AMETEK
AEROSPACE & DEFENSE

50 Fordham Road
Wilmington, MA 01887-2190 U.S.A.

SUPPLIER QUALITY REQUIREMENTS MANUAL

QOP # 8.003.583 **REVISION: F N**

Originator: Carlos Martinez
Date Drafted: 14 April 2023
Approved by: Bob Wheaton
Approval Date: 14 April 2023

AMETEK Aerospace & Defense

Supplier Quality Requirements

1.0 PURPOSE

This document defines and communicates the expectations and requirements of AMETEK Aerospace & Defense for its suppliers. The supplier's compliance and understanding of these conditions is an essential step toward fulfilling AMETEK's 100% quality commitment to its customers.

2.0 APPLICABILITY

The requirements of this document apply as mandatory condition of acceptance of all AMETEK Aerospace & Defense purchase orders (P.O.'s).

3.0 AMETEK'S MISSION

To provide high-value instruments, accessories, sensors and fluid management systems to aircraft/engine and land based gas turbine OEM's and using activities via proven and advanced technologies.

4.0 AMETEK's SUPPLIER QUALITY OBJECTIVES

- Achieve 100% conformance with all P.O.'s and referenced requirements.
- Promote long-term partnerships with a select group of qualified suppliers, using total costs of quality as a measurement of performance.
- Ensure that purchased material quality and reliability levels are maintained and improved proactively.
- Minimize and ultimately eliminate the need for AMETEK Incoming Inspection through supplier control and certification.

5.0 AMETEK SUPPLIER MANAGEMENT PHILOSOPHY

AMETEK's Procurement directives are focused on selecting and developing suppliers who are committed to the following key concepts:

- Operational Excellence (OPEX): An AMETEK, Inc. Corporate philosophy dedicated to making quality everyone's job, in an environment where everyone is both a supplier and a customer. Quality must be designed and built into every step of the manufacturing process, not inspected in.
- Quality systems must be dedicated to defect prevention (e.g. use of six sigma quality or other statistical process controls), not defect detection. Problem solving must be based on root cause analysis and corrective action. Adding more inspection only increases overall customer costs.
- The responsibility for purchased product quality lies with both AMETEK and its suppliers.

6.0 SUPPLIER RESPONSIBILITIES

6.1 Organization

The supplier must have a documented management function with well defined responsibility, authority and freedom to perform quality functions: identify, evaluate and solve quality problems.

6.2 Quality System

The Supplier must have a documented quality system to ensure consistent, traceable compliance with AMETEK's requirements. Suppliers must, at a minimum, meet the ISO 9000 series quality system requirements (or MIL- I-45208, if applicable). When required by purchase order, suppliers must also meet AMETEK's customer flowdown requirements, e.g. AS9100.

The supplier must ensure their personnel are aware of:

- Their contribution to product or service conformity.
- Their contribution to product safety.
- The importance of ethical behavior.

6.3 Control of Documents

The supplier must review all requirements specified on AMETEK P.O.s, engineering drawings and referenced specifications at the earliest practical phase to ensure that compliance is achieved.

The supplier must have a system that assures product being manufactured meets the configuration required in AMETEK purchase orders. The supplier must consult AMETEK to ensure availability of the required revision level for raw materials and/or specification documents, i.e. standing instructions (SI's), as well as applicable customer specifications that are referenced on AMETEK engineering drawings. Obsolete documentation must be purged. Supplier's internal inspection and manufacturing control plans must reflect the revision level of the current purchase order.

In the event of conflict between drawing and/or P.O. requirements, the supplier must contact their AMETEK Buyer to secure proper interpretation and appropriate documented authorization to proceed.

When the term Source Substantiation List ("SSL") or Vendor Substantiation List ("VSL") appears in a note on an AMETEK drawing, the designated source or process described in the referenced AMETEK SI may not be changed without written approval from AMETEK.

AMETEK classifies drawing characteristics using the symbols:

⊕ Critical
⊖ Major

Suppliers are required to have data on file showing 100% inspection of critical characteristics and .65% AQL, Level II, per ANSI/Z1.4 (MIL-STD-105E) for all major characteristics. A statistical plan showing control of parameters and processes (SPC with a Cpk > 1.33), when approved by AMETEK SQA, may be used in lieu of the AQL's noted.

6.4 Calibration

Suppliers must have a system to insure measuring and test equipment is calibrated at intervals appropriate for the device, its use and stability. This system must comply with ANSI/Z540-1 (MIL-STD-45662A).

6.5 Statistical Process Control

SPC is a means of assuring that a process is stable and capable of consistently meeting quality and delivery requirements at the lowest possible cost.

Suppliers are encouraged to use SPC or other statistical tools (e.g. six sigma quality), where applicable, useful or when required by AMETEK.

6.6 Tooling Approvals

Suppliers are required to perform first article inspections on all parts produced using AMETEK purchased or AMETEK supplied tooling. The purpose is to determine, prior to starting production, the part meets all drawing requirements and that correlation between AMETEK and the supplier's inspection is achievable.

To recover tooling costs, when authorized by Purchase Order, a minimum of one (1) sample must be submitted with a first article inspection report. Verification of conformance may be conducted at AMETEK. Suppliers will be notified in writing of sample inspection disposition.

All samples and inspection reports must be representative of that produced from production tooling which can be duplicated on future shipments. First article reports must be resubmitted per the requirements of Q.C. Code letter "F" on the applicable purchase order on a maintenance basis.

6.7 Subtier Supplier Control

Suppliers are responsible for control of subcontracted products and processes that are used on AMETEK products. Particular care must be exercised on raw materials and Special Processes (see paragraph 6.8). Suppliers must have documented evidence that their subtier sources are capable of performing or providing the product or service specified. Suppliers must "flow down" the required AMETEK, industry or other specifications (and revisions thereto) needed to fulfill AMETEK's drawing requirements.

6.8 Special Processes

Definition: *A manufacturing process that causes material to undergo chemical, physical or metallurgical transformation for which normal inspection is not sufficient to evaluate quality. This may include plating, heat treating & nondestructive evaluations (x-ray, magnetic and fluorescent penetrant inspections, etc.).*

AMETEK maintains a listing of special process and material suppliers approved for direct contracting. Referrals for sources may be secured by contacting AMETEK's Buyer or Supplier Quality Engineering (SQE). Suppliers are responsible for all special processes performed in-house and sub-contracted. The "Supplementary Procurement Terms and Conditions" portion of the Purchase Order reinforces this policy.

6.9 Records

Suppliers are expected to maintain accessible files, traceable to AMETEK's P.O. and/or part numbers, which contain:

- Inspection and test reports for each shipment.
- Engineering drawings & specifications, at correct engineering change (revision) level.
- Process capability and process control data if used for substantiation.
- Any deviations authorized by AMETEK.
- Certification data for subtier contracted items and raw materials.

Records must be maintained for a minimum of 10 years after shipment date. Record disposition requirements is to destroy records in such a manner they are unusable.

6.10 Notification of Anomalies/Changes

As required by Contracts, Purchase Orders or applicable specifications, suppliers are responsible for notifying AMETEK Purchasing and/or SQE for changes to processes, products, or services, including changes of their external providers or location of manufacture and obtain AMETEK's approval.

In addition, Suppliers are responsible for notifying AMETEK of any anomalies or changes that may affect product quality, performance, reliability, delivery and workmanship, as well as requesting approval of process changes (when required). These requirements apply to both work in process and to any shipment previously made to AMETEK for which a determination has been made that nonconforming material may have been shipped. AMETEK anticipates that this notification will be made within one (1) business day.

No revisions to design, materials or specifications are permitted without prior documented approval from AMETEK.

6.11 Material Identification

All parts must be marked per the methods, nomenclature and specifications referenced on AMETEK's engineering drawings. Where required, location of marking will be specified.

6.12 Supplier Data Requirements

Data and certification requirements are transmitted primarily by the Quality Control ("QC") Code letters on the P.O. Supplementary data may also be required by line items on the body of the P.O. or per the drawing notes.

- Data is required with each shipment. The minimum requirement is a Certificate of Conformance (CofC) to AMETEK's engineering drawing and revision level.
- Data must be enclosed with the material, in the #1 container.
- Failure to submit required data will result in a lot rejection that will affect a supplier's performance rating.

In the event a new customer directive is received by AMETEK that applies to a specific AMETEK supplier or suppliers, e.g. a Rolls Royce SABRe change or Notice to Supplier (NTS), AMETEK's SQE function shall contact the affected supplier(s) and request formal action(s) be taken from the applicable supplier(s).

6.13 Source Inspection

When "Inspection at Source" is required, AMETEK expects suppliers to comply and provide reasonable notice to arrange for on-site inspection in time to support delivery requirements.

This requirement also applies to Government Source Inspection ("GSI") as required by QC Code "G". Refer to Supplementary Procurement Terms and Conditions for complete requirements and definitions.

6.14 Packaging and Preservation

If packaging instructions are not specified, the supplier must insure that good commercial packaging techniques are followed. Improper packaging or lack of identification will be cause for rejection at AMETEK's Receiving.

- Material subject to corrosion must be properly protected by rust preventive measures.
- Parts subject to Electro-Static Discharge ("ESD") damage must be handled, packaged and marked per MIL-STD-1686B or equivalent industry standard.

6.15 Supplier Liability

AMETEK operates on the premise that the supplier has effectively screened and removed all defective parts from each shipment. A single defect found in the lot will be cause for rejection and may, at AMETEK's discretion, result in the return of the entire quantity without further inspection.

A shipment accepted by AMETEK may prove to be defective at a later point in the manufacturing cycle. The supplier is liable for parts supplied to AMETEK throughout AMETEK's storage, manufacturing and customer's use, except for deterioration due to improper handling or expired shelf life.

6.16 Supplier Corrective Action Requirements

If the supplier is issued a Supplier Corrective Action Request, the supplier shall complete the 8 Discipline report (8-D). This includes: Containment, Root Cause, Interim Corrective action, Long term Corrective Action, Implementation and effectivity.
The Corrective Action Response shall be structured using the following steps as a guide to achieve effective product and systems integrity.
Containment - Assure that all suspect products have been adequately segregated and the process has been immediately corrected as appropriate. Containment actions shall be provided to AMETEK within 24 hours.
Root Cause Analysis - Determine the underlying reason for the variance or noncompliance. Both process root cause (causing the product variance) and Quality System root cause (reason the variance was not detected and escaped the supplier's facility) should be analyzed.
Interim/Long Term Corrective Action - Detail the steps necessary to successfully generate corrective action that will permanently correct the situation.
Examples of acceptable corrective action:
Improve tooling, fixture and gagging.
Modify and better define manufacturing process(es).
Revise manufacturing operation sheet to clarify and better define work instructions.
Conduct formal and informal on-the-job training.
Revise measurement system or sampling plan.
Implementation - Implement the steps detailed under "Interim/Long Term Corrective Action/Plan." Include implementation date for each step.
Effectivity – record date when corrective action is effective. Other information such as Lot/Batch No., Serial Number or other applicable information should also be recorded as needed.

The Supplier Corrective Action Request 8D must be signed by an authorized representative of the company and be returned to AMETEK by the assigned due date. Note: Corrective Action Responses are due in 30 days. If the supplier requires more time to identify and implement corrective action, the supplier must contact your AMETEK Supplier Quality Engineering representative; 24 hours prior to the due date, and request an extension.
Failure to reply to a supplier corrective action request may affect the suppliers' approval status, rating, and/or future procurement opportunities

7.0 INSPECTION AT AMETEK

AMETEK employs a variety of inspection and sampling methods for purchased materials. These include: 100% screening, sampling inspection and periodic skip lot inspection.

Inspection methods are primarily based on ANSI/Z1.4 (MIL-STD-105E). Historical performance, product complexity and criticality of product end use are also taken into account.

AMETEK's primary disposition is to return all rejected lots to a supplier. The decision to sort, rework or otherwise use any nonconforming material is AMETEK's sole prerogative. Any alternate dispositions will be counted as rejected lots in a supplier's performance rating.

8.0 NONCONFORMANCE REQUESTS

AMETEK expects its suppliers to manufacture conforming parts. If a deviation from an AMETEK P.O. requirement becomes necessary, a request must be made through the AMETEK's Purchasing or SQE.

- No requests will be considered without adequate cause and corrective action.

- Shipments to AMETEK are not permitted without prior written approval of requests.

- AMETEK will make reasonable efforts to grant deviations, but is under no obligation to do so.

9.0 SUPPLIER PERFORMANCE

9.1 PERFORMANCE MEASUREMENT

AMETEK conducts a comprehensive evaluation of the supplier's performance from both a quality and delivery viewpoint. As these criteria are extremely important to AMETEK, long term strategic decisions, such as partnerships, long term agreements ("LTA's") and phase-outs, will be based upon a supplier's ability to satisfy AMETEK's procurement needs. Supplier reviews will be performed using the following criteria:

Incoming Lot Acceptance Rate*

On-time delivery performance*

Price

Responsiveness to corrective action requests

Commitment toward continuously improving performance in this criteria on a on-going basis is expected from all active AMETEK suppliers.

* These metrics are entered into AMETEK's OPEX website on a monthly basis for further review by AMETEK's Division staff.

9.2 PERFORMANCE REPORTING

In the event that an AMETEK supplier is not meeting AMETEK expectations from either a quality or delivery perspective, the supplier will be requested to provide cause and corrective action. Failure to adequately respond to such an AMETEK request may lead to supplier disapproval.

9.3 SUPPLIER EVALUATIONS

A quality survey will be performed at a supplier's facility or via email by AMETEK's SQE and/or Purchasing personnel. Typically, this is done for prospective suppliers prior to P.O. award. Re-evaluation process will be at least every 3 years through quality survey or on site.

The purpose of an AMETEK survey is to evaluate a supplier's manufacturing processes and quality system capabilities. Suppliers will be notified by letter with the results of evaluations under four categories:

- Approved - supplier's quality system and/or performance meets expectations with no restrictions.

- Conditional - deficiencies in a supplier's system and/or performance were observed which require improvement. Corrective action response is required within 30 days.

- Limited - deficiencies in a supplier's system and/or performance were observed which require immediate resolution. Corrective action is required within 30 days.

  Limited status is also for suppliers that AMETEK has deemed to be marginally compliant. As a result, AMETEK has/will impose specific procurement limitations.

- Disapproved - supplier facilities, or quality systems, or attitude is judged inadequate. All new business activity is stopped; no P.O. can be placed.

On-site audits are not mandatory as they are dependent on AMETEK's discretion based on upon the type and criticalness of the material or service provided by the supplier, as well as the complexity and volume of purchases made with that supplier. In lieu of an on site survey, a supplier can be approved via a mail in survey.

Representatives from AMETEK's customer, the Department of Defense or other government agency, as well as specific regulatory agencies (i.e., the Federal Aviation Administration) reserve the right to audit an AMETEK supplier's quality system, manufacturing processes and test procedures.

9.4 SUPPLIER CERTIFICATION

AMETEK's Dock to Stock program is intended to simplify AMETEK's receiving process for supplier parts. This program is in line with AMETEK's OPEX principle of rewarding suppliers that have delivered high quality parts on a continuous basis. This program also allows for a more cost effective processing of purchased materials.

Suppliers who have exceptional quality ratings and are committed to process controls and preventative techniques that improve quality and help reduce AMETEK's costs will be targeted as candidates. A participant in this program will be a preferred source for new and ongoing business.

The supplier can contact their respective AMETEK Buyer or SQE for additional information.

10.0 SUPPLIER CONTACTS

Suppliers should feel free to contact or visit AMETEK at any time to discuss and resolve problems that may arise. All visits must be coordinated with AMETEK's Purchasing Department. Technical discussions may be arranged with AMETEK's SQE.

11.0 QUALITY REQUIREMENTS

In addition to conforming to drawing requirements, suppliers must adhere to additional quality requirements. These requirements are typically flowed by way of the purchase order (PO) in the form of codes to identify specific quality requirements pertaining to the material being supplied. Form QA-S-002 provides the details of each code that applies. This form is available on the AMETEK Supplier Portal to provide the necessary detail involved with the requirement.

The supplier must include all necessary information pertaining to the particular quality requirement that is flowed down as evidence of compliance. This includes but not restricted to certificates of compliance, necessary test data, analysis data, material analysis etc. as applicable. If the required supporting evidence/documentation is not provided or is not in compliance, material will be rejected and will not be officially received and may be returned until the required documentation is provided.

The following quality requirements/codes apply to every purchase order. These requirements may or may not be specifically identified on the PO but are still applicable and the supplier is required to comply. These codes are identified on Form QA-S-002 by way of an asterisk (*).

- Certificate of Conformance (A)
- Shelf Life / Age Control (B)
- First Article (F)
- Right of Access (H)
- FOD Program (M)
- Record Retention (Q21)
- Quality Management System (S)
- Counterfeit Part Program (D2)

12.0 REVISION RECORD SHEET

ISS	REV	DATE	CHANGED BY	DESCRIPTION
5	New	01/31/89	K. Arnold	Combined QOP 8.014.583 & QOP 8.011.583 with QOP 8.003.583.
5	A	05/15/89	K. Arnold	Changed paragraphs 6.6.5.7, 6.6.5.8, 6.6.5.10, 6.6.7.2, 11.8.1, 6.7, 16.1 and Exhibit G.
5	B	06/22/89	K. Arnold	Change paragraph 10.6
6	New	01/31/92	A. Kirkwood	Total rewrite and format change. Delegated reference documents; simplified marking, non-conformance requests, quality systems and quality planning requirements, special process listing, sampling inspection levels, non-required exhibits and definitions.
6	A	03/04/93	A. Kirkwood	In section 6.3, revised to require MIL-I-45208 quality system for all suppliers Required suppliers consult AMETEK's quarterly revision matrix to determine raw material and referenced specification revisions.
6	B	03/04/94	A. Kirkwood	No changes to content, new format.
6	C	03/06/95	A. Kirkwood	Added on time delivery to need to supplier's evaluation criteria in section 9.1. Deleted data envelope reference.
6	D	10/12/95	A. Kirkwood	In section 6.3, revised AMETEK's specification revision listing criteria. In section 6.9, added requirement that suppliers flow-down specification revisions on subcontracted work. IN section 9.3, added new supplier evaluation results criteria, i.e., limited approval.
6	E	05/09/97	A. Kirkwood	In section 3.0, revised mission statement. In section 6.2, added D1-9000A flowdown requirement (when specified by AMETEK's P.O.). In section 6.3, extended distribution frequency of specification listing.

12.0 REVISION RECORD SHEET (Continued)

ISS	REV	DATE	CHANGED BY	DESCRIPTION
6	F	07/16/02	J. Sheffield	Updated section 6.10 to include the requirement for suppliers to report anomalies to meet AS9100 requirements. Changed AAPI to AMETEK in all sections. Added reference to six sigma quality, ISO 9000 series documents, AS9100, ANSI/Z1.4, and ANSI/Z540-1. Eliminated reference to Exhibits A & B. Clarified supplier rating criteria and changed total quality to operational excellence (OPEX).
6	G	14Aug09	M. Needham	Changed AMETEK Division name to Aerospace & Defense. Updated section 6.10 to identify an anticipated 1 day notification for supplier anomalies. Updated section 6.12 to identify a mechanism to flowdown a new customer requirement to applicable suppliers. Updated section 9.1 to reflect current supplier performance measurement criteria.
6	H	14Nov16	M. Needham	Revised section 6.9 changed record retention from 7 to 11 years. Added section 6.16 Supplier Corrective Action Requirements.
6	I	25Jun18	O.Martinez	Revised section 6.2 changed according to AS9100 Rev. D requirements
6	J	07Nov19	O.Martinez	Revised Section 6.10
	FM	25Aug22	G.Rodriguez	Updated revision format. Revised section 9.3 changed according to AS9100 Rev. D requirements
	FN	14 Apr 23	B. Wheaton	Added section 11 for quality requirements flowdown.