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1. QUALITY SYSTEM OVERVIEW

TA Quality Management System focuses on Advanced Product Quality Planning (APQP), continuous improvement and defect prevention. TA is an advocate of the strategies, tactics and tools required to achieve Six Sigma product quality and delivery performance. All TA suppliers are expected to employ effective quality planning techniques and error proof their manufacturing processes so that zero defect objectives can be achieved. TA expectations of its suppliers are to establish continuous improvement projects to ensure annual improvements are made in the aspects of cost, quality, lead-time and delivery.

To achieve a Lean / Six Sigma supply chain, all aspects of the product need to be considered and optimized, from product design to TA manufacturing processes, supplier processes, transportation, warehousing and communication. Understanding process capabilities is the key to design for manufacturability and operational excellence - the ability to deliver high quality products at the lowest total cost. As TA continues to improve the overall business, change will become commonplace for our supply chain. These changes will include among other things; product redesigns, process improvements, and the need for higher quality purchased products and components. TA quality can only be as good as the quality of our purchased products and services. TA needs suppliers who are experts in their manufacturing specialty and who are also willing to teach and learn new process improvement methods to support mutual long term business growth.

Suppliers are selected and rated after review and evaluation of their quality system. TA reserves the right to audit the supplier's quality system if deemed necessary. Audits conducted by a third party can potentially be accepted in lieu of an on-site audit. Following an acceptable assessment of the supplier's quality system, the supplier is added to TA Approved Supplier List (ASL).

Supplier development is accomplished by monitoring supplier quality escapes and OTD performance as described in section 3.4 of this Supplier manual.

Suppliers failing to meet the quality system requirements defined in this manual may be subject to probation or removal from the TA ASL.

2. QUALITY SYSTEM REQUIREMENTS FOR SUPPLIERS

2.1 SCOPE

This document is applicable to all suppliers of product and/or services for TA (TA Aerospace Co.).

2.1.2 The content of this document defines the basic quality system required for suppliers of products and/or services to TA and is intended to orient suppliers in these requirements.

Acceptance of TA Purchase Order constitutes acceptance of the requirements in this manual. Any deviation from the requirements of this Supplier Quality Manual requires prior written agreement from the TA Quality and or Purchasing Department.

2.1.3 Should conflicts exist between a TA Drawing, Purchase Order, and this Supplier Quality Manual; TA Purchase Order will be the primary source of quality requirements, followed by Engineering Drawings then this Supplier Quality Manual.

2.1.4 The requirements of this manual will be satisfied in addition to the detailed requirements specified by Engineering Drawings, and any "special" quality requirements specified by our Purchase Order.

2.1.5 The supplier's quality system will be subject to review and evaluation by TA. When instances occur that warrant an on-site review of the supplier's process or control system, the supplier is expected to coordinate and fully cooperate in such reviews.

2.2 SUPPLIER RESPONSIBILITIES

2.3.1 Suppliers are responsible to establish and maintain a quality management system that ensures products and/or services will comply with all requirements specified by TA Drawing, Purchase Order and this Supplier Quality Manual. Suppliers shall have a system in place that addresses all applicable elements outlined in Section 4.0 of this manual. Full supplier compliance is required to remain or to be added to the TA ASL.

2.3.2 Suppliers are responsible to comprehend all drawing and specification requirements. If any questionable areas are identified, the supplier must contact the TA Purchasing Department for clarification. Clarification of any requirements not stated on the part drawings or other engineering specifications are to be resolved prior to any manufacturing and or service of production parts. In no case can Engineering Drawings and/or specifications be superseded by any informal verbal agreement. All agreements must be in writing from TA via an amended Purchase Order

2.3.3 When the design of the product to be supplied is controlled by the supplier, sufficient technical documentation will be maintained by the supplier or provided to TA to verify and validate the integrity of the product it receives.

2.3.4 Suppliers are fully responsible for their products / services and will not rely on TA to determine the quality level upon receipt. Use of sampling techniques or methods is not intended to imply that defective material at any level is acceptable nor does it relieve the supplier of their responsibility and or potential supplier chargeback. Defective product and or service to TA will potentially require corrective action to be initiated with investigation of the product / service root cause and control system adequacy. Correction must be implemented accordingly. All corrective actions are due three weeks from the issue date. Depending on the process (failure/escape) an extension may or may not be given. Again, any costs incurred by TA due to a supplier's issue could potentially result in a supplier chargeback (see 3.5 Cost Recovery).

2.3.5 TA may potentially accept a deviation provided the request is made in writing from the supplier prior to shipping to TA. Should the supplier decide to request a deviation for review and approval, they must initiate a written notice to the appropriate TA buyer. Upon submission to TA, the request will be sent to both Quality and Engineering for review and next steps.

2.2.6 Quality performance information showing the results of quality related activities must be kept on file at the supplier facility and made available upon request. Examples include inspection and test data, control charts, machine maintenance charts, etc. Suppliers will be responsible to collect, record and analyze data on an ongoing basis to ensure compliance. Retention of documents must comply with TA Terms and Conditions

2.2.7 Supplier is responsible to immediately notify TA during any situation and or circumstance where a supplier loses certification (i.e. NADCAP, AS9100, etc.).

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3 SUPPLIER QULIFICATION PROCESS

TA will send any new potential suppliers a Supplier Questionnaire. This questionnaire will be reviewed by the Quality Manager / Engineer and the determination will be made whether to add supplier to the Approved Supplier List. Criteria for evaluation and selection of suppliers for placement on TA's Approved Supplier List is based on the suppliers' abilities to consistently deliver defect free products and/or services, meet our delivery requirements, be cost competitive and be responsive to TA's needs.

Suppliers to TA will be evaluated on an annual basis. Supplier performance shall be measured by the Purchasing Manager on their ability to uphold the delivery dates defined in the order confirmation from TA and it will also be measured by Supplier Quality Engineer for the supplier's ability to meet or exceed the specs and tolerances per parts print. Final decision to remove supplier from ASL after annual is Quality Manager's responsibility.

Suppliers who intend to maintain a continuing business relationship with TA must demonstrate that they have or intend to implement a system that meets or exceeds TA supplier quality requirements.
Suppliers who currently do not meet this criterion are expected to be working toward the system defined in this manual within a one-year time frame unless another time frame has been documented and approved in writing by TA.

Supplier status will be classified on the ASL as either:

Approved: Suppliers that meet the minimum requirements of this document and have passed the appropriate TA Quality System Assessment.

- Supplier Questionnaire → Initial Assessment of Supplier
- TA Supplier Quality System Survey/Audit → Active Supplier Assessment
- Annual Supplier Survey → Used to maintain and mitigate risk with current Suppliers
- NADCAP Accredited (service suppliers only).

Conditionally Approved: Suppliers who have not been assessed to the requirements of this manual, or have been assessed and graded at a lower level but have committed to full compliance within a specified time period. This can also apply to suppliers who are not meeting the performance criteria as defined in section 3.4 of this manual.

Probationary: Initial suppliers must have 3 consecutive shipments accepted by Quality prior to transitioning from probationary to approved status. Future performance will follow the Supplier Performance Rating System in section 3.4 of this manual. Poor performing suppliers would be addressed with either an on-site visit by TA team or issuance of a corrective action. If minimum or no improvement is made by the supplier post alignment and next steps with TA, the supplier could potentially be removed from TA's ASL.

3.1 SUPPLIER QUALITY MANUAL

The supplier is no longer mandated to maintain a Quality Manual; however, they must ensure that all products conform to TA specified quality requirements. Each supplier is responsible for ensuring that a system is in place that confirms product quality and

provides for continuous improvement. These activities shall be demonstrated by the supplier and validated by TA during any on-site review.

3.2 ON-SITE QUALITY SYSTEM AUDIT

On-site audit will be determined base on external certification (ISO9000, AS9100 or NADCAP) and type of product/ service provided by supplier. An on-site quality system audit is recommended by TA once per every 2 years. The frequency of this on-site can be adjusted depending upon the overall performance history of the supplier. The audit will typically be led by a Purchasing / Quality representative and may be conducted using a cross-functional team consisting of Engineering and/or Sales. The audit will be conducted at the supplier's manufacturing location. The purpose is to validate continued compliance to TA supplier quality requirements along with TA customer specific flow down requirements. The audit will be performed with using the Supplier Quality System Survey/Audit forms, prior SCARs (if any), delivery issues (if any) as well as any customer specific verification requirements.

3.3 DISAPPROVAL

Any supplier failing to meet the quality system requirements or performance requirements defined by this Supplier manual may be subject to removal from TA ASL. In any event, a supplier is removed from the ASL, a full formal on-site review by TA Management (Quality and Purchasing) must be performed in order to be reinstated.

3.4 SUPPLIER PERFORMANCE RATING SYSTEM

TA has developed a supplier grading system for supplier performance based on two main metrics. This grading system is an objective method used to identify both highly performing suppliers and suppliers with a poor performance history. Our grading system takes into account both quality and delivery. We anticipate that our grading system will evolve, along with our suppliers. The details of the performance grading system are as outlined below:

Quality (Escapes- Discrepancy Reports)

TA measures supplier quality performance on an escape scale. The number of quality escapes within a given month (including the severity of the escape) determines the actions in which are required by TA to take in overall problem resolution.

Delivery (OTD)

On Time Delivery considers shipments which are either late or earlier than the contract allowed.

Late Shipments: A late shipment is defined as any shipment received on TA dock after its scheduled arrival date. The cutoff is at the end of the scheduled calendar day.

Early Shipments: An early shipment is defined as any shipment that is received by TA more than 3 days prior to its scheduled arrival date, unless approved by the Buyer.

Supplier Rating Criteria

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Quality	
Gold	0 Quality escapes (DRs)
Silver	2 or less Quality escapes (DRs)
Yellow	3 or less Quality escapes (DRs)
Red	4 or more Quality escapes (DRs)

On-Time Delivery	
Gold	100% - 90%
Silver	89% - 80%
Yellow	79% - 70%
Red	< 70%

Gold Supplier – High performing suppliers with 0 Quality escapes or less within the fiscal month and OTD of 90% or higher.

Silver Supplier – Suppliers with 2 Quality escapes or less within the fiscal month and OTD of 80% or higher.

Yellow Supplier – Suppliers with 3 Quality escapes or less within the fiscal month and OTD of 70% or higher.

Red Supplier – Suppliers with 4 Quality escapes or higher within the fiscal month and OTD less than 70%.

Approved Suppliers – For continued inclusion on the Approved Supplier List (ASL) a supplier must currently hold a yellow rating (at a minimum) with the ability to obtain silver within twelve (12) calendar months. Remaining in yellow status after twelve (12) months will default that supplier to a Conditional classification.

Conditional Suppliers – Suppliers regardless of status will automatically fall into this category after three (3) consecutive months of red status. Continued red status after an on-site review may lead to probation and or disapproval as a supplier to TA.

Both Quality and OTD ratings will define the supplier's rating. The lowest rating that a supplier falls into will be the rating for that supplier.

TA Purchasing Department will email individual supplier performance reports as required for any suppliers with a Yellow or Red rating. Any disputes should be promptly reported to your Purchasing contact. Only the TA Director of Quality and/or Purchasing Manager can approve any changes to a supplier's performance status.

3.5 COST RECOVERY

TA may pursue justified expenses from suppliers resulting from quality and/or delivery issues. TA may recover costs for any charges incurred from the receipt of nonconforming materials, such as, but not limited to, line shutdowns, sorting, rework, value added, certification discrepancies & special transportation / expedited shipping costs. Reimbursement of the following expenses may be requested from a supplier at the full rate or at a lesser rate (shared responsibility) as determined by TA.

All TA costs and labor used to convert, sort, or transport nonconforming supplier products will be billed back to the supplier at the prevailing labor and overhead rate. This will be acknowledged to the supplier prior to debiting. Any questions and or concerns, please contact either TA Purchasing / Director of Quality.

3.6 TA Supplier Quality System Survey/Audit

TA Supplier Quality System Survey/Audit checklists reflect the elements expected of an effective quality system and will be used by TA in the evaluation of a supplier's quality system. The evaluation should not be confused with a supplier rating system which includes product quality escapes and on-time delivery performance factors.

3.6.1 The Quality System section (4.0) of this manual allows suppliers to understand our minimum expectations, in advance of an TA assessment, and provides a basis for periodic self-assessments.

3.6.2 Although all quality system elements herein may not be directly applicable to every supplier, the methodology for obtaining quality improvement, including the utilization of statistical methods for process planning, analysis and control is strongly recommended for all suppliers. The design and operation of the supplier's quality system must direct the quality approach toward prevention of defects through advanced quality planning and process control techniques in place of defect detection through inspection or test methods.

3.6.3 All directed corrective action plans will be tracked by TA Quality Assurance department and reassessed when corrective actions have been implemented and closed.

4 QUALITY MANAGEMENT SYSTEM (QMS)

TA has fully adopted the requirements of AS9100 Revision D as the foundation for our Quality Management System (QMS). The contents of this section (4.1 thru 4.7) both reflect and are intended to act as a guide for suppliers as to TA minimum expectations.

The expectation is that suppliers become AS9100 or ISO 9001 registered, however, suppliers must be in compliance to TA requirements as set forth in this Supplier Quality Manual at a minimum.

4.1 MANAGEMENT RESPONSIBILITY

The supplier's management team will define and document its quality policy, including objectives and its commitment to quality and on time delivery. The supplier will ensure that their quality policy is communicated, understood and maintained at all levels within their organization.

The supplier's quality organization should:

- Operate with full authority to facilitate control;
- Identify and correct identified problems;
- Define and document the responsibility and authority of all personnel affecting quality.

The supplier's management team should review the quality system at defined intervals sufficient to ensure its continuing effectiveness. The supplier should retain documented information of all quality system reviews. The reviews should include at a minimum:

- Results of internal audits;
- Management effectiveness;

- Quality and delivery nonconformance's;
- Resolution of customer complaints;
- Identification and resolution of internal and external quality problems;
- Adequacy of applied statistical techniques.

To ensure economic viability, the supplier should:

- Base goals and plans on competitive analysis that cover both short-term and long-term objectives for quality and delivery improvements;
- Document quality, delivery and operational performance trends;
- Compare data and information to business objectives;
- Generate and prioritize solutions and continuous improvement efforts;
- Document and utilize processes for determining overall customer satisfaction.

4.2 QUALITY SYSTEM

4.2.1 GENERAL

The supplier's quality system should reflect management's business philosophy and decisions concerning quality.

Suppliers should establish a system as a means of ensuring that their product and/or service conform to specified requirements. It's recommended for the system to maintain and retain documented information.

It's recommended for Suppliers to define and document how the requirements for quality will be met, however not required.

It's recommended for Suppliers to establish and maintain an Advance Product Quality Planning (APQP) system which should be an integral part of product development, tooling and equipment design and selection, manufacturing methods and inspection information.

It's recommended for Suppliers to develop internal cross-functional teams to prepare for production of new or changed products. These cross-functional teams should typically include manufacturing, engineering, quality, production and purchasing personnel. It's recommended for Suppliers to review product designs for manufacturing feasibility and cost savings opportunities.

Advanced Product Quality Planning (APQP):

- The procurement and review of TA drawings and applicable specifications;
- Selection of sub-tier suppliers and the communication of requirements;
- Feasibility assessment of drawing and/or specification requirements as to whether control of specified requirements can be consistently achieved;
- Determination of inspection requirements;
- Procurement and qualification of measuring and test equipment;
- Identification of any defined Key Characteristics for processing under Statistical Process Control (SPC) and the performance of necessary Gage R&R studies;
- Preparation of quality retained information.

4.2.2 CONTINUOUS IMPROVEMENT

A strong continuous improvement philosophy should be evident throughout the supplier's organization. Suppliers should continuously strive to improve quality, service, delivery and cost. Specific action plans should be identified and developed for continuous improvement in all elements of the supplier's organization. Appropriate measurements should be use for determining the effectiveness of continuous improvement efforts.

4.2.3 FACILITIES AND TOOLING MANAGEMENT

Suppliers should use a cross-functional team approach for developing facilities, processes and equipment plans in conjunction with the Advanced Product Quality Planning (APQP) process. Plant layouts should minimize material travel and handling, facilitate synchronous material flow and maximize value-added use of floor space.

Mistake proofing is the use of process or design features to prevent the manufacture of non-conforming and/or undesirable product. Mistake proofing methodology should be considered during the planning of processes, facilities, equipment and tooling as well as during problem resolution.

Suppliers should provide the appropriate technical resources, either in house or contracted services, for tool and gage design, fabrication and application. TA owned tools and equipment will be permanently marked (by TA Aerospace) and shall be properly handled by the supplier so that this ownership is readily apparent.

Suppliers should establish and implement a system for tooling management, including:

- Maintenance of tooling and facilities;
- Preservation of tooling while in storage;
- Set-up verifications (first part produced);
- Tool modifications (including tool design documentation when appropriate).

4.3 CONTRACT REVIEW

It's recommended for the supplier to establish and maintain documented information for contract review and for the coordination of these activities. Prior to acceptance, it's recommended for the supplier to review the Purchase Order (contract) or order to ensure that:

- All requirements and terms of acceptance are adequately defined and understood;
- Any differences between the order and the request for quote are resolved;
- The supplier has both the capability and capacity to meet all Purchase Order (contract) delivery requirements;
- All requirements, including those specified in this manual, can be met.

It's recommended for the supplier to maintain documented information for disseminating provisions of the Purchase Order (contract) to all appropriate parties. It's also recommended for the supplier to identify how an amendment to a Purchase Order

(contract) is made and correctly transferred to the applicable functions within the organization. Contract review activities should be formally documented and recorded of Purchase Order (contract) reviews should be maintained, however not required.

4.4 PRODUCT DEVELOPMENT AND DESIGN (when required)

As TA is also a build to print facility, when customers required design input from TA, our impacted suppliers is encouraged to participate as well. At any given time, a supplier may be requested to attend a design review as an expert in a particular process and/or commodity. TA goal is to optimize total cost and to reduce both the new product development cycle and lead-time to the customer.

The supplier's ability to provide rapid prototyping (short lead times) for new product designs is key to reducing the new product development cycle.
Supplier's expertise in value engineering, concurrent design and rapid prototyping/cycle time reduction, as well as their willingness to participate on joint teams, will be a key element in the supplier selection process.

4.5 CONTROL OF DOCUMENT

4.5.1 PROPRIETARY INFORMATION

TA information such as drawings, materials used, technology, customers, and financial information should be considered proprietary information. As such, the supplier will not divulge this information to other parties. In particular, drawings of parts designed by TA are proprietary and as such, the supplier shall not manufacture parts from these drawings for any party other than TA.

4.5.2 DOCUMENT AND DATA CONTROL

It's recommended for Suppliers to establish and maintain documented information to control all documents and data that relate to product and process requirements and the requirements of this manual. The system should include requirements for the review, approval, distribution and control of revised documents. Documents should include, but not be limited to, TA Engineering drawings and Process Standards, aerospace specifications and standards, inspection/test instructions and documented information. Documents can be in the form of any type of media, such as hard copy or electronic media.

Document and data control should include:

- The review and approval for adequacy by authorized personnel prior to issue. A master list or equivalent document should be maintained to identify current revision status and delineate the distribution of applicable documents;
- The assurance that pertinent issues of all appropriate documents are available at all operation locations essential to the effective functioning of the quality system;
- The review and approval of changes to documents by the same organization/function that performed the original review and approval;
- The assurance that obsolete documents are promptly removed from all points of use and destroyed or suitably identified.

4.5.3 RETAINED DOCUMENTED INFORMATION

Documented information should be established and maintained for the identification, collection, access, filing, storage and disposal of quality information. Retain documented information should be maintained to demonstrate conformance to specified requirements and the effective operation of the quality system. Retained information should be stored and retained in such a way that they are readily retrievable. Retained information is to be stored in facilities that provide a suitable environment to prevent damage or deterioration and to further prevent any possible loss.

4.5.4 RECORD RETENTION

All retained information related to products and/or services are to be kept for a minimum of ten (10) years and must be traceable to the specific part number and shipment lot.
Retained information developed to support a supplier's quality system (not product related) should have the appropriate retention periods specified by the supplier in their documented information.

4.6 TRAINING

Maintained documented information for identifying training needs to ensure that all personnel are capable of performing their duties consistent with the quality system.

Training elements should include:

- Qualifying personnel on the basis of appropriate education, training and/or experience, as required. These qualification requirements should be formally identified and documented with respect to the responsible tasks being performed;
- Identification and development of applicable training resources;
- Retained information for individual certification and training of personnel;
- Periodic review and evaluation of training effectiveness and the determination of any additional training needs.

4.7 SERVICING

Where servicing is a specified requirement, the supplier should establish and maintain documented information for performing and verifying that the servicing meets the specified requirements.

5 PRODUCT QUALIFICATION

5.1 FIRST ARTICLE INSPECTION REPORT

As a minimum, a First Article Inspection (FAI) is required to initially qualify a part/process for Supplier approval. Furthermore, a new FAI may be requested if there is an extended gap of time since last production. This will be subject to verification during an on-site initial / annual audit. Any concerns in this regards should be communicated to the appropriate buyer.
The FAI requires that all features and characteristics on the design specification and control plan be inspected and verified prior to production. Actual measured values shall be recorded

as opposed to general statements of conformance or other notations simply indicating acceptance.

5.2 COUNTERFEIT PARTS PROTECTION

Each supplier shall plan, implement, and control processes, appropriate to their organization and the product of counterfeit or suspect counterfeit part use and their inclusion in product(s) delivered to TA.
NOTE: Counterfeit part prevention processes should consider the following:

- Training of appropriate persons in the awareness and prevention of counterfeit parts;
- Application of a parts obsolescence monitoring program;
- Controls for acquiring externally provided product from original or authorized manufacturers, authorized distributors, or other approved sources;
- Requirements for assuring traceability of parts and components to their original or authorized manufacturers;
- Verification and test methodologies to detect counterfeit parts;
- Monitoring of counterfeit parts reporting from external sources
- Quarantine and reporting of suspect or detected counterfeit parts

6 PROCESS CONTROL

The supplier must identify and plan the production processes directly affecting quality and should ensure these processes are performed under controlled conditions. Process control methods for each product should be derived from the APQP functions detailed in section 4.2.1 of this manual.

6.1 PRODUCT IDENTIFICATION AND TRACEABILITY

It's recommended for Suppliers to establish a lot control and traceability system that provides for positive identification and documentation for each lot or batch of product from receipt of raw material through fabrication, processing, storage and shipment. Traceability should be maintained through the use of a unique identifier assigned to each lot of material or product.
It is the supplier's responsibility to assure that lot control and traceability is extended to all sub-tier suppliers. In addition, suppliers (and its supply chain) are responsibility to ensure that the use of acceptance authority media (AAM) is clearly defined within their Quality Management System (QMS). This is subject to review during the on-site audit.

6.2 WORK INSTRUCTIONS

The supplier should maintain documented information for manufacturing processes. This documented information should be accessible and include or reference as appropriate:

- Part number and name
- Current engineering drawing revision level
- Required tooling, equipment and gages
- Material identification and procurement instructions
- TA and/or supplier designated Key Characteristics
- Relevant engineering and manufacturing standards
- Inspection and test instructions

- Set-up (first article) instructions
- Equipment and tooling definitions to ensure continued quality production.

6.3 PROCESS CAPABILITY STUDIES

The application of Statistical Process Control (SPC) is required for TA and/or supplier designated Key Characteristics. A target long-term process capability index of 1.33 Cpk or higher is desired. Process capabilities falling short of this requirement will require a modified sampling plan that effectively doubles the number of samples for the same lot size to effectively decrease TA risk of receiving nonconforming product. TA recommends suppliers to conduct 100% product inspection for a process capability index of 1.00 Cpk or lower.

6.4 CAPABILITY ASSESSMENT FOR KEY CHARACTERISTICS

Suppliers (when required) must be able to demonstrate process capability for each agreed upon Key Characteristic. Process capability should be reported in the form of a capability index ratio (Cpk) and must be accompanied by a control plan and appropriate control chart that illustrates process stability.

6.5 MAINTENANCE, REGULATIONS, ENVIRONMENT

Suppliers should identify key processing equipment, provide appropriate resources for equipment maintenance and develop an effective preventive maintenance program. The preventative maintenance system should include maintained documented information for planned and scheduled maintenance activities, as well as providing for the preservation of equipment, tooling and gaging. Suppliers should ensure compliance with all applicable government safety and environmental regulations, including those concerning handling, recycling or disposing of hazardous materials. Suppliers must maintain a work environment conductive to good quality of work which will promote continuous improvement and the appropriate state of order, cleanliness and repair.

6.6 INSPECTION AND TESTING

Suppliers should maintain documented information for inspection and testing activities in order to verify that all specified requirements for the product are met. The required inspection and testing, acceptance criteria, and the corresponding information, should be retained. **Note: The acceptance criteria for TA product is based on the Supplier Performance Rating in section 2.3.4 with the long term target goal of zero defects (C=0) regardless of lot size.**

Inspection and testing information should provide for the following:

- The assurance that incoming product is not used or processed until it has been inspected and/or verified as conforming to specified requirements. All verification activities must be documented. Receiving Inspection should include the review and approval of subcontractor submitted quality documents such as material test reports and certifications.
- In-process inspection and testing (when appropriate) for all specified characteristics. Note: All process activities should be directed towards defect prevention methods in

lieu of defect detection.

- The discontinuation of production between planned operations until the required inspections have been completed with conformance verified, unless otherwise planned and controlled.
- Final inspection to ensure conformance of the finished product to all specified requirements.
- Establishing and retaining documented information, which provides evidence that the product has been inspected and/or tested. This information should clearly show whether the product has passed or failed the inspections according to defined acceptance criteria. This information must also identify the inspection authority responsible for disposition and release of the product.
- The utilization of TA approved suppliers to include NADCAP accredited facilities for the specific special processes being performed.

6.7 TA INSPECTION AND REJECTION

When TA performs an inspection or test on the supplier premises, the supplier should furnish without additional charge reasonable facilities and assistance for safe and convenient performance of these inspections or tests. TA may reject any product that does not fully conform to all specified requirements of the applicable order. TA by email notice, rejection tag or other communications will notify the supplier of such rejection.

Rejected products may be returned to the supplier at the supplier's expense. This will be for immediate replacement and/or corrections to the parts and redelivery to TA. All replacements and/or corrections and redelivery should be completed within such time as TA may require. All costs, expenses, loss of value and any other damages incurred as a result of, or in connection with, nonconformance and replacement or other correction may be pursued by TA.

6.8 CONTROL OF MEASURING AND TEST EQUIPMENT

Suppliers should maintain documented information for the control, calibration and maintenance of measuring and test equipment used to determine product conformance. This requirement includes employee owned gages (if appropriate). This information should include:

- Selection, maintenance and accessibility of measuring and test equipment to provide the necessary verification of requirements to the required level of accuracy and precision.
- Requirements for the calibration of measuring and test equipment, both upon receipt and at prescribed intervals, against certified equipment having a known valid relationship to internationally or nationally recognized standards (NIST).
- Definition of the process for the recall and calibration of measuring and test equipment. The necessary calibration equipment, location, calibration method, acceptance criteria and the required actions for unsatisfactory results should be documented.
- Identification of measuring and test equipment with a visible indicator (label) and supporting record that reflects calibration status. Whenever possible, equipment should be identified with the last date of calibration, personnel who performed the calibration

and the next calibration due date.

- Assurance that environmental conditions are suitable for the calibrations, inspections, measurements and tests being performed and the handling, preservation and storage of equipment is such that the accuracy and fitness for use is maintained.
- The maintenance of calibration retained information to include gage conditions and actual readings both prior to (if adjustments are necessary) and after calibration/verification. This information should also include the actions taken if a piece of equipment is found not to pass calibration requirements. These actions must include customer notification if suspect material has been shipped.

6.9 INSPECTION AND TEST STATUS

Product must be identified by a suitable means (markings, stamps, tags, labels, etc.) and physically held in designated locations to indicate the conformance or nonconformance of product with regard to inspection and tests performed.
The identification of inspection and test status must be maintained throughout all phases of production to ensure that only conforming product is released for delivery to TA.
The location of product in the normal production flow may constitute suitable indication of inspection and test status if inherently obvious and clearly defined in documented information.

6.10 CONTROL OF NONCONFORMING PRODUCT

Suppliers should maintain documented information to ensure that nonconforming product is prevented from unintended use and/or delivery to TA. This information must include:

- A control system that provides for visual identification, documentation, segregation, evaluation and disposition of nonconforming product
- The responsibility for review and authority for the disposition of nonconforming product. Nonconforming product shall be both reviewed and dispositioned (rework, scrap and/or submit for customer disposition) in accordance with documented information.
- Rework must be performed in accordance to documented instructions and these instructions must be both accessible and utilized by all responsible personnel. Reworked product must be re-inspected to the original acceptance criteria and in accordance with the documented instructions.
- Recording of all non-conformances to allow for defect trend analysis and the generation of internal corrective action plans (whenever appropriate).

TA written approval is required prior to shipment of product not conforming to all drawing and/or specifications requirements as previously discussed in this manual. Shipping documents and the exterior shipping container with non-conforming product shipped under an approved deviation should be properly identified.

6.11 SUPPLIER DISCLOSURES

Suppliers will be required to immediately notify TA Quality Assurance in writing when discrepancies in supplier's processes or products are discovered or suspected to exist in any products delivered to TA.

6.12 CORRECTIVE ACTION

Suppliers should maintain documented information for implementing corrective action. Suppliers should document these actions and, when applicable, retain any changes to documented information resulting from corrective actions.

Corrective action information should include:

- The effective handling of customer complaints, product nonconformities and late deliveries;
- Investigations to determine the root cause of nonconformities or complaints;
- Determination of the corrective action needed to eliminate the root cause;
- Application of controls to ensure corrective action is implemented and effective through the use of mistake proofing methodologies (whenever possible);
- Submission of relevant information on corrective actions taken for management review.

Inherent in the relationship between TA and its suppliers is the willingness of suppliers to assume complete responsibility for the quality of their product. In the event TA experiences a quality related problem with a supplier's product (either at the point of receipt, during production or when determined to be the root cause of a TA customer rejection), the supplier is expected to cooperate fully in all investigations and the implementation of effective corrective action to prevent future recurrence.
In the event TA detects supplier product to be nonconforming after receipt, and production scheduling prohibits return to the supplier, TA reserves the right to perform the necessary sorting and/or rework of that product at the supplier's expense. Additional associated costs, as result of the nonconformance, may be charged back to the responsible supplier.

Risk mitigation information should include:

- Detection and elimination of potential causes of nonconforming product and/or services;
- Review of information such as internal and external nonconformance reports, audit results, quality retained documented information and customer complaints;
- Determination of steps needed to handle problems requiring risk mitigation;
- Initiation of risk mitigation and application of controls to ensure the effectiveness of that action;
- Submission of relevant information on mitigation of risks taken for management review.

6.13 INTERNAL QUALITY AUDITS

Suppliers should maintain documented information for performing internal quality audits to verify conformance of quality activities and to determine the effectiveness of their quality system.

Elements of the internal quality audit process should include:

- Definition of suitable intervals for performing internal quality audits on the basis of the importance of the activity being audited and/or the results of prior audits
- The performance of internal quality audits by personnel independent of those having

direct responsibility for the activity being audited
- The recording of audit results and the reporting of those results to the personnel having responsibility for the area audited
- Timely corrective action is taken for deficiencies found during the audit by management personnel holding responsibility for the area that was audited
- Follow-up activities are conducted to verify the implementation and effectiveness of the corrective action taken.

7 CHANGE CONTROL

The Supplier is responsible for controlling changes and notifying the TA Buyer of all changes to the approved part design, manufacturing process, or site.

7.1 CHANGE CONTROL PROCESS

The Supplier shall have a process to ensure that relevant versions of applicable documents furnished by TA (as well as those specified of external origin) are available at points of use.
The Supplier is responsible for the timely review, distribution and implementation of all TA Engineering standards/specifications and changes in accordance with the schedule required by TA. Timely review should be as soon as possible, and shall not exceed two working weeks. The Supplier shall maintain a record of the date on which each change is implemented in production. Implementation shall include updated documents.

7.2 SUPPLIER CHANGE REQUESTS

Suppliers shall not make changes to their processes, location, facilities, equipment, material, product design (or any change which may affect product design or function) without written approval from the
TA Buyer for:
- Correction of a discrepancy on a previously submitted part;
- Product modified by an engineering change to design records, specifications, or materials
- Any planned changes by the Supplier to the design, process, or manufacturing location, such as:

a) Use of other material than was used in previously approved part or product
b) Production from new, additional, replacement or modified tools, dies, molds, patterns, etc.
c) Production following upgrade or rearrangement of existing tooling or equipment
d) Production from tooling and equipment transferred to a different plant site or from an additional plant
e) Change of sub-tier Supplier for parts, nonequivalent materials, or services (e.g. heat treating, plating, etc.)
f) Product produced after tooling has been inactive for production for 12 months or more
g) Change to test/inspection method – new technique (no effect on acceptance criteria)
h) For bulk materials: new source of raw material from new or existing Supplier, or change in
product appearance attributes, etc.
Before submitting to TA a request for a permanent change to a Supplier-controlled design, the

Supplier may need to review the FMEA and Control Plan, as applicable, to ensure that all process-related issues have been addressed and resolved.

7.3 COST REDUCTIONS AND PROCESS IMPROVEMENTS

Suppliers are expected to recommend both product and process improvements to reduce total costs. TA must receive timely notification of such changes to assess any potential impact to functionality of the final product. Purchasing and Supplier Quality Assurance will aggressively pursue product/process improvements to reduce costs. Cost improvements and lead time reductions that are initiated by the supplier should be directed to the appropriate buyer for review and the determination of necessary approvals (TA Engineering review and approval is mandatory for any changes to product design and or process requirements).

8 SPECIAL PROCESSES

Special processes refer to processes from which the results cannot be fully verified by subsequent inspection and testing of the product and where processing deficiencies may become apparent only after the product is in use. Special processes include, but are not limited to, the following:

- Heat treatments for metals;
- Welding and brazing;
- Surface treatments (such as shot peening, passivation, etching);
- Nondestructive testing (such as Magnetic Particle, Fluorescent Penetrant, Ultra Sonic);
- Plating and coatings.

The following should be documented for all special processes:

- Definition of process parameters including acceptance criteria;
- Monitoring and verification of compliance with those parameters;
- Qualification of personnel;
- Qualification of equipment.

Only TA approved sources can be used for the performance of special processes with NADCAP accreditation being a mandatory requirement for that approval. Additional customer specific approvals may be required (i.e. Boeing D1-4426) and such requirements will be established through the purchasing process.

9 PURCHASING

Suppliers are expected to require the same defect-free level of quality from their suppliers as that required by TA. The supplier should ensure all products and services conform to specified requirements.

The documented information should include:

- The evaluation and selection of subcontractors on the basis of their capabilities relative to quality requirements and on time delivery
- An approved suppliers list from which product and/or services may be purchased. Additional subcontractors may only be used after they have been added to the list by

an appropriate approval process

- A system for periodic assessment of suppliers with retained information used to evaluate performance. Past performance history of a given supplier should be used in sourcing decisions.

Purchasing documents must clearly describe the product and/or service being purchased and refer to the appropriate revision of the applicable specification for the product and/or service. The supplier should review and approve purchasing documents for adequacy of specified requirements prior to release.
The use of TA designated subcontractors does not relieve the supplier of the responsibility for ensuring the quality of subcontracted products and/or services.
When specified in the Purchase Order (contract), TA and/or its customers should be afforded the right to verify at both the subcontractor and the supplier's premises that subcontracted product conform to specified requirements. Such verification by TA or its customers should not absolve the supplier of the responsibility to provide acceptable product, nor should it preclude subsequent rejection by TA.

9.1 Deliverable Document Requirements

The table below summarizes the requirements for each shipment based on the Part Number 'Quality Type'.
The 'Quality Type' of each part is stated on the PO.

Quality Type	AS9100 & ISO9001 REQUIREMENTS APPLY
Inspection Requirements	• Acceptance criteria for TA product is based on the Supplier Performance Rating in section 2.3.4 with the long term target goal of zero defects (C=0) regardless of lot size • SPC data when applicable • AQL Sampling Plan
C of C	Signed, dated containing part number, part Rev and PO#, and as applicable, Lot Number, Heat Lot Number, Sales Order and/ or Serial Number
Material Verification	Metals- Certificate of Analysis to the required specification Plastics- Certificate of Conformance from the raw material manufacturer to the required specification Rubber- Certificate of Analysis to the required specification
Special Process Certs	C of C from supplier performing 'Special Process'
Initial Production or Revision Changes	First Article
Quality System Requirements	TA Approved Supplier

9.2 CONTROL OF CUSTOMER SUPPLIED PRODUCT

It's recommended for the supplier to maintain documented information for the verification, storage and maintenance of TA supplied product, inspection equipment, tooling and returnable packaging (if applicable). Any such product or tooling that is lost damaged or is otherwise unsuitable for use should be recorded and promptly reported to the TA.

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10 SHIPPING, PACKAGING AND TRACEABILITY

Suppliers should maintain documented information for the handling, storage, packaging, preservation and delivery of product.

This information should include:

- Handling methods that are designed to protect product from damage and deterioration;
- Storage areas with adequate levels of preservation that will prevent product damage and deterioration.
  Note: In order to detect deterioration, the condition of product in storage should be assessed at appropriate intervals.
- Documented information that ensure the security of product while in storage with a means to control authorization of receipt and dispatch;
- The control of packaging and processes to the extent necessary to ensure conformance to specified requirements;
- Documented information to ensure the delivery of required certifications and/or test reports with the physical product. TA requires certifications and/or test reports to be placed in an easily accessible marked box with the product shipment;
- Parts should be packaged to TA quantity and or container size specifications when specified. If containers are used, they should be identified with the part number, quantity and Purchase Order number as a minimum. Additional markings and or information may be requested by TA purchasing team.
- The contract or Purchase Order will define, as applicable, the method of shipment, the shipment destination, if any special packaging requirements and any additional part identification instructions are needed.
- If specific packaging instructions are not specified, the supplier is responsible to take the necessary measures to prevent product damage during shipment.
- Parts must be free of any loose and/or flaking deposits that can be rubbed off or that may impact the functioning of the final product (FOD). This includes, but is not limited to: metal debris, rust, scale, cleaning media and other foreign matter. PARTS MUST BE RETURNED IN THE SAME ORDER IT WAS PROVIDED BY TA.
- If specific part identification/tagging instructions are not identified on the drawing or the Purchase Order, the supplier shall at a minimum include the part number and Purchase Order number on the part identification tag or box.
- All required paperwork, as specified by the Purchase Order, must be included with the product shipment.
- Returnable dunnage/containers may be required as certain parts may have unique requirements. Any special requirements will be included in a TA Purchase Order. If a supplier has any issues with this requirement, please contact your buyer prior to acceptance of that Purchase Order.
- TA has a lean manufacturing philosophy and we may use many techniques (Just-In-Time, Kanban etc.) to keep inventory to a minimum.
- Suppliers will use endorsed carriers when TA incurs transportation costs. A list of endorsed carriers is available from the buyer.
- Suppliers are responsible to assure that all products produced will:

- Comply in all aspects to the specifications of TA and any approved samples and representations of the Supplier;
- Be free from all defects in materials, design, and workmanship; FOD
- Comply in all respects with all applicable industry standards and be fit for the intended purpose.

THIS COMPLETES THE SUPPLIER QUALITY MANUAL. FOR ANY QUESTIONS AND OR COMMENTS IN REGARDS TO THIS MANUAL PLEASE CONTACT YOUR APPROPRIATE BUYER AND OR TA QUALITY ASSURANCE DEPARTMENT

Revision History			
Revision	**Date**	**Description of Change**	**Author**
NC	1/6/17	Initial Development & Release	K. Redeemer
A	6/16/17	Revise Rating Criteria	K. Redeemer
		Removed Preventative Action from Manual	
		Typo under Conditional Suppliers	
		Added breakdown for Vendor OTD Scoring	
		Added Counterfeit Parts Prevention Section 7.0	
		Additional information added to Probationary status	
B	2/26/19	Revise Rating Criteria	X. Cerna
		Revised form Titles in section 2.3	
		Updated Names (Leaders and Company Name) and Logo	
		Removed Source Delegation Section	
		Omitted repeat statement	R.Ahmadi
		Added Sampling Plan	
C	10/22/2019	Revised Supplier Qualification process responsibility	R.Ahmadi
		Added Supplier Disclosures	
		Added deliverable document requirement	