the evaluation of the information provided in the Supplier Quality System Survey, the Integrated Supplier Team determines if a potential supplier is an acceptable candidate to initiate the next step in the supplier qualification and approval process per SECTION 2, paragraphs 6 and 7 of this manual.

4.5. If the Integrated Supplier Team rejects the supplier as a candidate, the organization's Procurement will notify the supplier of this decision, thereby ending the approval process.

5. Supplier Quality System Requirements

5.1. Suppliers must establish, maintain, and demonstrate an effective QMS to ensure compliance to the organization's purchase agreements and QA-157

5.2. All suppliers must complete and submit a Supplier Approval Worksheet (PU-7.4-F005) and Supplier Quality System Survey (QA-8.2-F084) for review.

The supplier quality system may be required to provide traceability of products to raw materials or components used in the manufacturing process, production operation, date of manufacture, revision level and records of evaluation of acceptance and conformance. Products should have positive identification at all times to address traceability via lot numbers, production date codes or other means; as applicable.

6. Supplier Classification Levels

6.1. Suppliers will be assigned a designated classification (i.e. Level 1, 2 or 3) for part(s) or materials being supplied. The classification will be determined and assigned by the applicable Integrated Supplier Team and is based on a combination of the associated technical and business risks. This classification will be used to determine the level of assessment required for Supplier Quality System approval. The following table shows the classification levels:

TABLE 1 – SUPPLIER CLASSIFICATION MATRIX

	High Business Risk	**Medium Business Risk**	**Low Business Risk**
High Technical Risk	Level 1	Level 1	Level 1
Medium Technical Risk	Level 1	Level 2	Level 2
Low Technical Risk	Level 2	Level 3	Level 3

6.2. Supplier classification levels will be reviewed periodically by the applicable Integrated Supplier Team and may be subject to change based on any recent change in the type, complexity, or volume of parts or materials being supplied to the organization, or other factors including, but not limited to, financial stability or manufacturing capabilities.

7. Supplier Quality System Approval

7.1. New Level 1 Suppliers:

7.1.1. Completed Supplier Approval Worksheet (PU-7.4-F005), Supplier Quality System Survey (QA-8.2-F084), and approval by the Integrated Supplier Team. In addition, current third party registration to current ISO9001: and /orAS9100 is required A copy of the supplier's third party registration must be provided to the organization.

7.1.2. In the event a supplier's quality system registration status changes or is suspended, the supplier shall notify the organization within five (5) business days. The supplier may be audited by the organization and/or be required to provide documentation explaining the status change, including a plan for corrective action.

7.2. New Level 2 Suppliers:

7.2.1. Completed Supplier Approval Worksheet, Supplier Quality System Survey, and approval by the Integrated Supplier Team. In addition, current third party registration to most current ISO9001, AS9100 or other recognized international quality system standard by an accredited registrar is required. A copy of the supplier's third party registration must be provided to the organization.

7.2.2. In the event a supplier's quality system registration status changes or is suspended, the supplier shall notify the organization within five (5) business days. The supplier may be audited by the organization and/or be required to provide documentation explaining the status change, including a plan for corrective action.

7.3. New Level 3 Suppliers:

7.3.1. Completed Supplier Approval Worksheet, Supplier Quality System Survey, and approval by the Integrated Supplier Team.

7.4. Regardless of a supplier's classification level, the IST may require a Supplier QMS Audit be conducted and/or that the supplier attain third-party registration prior to approval of their quality system.

7.5. Results of onsite evaluation (if required) and approval status will be formally documented and communicated via the Supplier Approval Worksheet (PU-7.4-F005). Depending on the results:

7.5.1. The supplier's quality system may be deemed as "Fully Approved".

7.5.2. The supplier's quality system may be deemed as "Conditionally Approved", with full approval pending completion of a probationary period in which delivery and quality performance are monitored, and/or a formal corrective action plan is completed and approved.

7.5.3. The supplier's system may be deemed as "Needs Improvement", whereas supplemental actions are required by the supplier to address any identified deficiencies or areas of concern before full approval is awarded.

7.5.4. The supplier's system may be "Rejected" and the supplier will not be considered as a potential supplier without repeating the Supplier Quality System Approval process.

7.6. Supplier Quality System approval (i.e. a status of "Fully Approved" or "Conditionally Approved") is required before proceeding with SECTION 3: PPAP of this manual, and no contract or receipt of material or services is otherwise allowed unless approved via QA-13-F003, Request for Deviation/Waiver.

7.7. Supplier Quality System approval is valid only for the products/parts originally categorized at approved classification level or below (e.g. if a Level 3 supplier wants to supply Level 1 parts/products, the supplier must be approved for Level 1 (see 7.1 above) prior to initiating the PPAP process per SECTION 3).

8 Maintaining Approval Status

8.1 Once approved, supplier performance will be monitored and evaluated on an ongoing basis. Continued supplier approval status shall be based upon complying with the quality system requirements outlined throughout this manual, including a sustained level of "Acceptable" performance or above. Supplier performance will be formally evaluated and rated via Supplier Performance System (QA-8.3-W004).

8.2 Suppliers are formally notified of their performance and status via the distribution of delivered quality data and/or rating scorecards. Depending on the results of the periodic performance review, suppliers may be subject to one or more of the following:

8.2.1 Formal corrective action to address deficiencies in performance.

8.2.2 Onsite re-assessment of their quality system.

8.2.3 Change of their approval status (see 9 below).

8.3 Depending on the results of on-site assessments and/or periodic supplier performance ratings, a supplier may be required to obtain third-party registration to a recognized quality system standard in order to maintain "Fully Approved" status as a supplier.

8.4 The organization reserves the right to perform periodic on-site appraisals of the supplier's facility, quality systems, records, and finished goods.

8.5 Suppliers are required to complete the Supplier Quality System Survey (QA-8.2-F084) every three calendar years or earlier if requested. (Not applicable for suppliers who have submitted up-to-date AS9100 or ISO9001 Certifications)

9 Change of Approval Status

9.1 Suppliers may lose approval status due to any of the following:

9.1.1 Significant changes have occurred in the supplier's organization, location of manufacture, manufacturing process, or product that have not been formally documented and communicated for review and approval.

9.1.2 Significant decline in supplier performance and/or failure to maintain an "Acceptable" supplier performance rating.

9.1.3 Failure to respond with acceptable corrective action within the timeline established, or failure to implement stated corrective action as planned to correct a known deficiency.

9.2 The Integrated Supplier Team is responsible for any decisions regarding a change in a supplier's approval status. If a supplier's status is changed from "Fully Approved", they may be reclassified as "Conditionally Approved", "Needs Improvement", or "Rejected".

9.2.1 If reclassified as "Conditionally Approved" or "Needs Improvement", the supplier must meet the following requirements in order to regain "Fully Approved" status:

9.2.1.1 A supplemental review and approval by the Integrated Supplier Team of actions taken to address specific deficiencies.

9.2.1.2 A follow-up on-site quality system assessment, if required by the Integrated Supplier Team.

9.2.1.3 A minimum of an "Acceptable" rating for the next rating period.

9.2.2 If reclassified as "Needs Improvement", the supplier shall be temporarily removed from the Approved Vendor List and no additional products or services may be purchased from that supplier until they regain at least a "Conditionally Approved" status.

9.2.3 If reclassified as "Rejected", the supplier shall be removed from the Approved Vendor List and no products or services may be purchased from that supplier. The supplier must repeat the Supplier Quality System Approval process to be considered for future business.

SECTION 3: PRODUCTION PART APPROVAL PROCESS

1. **Introduction**

1.1 Once the supplier's quality system has been approved, parts or components being sourced must be approved for production using the Production Part Approval Process (PPAP). This is the documented verification that all of the organization's engineering design requirements are met by the approved supplier. It is the supplier's responsibility to meet all applicable PPAP requirements and specifications. Suppliers are not authorized to begin shipment of production quantity material prior to part/process approval.

1.2 The PPAP process and requirements (as defined below) may vary depending on the supplier and the individual component or material being qualified and approved. Those PPAP requirements applicable to a given situation will be formally defined and communicated to the supplier by Procurement via the PPAP Initiation/Requirements Form (QA-7.4-F005).

2. **Purpose**

The purpose of the PPAP process is to verify that the supplier fully understands all engineering design and specification requirements. In addition, the PPAP process will validate that the manufacturing process used by the supplier has the capability to produce product consistently meeting those requirements during an actual production run, at the quoted production rate.

3. **General Requirements**

3.1 For a new supplier, the PPAP process will be initiated by the organization after obtaining Supplier Quality System Approval per SECTION 2 of this manual.

3.2 For previously approved suppliers, the PPAP process will be initiated per Table 2 below.

4. **Production Part Approval Process (PPAP) Initiation**

PPAP initiation is required when any of the events shown in Table 2 – PPAP Initiation occurs:

Table 2 - Production Part Approval Process (PPAP) Initiation

Item	Area	PPAP Initiator	Events
1	New / Change of Supplier	Miltope	• Miltope approval of a new supplier providing parts, materials or services
		Supplier	• Adding or changing a sub-tier supplier • Changing from in-house production to sub-tier supplier • Change from sub-tier supplier to in-house production • Change of manufacturing location for the current supplier
2	Design Change	Miltope	• Newly designed part • Miltope design change (ECN) that potentially affects fit, form, function, durability, or performance of the part

Table 2 - Production Part Approval Process (PPAP) Initiation			
Item	**Area**	**PPAP Initiator**	**Events**
		Supplier	• Supplier design change that potentially affects fit, form, function, durability, or performance of the part
3	Material Change	Supplier	• Change in raw materials used by the supplier • Change in supplier's source of material
4	Process Change	Supplier	• Any process change, including inspection methods and machine programming, that potentially affects fit, form, function, durability, or performance of the part • Initial use of new die, machine or process • Repair, rework or replacement of tooling (not including routine maintenance that does not potentially affect fit, form, function, durability, or performance) • Product re-released after lapse in production for twelve months or more • After a natural or man-made event which may adversely affect the manufacturing process
5	Miltope's Request	Miltope	• At Miltope's discretion due to a supplier quality concern or other reasonable cause

5. PPAP Required Documentation

5.1 PPAP Initiation/Requirements Form (QA-7.4-F005) must be completed and submitted for all PPAP's.

5.2 Applicable PPAP forms will be provided to the supplier by Procurement as part of the initiation request.

5.3 Excluding the PPAP Initiation/Requirements Form and the Feasibility Statement (QA-7.4-F006), suppliers may use their own forms as long as all information required on the organization's documents is clearly included within the supplier's documents. Supporting documents may be submitted electronically.

6. PPAP Process Requirements

6.1 For production parts, PPAP samples shall be taken from a production run of consecutive parts. The run will typically be from one (1) to eight (8) hours of production, with the goal to replicate a normal day's production run. The production run quantity and sample size shall be agreed upon in advance by the organization and the supplier.

6.1.1 When tooling or machines are used that produce multiple parts simultaneously, such as a multi-cavity mold or CNC machining center with multiple stations, each unique element shall be treated as a separate process. Specific requirements should be agreed to by the organization and the supplier.

6.2 The PPAP production units shall be manufactured at the production site using the same tooling, gaging, processes, materials, and operators from the production environment that will be used to produce production quantities of the part.

6.3 PPAP submission documentation will include the PPAP Initiation/Requirements Form (QA-7.4-F005), as well as all documentation requested on the PPAP Initiation/Requirements Form by the organization. The PPAP Initiation/Requirements Form is used as a check-sheet by both the supplier and the organization in an effort to formally define the PPAP requirements.

6.4 If required, a Feasibility Statement (QA-7.4-F006) shall be submitted. The “Sign-Off” section must be signed by members of the supplier’s management with authority to reach the “Feasible” or “Not Feasible” conclusion. Any concessions or exceptions must be declared in the “Comments” section of the form.

6.5 If required by the PPAP Initiation/Requirements Form, the supplier shall perform and document a full inspection of all PPAP sample parts against the specifications and requirements of the applicable organization drawing. A copy of the drawing shall be marked to clearly identify the requirement being reported for each result, and shall be attached to QA-7.4-F007 (Inspection Report) or an equivalent supplier form.

6.6 If a First Article Inspection (FAI) is required, the method used to complete and document the FAI must comply with the requirements of AS9102. Only one sample part is required to be inspected for the FAI. The results must be reported using form QA-8.2-F001 (First Article Conformance Report) or other AS9102 compliant format.

6.7 Material and performance testing may be required and shall be performed and reported as follows:

6.7.1 The supplier shall perform material and performance tests as necessary to verify that the requirements of all drawings and technical specifications are met.

6.7.2 When a third party laboratory performs testing, a qualified facility shall be chosen to perform material and performance testing. Proof of facility qualification may be required to accompany the PPAP submittal.

6.7.3 The supplier must submit required material and performance test results on the laboratory letterhead, the laboratory’s normal report format, or form QA-7.4-F008 (Material/Performance Test Results).

6.8 Initial process capability studies may be required for key characteristics. The purpose of the initial process capability study is to estimate both short-term and long-term process capability (i.e. process variability versus specification). Minimum sample size of thirty-two (32) pieces is required unless otherwise agreed to by the organization as indicated on the PPAP Initiation/Requirements Form.

6.8.1 The process capability index (Cpk) shall be calculated and reported for each key characteristic along with the raw data.

6.8.2 Table 3 - Process Capability Criteria specifies the acceptance criteria for process capability results for key characteristics.

Table 3 –Process Capability Criteria	
Results for Cpk	Interpretation
Cpk $\geq$ 1.33	Process meets requirements
1.33 > Cpk $\geq$ 1.00	Process is acceptable but may need monitoring to ensure ongoing compliance
Cpk < 1.00	Process does not meet the acceptance criteria and may need improvement.

6.8.3 Should the process not meet the criteria above for acceptance, additional actions will be required and the PPAP cannot receive Full Approval status (see paragraph 7.2 below). The supplier's action plan must be approved by the organization and may require one or more of the following until acceptable process capability is established and verified:

6.8.3.1 100% inspection of applicable characteristics

6.8.3.2 Submission of supporting histograms and control charts with each shipment

6.8.3.3 Additional capability studies

6.8.3.4 Approved deviation by the organization using QA-13-F003, Request for Deviation/Waiver

6.9 The supplier may be required to perform and submit a Measurement System Analysis (MSA) study for key characteristics. MSA studies should adhere to approved methods similar to those published by the Automotive Industry Action Group (AIAG). In general, the results of the MSA should meet the following requirements, unless otherwise agreed to formally by the organization:

6.9.1 Gage resolution and accuracy must be less than or equal to 10% of the total tolerance.

6.9.2 Gage Repeatability and Reproducibility (GR&R) must be less than 30% of the total tolerance.

6.10 The supplier may be required to prepare a Process Flow Chart (a.k.a. Flow Diagram) that shows all process steps in sequence used to manufacture and inspect the product supplied. The Process Flow Chart should include the process steps for nonconforming product.

6.11 The supplier may be required to conduct a Design Failure Mode and Effects Analysis (DFMEA) and/or a Process Failure Mode and Effects Analysis (PFMEA). The FMEA shall be developed in accordance with commonly accepted methodologies, such as those published by AIAG. FMEA results may be submitted on form QA-7.4-F009 (Failure Modes and Effects Analysis) or the equivalent supplier form.

6.12 The supplier may be required to submit a process Control Plan that defines all controls used for process and product control. Each process step and inspection point in the process flow shall be shown on the Control Plan. The Control Plan shall be developed in accordance with

commonly accepted Control Plan methodologies, such as those presented in the Advanced Product Quality Planning and Control Plan (APQP) reference manual published by AIAG, and may be submitted on form QA-7.4-F010 (Control Plan) or the equivalent supplier form.

6.13 The supplier may be required to submit product reliability test data. Reliability test protocol and required data shall be defined by the organization in advance and results submitted per the agreed upon format.

6.14 At the time of quotation, suppliers will detail proposed packaging specifications with the size and weight limitations.

6.15 The PPAP package should include evidence of sub-tier supplier approval (by the supplier) for all out-sourced processes associated with the product. The organization may request additional supporting documentation.

6.16 All other specific requirements as defined per the PPAP Initiation/Requirements Form shall be submitted along with the PPAP documentation package.

6.17 The supplier shall provide sample products as requested by the organization and defined by the PPAP Initiation Request Form. Samples are to be taken from parts measured and identified accordingly. The supplier shall uniquely identify product samples sent to the organization.

6.18 The supplier shall retain a master sample until final PPAP approval.

6.19 If requested, the supplier shall include with the PPAP submission any part-specific assembly or component inspection aid. Inspection aids may include fixtures, gages, models, templates, etc.

7. PPAP Approval

7.1 Once completed, the PPAP documentation package shall be submitted to Procurement. Procurement will coordinate internal review of the package.

7.2 Formal approval will be sent to the supplier by Procurement. If any additional information is required to complete the approval, the supplier will be formally contacted by Procurement.

7.2.1 Full Approval: Indicates that the part or material meets all specifications and requirements. The supplier is therefore authorized to ship production quantities of the product subject to releases from the organization’s scheduling activity.

7.2.2 Interim Approval: Permits shipment of material for production requirements on a limited time or piece quantity basis. Interim approval will only be granted when a deviation is approved via QA-13-F003, Request for Deviation/Waiver, and the supplier has:

7.2.2.1 Clearly defined the root cause of the nonconformities preventing full approval, and

7.2.2.2 Prepared an interim approval action plan agreed upon by the organization. Re-submission to obtain “Full Approval” may be required.

7.2.3 Rejected: Means that the submission does not meet requirements. Corrected product and/or documentation, as applicable, shall be submitted, and approved before production quantities may be shipped.

7.3 If the PPAP is rejected, the supplier will be informed of the reason for the rejection and the supplier must provide the corrective actions to resolve the causes of the rejection.

8. Guidelines for Initial Production after PPAP Approval

8.1 All changes to supplied production materials must be properly documented and approved in writing by the organization prior to implementation. All product and process changes having the potential of affecting form, fit, or function require a formal supplier PPAP change request via PPAP Initiation/Requirements Form (QA-7.4-F005) to be submitted to the organization for review and approval. If uncertain whether a request for change is required, the supplier shall contact Procurement.

8.2 Procurement should be notified (via fax or e-mail) prior to the initial shipment of the initial production parts following PPAP approval. It is absolutely critical that the supplier, working in conjunction with Procurement, positively identify the implementation and shipment dates for all product changes.

SECTION 4: GLOSSARY / APPENDIX

Terms & Definitions

ADVANCED PRODUCT QUALITY PLANNING (APQP): A framework of procedures and techniques used to develop products in industry, particularly the automotive industry.

AUTOMOTIVE INDUSTRY ACTION GROUP (AIAG): A not-for-profit association of companies involved in the automotive industry.

BUSINESS RISK: The degree of risk used to determine the supplier classification level based on overall volume of the component/product being supplied to the organization.

CONTROL PLAN: A document describing the systems for controlling parts and processes. A Control Plan is a living document and should be updated to reflect the additions and deletions of controls based on experience gained by producing parts. The Control Plan should also reinforce and concur with the Process FMEA, Process Flow Diagram, Quality Plan, Procedures and Work Instructions.

CORRECTIVE ACTION REQUEST (CAR): A request to investigate a problem that already happened and requires root cause analysis and resolution to prevent recurrence.

CRITICAL-TO-QUALITY (CTQ) CHARACTERISTIC: A characteristic that is critical to part form, fit or function, or in some cases, part manufacturability or assembly.

ENGINEERING CHANGE NOTICE (ECN): A document which records or authorizes a change to a specific design.

FAILURE MODE AND EFFECTS ANALYSIS (FMEA): An analytical technique used as a means to ensure that, to the extent practical, potential failure modes and their associated causes/mechanisms have been considered and addressed. This systematic approach parallels, formalizes and documents the mental disciplines used to ensure the safety and performance of a product. Design FMEA's are used by design engineers to document the completeness and effectiveness of their design controls. Process FMEA's look at the manufacturing process and process controls.

GAGE REPEATABILITY AND REPRODUCIBILITY (GR&R): A study which measures the amount of variability induced in measurements by the measurement system itself, and compares it to the total variability observed to determine the viability of the measurement system.

INTEGRATED SUPPLIER TEAM (IST): A cross-functional team consisting of representatives from the organization's Procurement, Quality and Design Engineering.

MEASUREMENT SYSTEM ANALYSIS (MSA): An evaluation of a measurement system for the purpose of determining its suitability for inspection of a particular feature or requirement. At a minimum, the MSA will generally determine the percentage of allowable tolerance occupied by measurement variation (Gage R&R). More detailed MSA's may evaluate the measurement system with respect to bias (accuracy), stability, and linearity.

NONCONFORMANCE REPORT (NCR): A report which logs and tracks the occurrence of a nonconformance, either on paper or electronically.

NON-DISCLOSURE AGREEMENT (NDA): A legal contract between at least two parties that outlines confidential material, knowledge, or information that the parties wish to share with one another for certain purposes, but wish to restrict access to or by third parties.

PROCESS CAPABILITY INDEX (Cpk): A statistical assessment of the ability of a process to produce within specification.

PROCESS FLOW CHART: A graphic technique using symbols to identify the operations in a process, including their inter-relationships, inputs, and outputs.

PRODUCTION PART APPROVAL PROCESS (PPAP): Defines requirements for production part approval. The purpose is to determine if the supplier properly understands all engineering design specifications and if the process has the potential to produce product consistently meeting these requirements during an actual production run at the quoted production rate.

QUALITY PLAN: A document that defines the specific quality practices, resources and activities relevant to a particular product, project or contract.

RELIABILITY DATA: Test data used to confirm product performance against engineering and industry specifications over a given period of time.

SUB-TIER SUPPLIERS: Companies that supply directly to the organization's authorized suppliers.

SUPPLIER CLASSIFICATION LEVEL: The classification index (Level 1, 2 or 3) assigned to suppliers based on an assessment of the technical and business risks.

SUPPLIER CORRECTIVE ACTION REQUEST (SCAR): A formal request to a supplier to correct a problem and explain exactly how it will do so.

SUPPLIER NONCONFORMANCE REPORT (SCNR): A report notifying a supplier of the occurrence of a nonconformance in a product or service they provided.

TECHNICAL RISK: The degree of risk used to determine the supplier classification level based on the technical complexity of the component/product being supplied to the organization.

Revision Summary

Revision	Date	Change	Training Required?
A	4/24/2013	Initial Release	Yes ☐ No ☒
B	8/4/2014	Delete paragraph 8 (Supplier Receipt & Acceptance of QA Manual Content), update section 2, 3, and 4	Yes ☐ No ☒
C	4/10/2018	Updated some paragraphs to reflect revised structure and intent of this manual.	Yes ☐ No ☒
D	11/09/2018	Removed QA-8.2-F041	Yes ☐ No ☒
E	6/10/2019	Added AS9100 D clause 8.4.3,, Product safety and ethical behavior to section1 number5 “responsibilities” and human factors requirements to section 1 number 7.5	Yes ☐ No ☒
F	8/11/2020	Updated to reflect name change; removed VT Miltope and changed to “the organization” per statement added to section 3.	Yes ☐ No ☒