

## 1.0 Purpose and Scope

This document outlines ThinKom Solution's (Buyer's) product quality and quality management system requirements in addition to those shown on the engineering drawing. This document of quality requirements is both referenced and flowed down on the ThinKom Solutions purchase order.

**Note: Supplier questions or requests for clarification should be submitted in writing to the appropriate ThinKom Solutions' Buyer personnel. Exceptions can only be taken as prescribed within section 4.2.**

## 2.0 Responsibility

The Director of Quality Assurance is responsible for compliance with this procedure. Implementation of this procedure will be carried out by the Supply Chain Group.

The Supplier is responsible for meeting all of the applicable requirements contained within this document. The latest revision of this document is available via a link on the ThinKom Solutions' website. Additionally, all suppliers are required to ensure that their personnel are aware of:

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

## 3.0 Definition of Key Terms and acronyms

- **AS9102**, SAE Aerospace First Article Inspection Requirement
- **COTS: Commercially Available Off the Shelf**: A Commercial Item sold in the commercial marketplace and offered to the Buyer without modification in the same form in which it is sold in the commercial marketplace.
- **Quality Management System (QMS)**: The managing structure, responsibilities, procedures, processes, and resources to effectively achieve the quality and overall objectives of an organization, in order to satisfy customer needs and expectations.
- **NADCAP**: National Aerospace and Defense Contractors Accreditation Program
- **Supplier**: Organization or person that provides a good or service. For the purposes of this document, organizations that receive purchase orders and/or letters of subcontract are defined as suppliers.
- **AS9100/ ISO9001**: International Standard for the Aerospace Industry/ Quality Management System Standard.

## 4.0 Procedure

4.1 Requirements applying to all ThinKom Solutions suppliers.

### 4.1.1 Purchase Order

In this document, the term "Purchase Order" or "P.O." is an offer to enter into a contract, which is accepted by the seller signing and returning a copy, returning seller's own form of acknowledgment, or commencement of performance.

- 4.1.2 Purchase Order requirements flow down - suppliers are required to flow down applicable requirements contained within this document to their sub-tiers including specific ThinKom Solutions' customer requirements such as OEM, government/ military, FAA, and others that may be specifically identified on the ThinKom Solutions purchase order.
- 4.1.3 Point of Contact  
Suppliers point of contact at ThinKom Solutions will be the Buyer referenced on the purchase order. Any questions, problems, or information should always be directed to the Buyer. **Supplier shall not accept any change to the technical and quality requirements unless authorized in writing by the Buyer and/or approved Supplier Request For Deviation (SRD see section 4.4).**
- 4.1.4 Supplier Rating System  
ThinKom Solutions maintains a supplier rating system to track the supplier's performance of contractual, P.O., specification, and Quality requirements. Any non-compliance with the specified requirements will affect suppliers rating and approval status. It is important that a supplier responds to any Corrective Action Request (CAR) completely and within the time specified on the CAR. Failure to do so will affect suppliers rating and approval status.
- 4.1.5 Non-Conforming Material  
**(Ref. 14 CFR 21.137 (c) 2)**
- Unless specifically authorized, in writing by the ThinKom Solutions Buyer, supplier is not authorized to make use-as-is and/or repair dispositions of nonconforming material. Should you discover nonconforming material that you feel would be in ThinKom Solutions interest to accept, you should contact the Buyer for instructions or see SRD section 4.4.
- Products, articles or services that have been released/shipped and subsequently found to have not conformed to ThinKom requirements (Quality Escapes), must be immediately reported to ThinKom for appropriate action and possible FAA reporting.
- 4.1.6 Certifications, Traceability and Test Reports  
**(Ref. 14 CFR 21.137 k)**
- 4.1.6.1 The supplier shall retain all test reports and/or certifications on file for a minimum of ten (10) years from payment of this order. Records shall remain legible, readily identifiable and retrievable. Record identification, storage, protection, retrieval, and disposition of records shall be in accordance with the supplier's company policy.
- 4.1.6.2 In the event reports of electrical, functional, mechanical, environmental, or other tests are required with each shipment the reports shall include as applicable:
- ThinKom Solutions Purchase Order number or Blanket Purchase Order number with released number.
  - Item description.
  - Drawing/Specification and Revision used.
  - ThinKom Solutions Part Number and applicable Revision.
  - Acceptance limits of test parameters.

- f. Number of units tested.
  - g. Serial number of units tested, as applicable.
  - h. Lot/date code, as applicable.
  - i. Recorded Test Data/Test Results.
- 4.1.6.3 A Certificate of Conformance is required with each shipment. The certificate shall be signed by an authorized representative and include as applicable:
- a. ThinKom Solution purchase order and line item number(s).
  - b. Part number(s).
  - c. Serial number(s) as applicable.
  - d. Specification(s) as applicable – Raw Material Certs
- 4.1.7 Lead-Free Components and Assemblies
- 4.1.7.1 Documentation  
The replacement of lead-containing solder in ThinKom Solutions assemblies such as CCA's must be positively identified in the documentation sent to ThinKom Solutions.
- 4.1.7.2 Component and Assembly Identification/Approval  
Suppliers must identify components or assemblies that introduce no-lead "green products" products into ThinKom Solutions' shipment. The location of the "Lead Free" identification shall be on the product and shipping container.
- 4.1.8 Packaging and Handling Requirements
- 4.1.8.1 Product must be handled, stored and packaged to prevent damage or deterioration.
- 4.1.8.2 Identification and packaging of electrostatic sensitive parts and/or assemblies shall be in accordance with the electrostatic protection requirements of ANSI/ESD S20.20 (ESD Association Standard).
- 4.1.8.3 Supplier shall maintain a Foreign Object Damage (FOD) prevention program compliant to AS9146 FOD Prevention Program – Requirements for Aviation, Space, and Defense Organizations.
- 4.1.9 Inspection and Surveillance  
**(Ref. 14 CFR 21.310)**
- 4.1.9.1 First Article Inspection  
First Article Inspection (FAI) is required for the first item(s) of the first lot produced and a delta FAI is required for all part revisions or process changes. Suppliers are expected to conduct First Article Inspections that meet the requirements of AS9102. However, Buyer's minimum requirement is a complete itemized FAI verification of all drawing requirements for any parts built to Buyer's specifications, including modifications to COTS parts. The Supplier shall use a representative item from the first production run of a new product to verify that the production processes, documentation, and tooling have the capability to produce products that meet established requirements. This is defined as one or more parts that are the result of a planned process designed to be used for future production of these same parts. This process shall be repeated when changes occur including but not limited to

engineering changes, manufacturing process changes and tooling changes.

- a. Unless required within the Purchase Order (PO), the FAI requirements stated above do not apply to: 1) development and prototype parts that are not considered as part of the first production run, 2) Unique single run production orders, not intended for ongoing production (e.g., out-of-production spares) 3) Procured standard catalogue items, COTS, or deliverable software.
  - b. The Supplier shall include a copy of the FAI report with the delivery of the PO line item and identify part used to complete the First Article as appropriate.
- 4.1.9.2 Quality Conformance inspection shall be in accordance with the applicable drawing specification requirements, including special characteristics measurement data retention and verification of those characteristics identified for sample inspection.
- 4.1.9.3 The following shall not be performed or implemented without written approval from ThinKom Solutions:
- a. The supplier and its sub-tier suppliers shall not repair any item found to be faulty or damaged during the manufacturing process by using adhesive, welding, brazing, plating, splicing, or soldering.
  - b. Defects in castings or forging shall not be repaired by any method.
  - c. The supplier shall not change the product or change any drawing, process, material, or procedure previously approved by Buyer including those used to qualify items or which were used by the supplier to become a qualified source.
- 4.1.9.4 ThinKom Solutions reserves the right to conduct surveys and inspections at the Supplier's facility and Supplier's supply chain, to evaluate compliance with this Purchase Order and all applicable requirements, including the right to perform Source Inspection on deliverable products. This includes the auditing of records created by and/or retained by the supplier for ThinKom Solutions deliverable product. When required, Buyer will provide prior written notification to arrange audits or inspections. Seller shall provide right of access to Buyer, Buyer's customer and regulatory authorities to applicable areas of all facilities, at any level of the supply chain involved in the order, and to all applicable records.
- 4.1.9.5 Supplier shall notify the Buyer of its intention to deviate from using a supplier stated on Buyer documentation and first obtain written approval from Buyer before supplying Product to Buyer using such new supplier.
- 4.1.9.6 Supplier shall notify the Buyer of change in its manufacturing facility and first obtain approval from Buyer before supplying Product to Buyer from such facility.
- 4.1.10 Non-Conformance Rework and Repair
- 4.1.10.1 The supplier is not authorized to conduct independent MRB activity on ThinKom designed or controlled items. Discrepant conditions requiring MRB disposition for repair and use as is shall be documented on a **Supplier Request for Deviation** (SRD see 4.4) form and submitted to ThinKom Solutions through the applicable Buyer for disposition and approval. The supplier shall place nonconforming material in bond, pending disposition and notification by the ThinKom Solutions buyer of the MRB action to be taken.
- 4.1.11 Quality System Requirements
- 4.1.11.1 The supplier's quality system shall be certified to AS9100, ISO 9001, NADCAP or an approved ThinKom Solutions Quality Survey Q4001. ISO 17025 and/or A2LA Accreditation is required

for Calibration & Test Laboratories. The primary supplier named on the purchase order retains full responsibility for ensuring products, supplies, or services furnished comply with all applicable specification/standard requirements for design, construction, and workmanship.

4.1.11.2 ThinKom requires that quality system requirements (4.1.10) be evaluated and resubmitted a minimum of every three years for a supplier to remain on the Approved Supplier List (ASL).

4.1.11.3 The supplier continues to retain full responsibility for compliance to these specification/standard requirements when products, supplies, and/or services are purchased from secondary (sub-tier) supplier(s) that are incorporated into or are used to produce, inspect, or test products or services supplied under the purchase order.

The primary supplier shall:

- a. Provide manufacturer certifications.
- b. Provide (flow down) specification/standard requirements, including key characteristics to sub-tier supplier(s) as applicable.
- c. Ensure, by performing physical and/or functional inspections that sub-tier suppliers have complied with the requirements of this clause.
- d. On demand, provide objective evidence to ThinKom Solutions Quality Assurance personnel of compliance to this clause.

#### 4.1.12 Counterfeit Parts Prevention

4.1.12.1 For the purposes of this clause, Work consists of those parts delivered that are the lowest level of separately identifiable items (e.g., components, goods, assemblies). "Counterfeit Work" means Work that is or contains items misrepresented as having been designed and/or produced under an approved system and materials (reference AS553, AS6081 or similar).

- a. Seller agrees and shall ensure that Counterfeit Work is not delivered to ThinKom Solutions by providing manufacturer certifications or Seller's completed verification checklist with each shipment.
- b. Seller shall only purchase products to be delivered or incorporated as Work to ThinKom Solutions directly from the Original Component Manufacturer (OCM) / Original Equipment Manufacturer (OEM), or through an OCM/OEM authorized distributor chain. Work shall not be acquired from independent distributors or brokers unless approved in advance in writing by ThinKom Solutions.
- c. Seller shall immediately notify ThinKom Solutions with the pertinent facts if Seller becomes aware or suspects that it has furnished Counterfeit Work.
- d. In the event that Work delivered under this contract constitutes or includes Counterfeit Work, Seller shall, at its expense, promptly replace such Counterfeit Work with genuine Work conforming to the requirements of this contract.
- e. Seller shall be liable for all costs relating to the removal and replacement of Counterfeit Work.

#### 4.1.13 Calibration Services Requirements

##### 4.1.13.1 Out of Tolerance Conditions

- a. Upon receipt for calibration, Measurement Test Equipment (MTE) is tested to determine if it is within specification limits before any adjustment, repair, or cleaning which would affect calibration results is performed. If not within specification limits, out of tolerance data is recorded and all work is halted.
- b. ThinKom Solutions Quality Assurance is to be contacted in writing regarding the out of tolerance/ calibration conditions of the MTE.

##### 4.1.13.2 Standards Accuracy

The accuracy of the standards must be at least equal to the tolerance required (i.e., 1:1) but in most cases should be greater. A 1:1 comparison is permitted only when state of the art limitations preclude a higher accuracy ratio. Normally, when only a 1:1 accuracy ratio can be achieved, any out-of-tolerance condition of the MTE will be significant. A 4:1 ratio is required whenever possible.

##### 4.1.13.3 Traceability

All calibration services performed by Subcontractor calibration labs must have calibration systems that meets the requirements of ISO/IEC 17025 and is traceable to National Institute of Standards and Technology (NIST).

#### 4.1.14 Obsolescence and Diminishing Manufacturing Sources and Material Shortages (DMSMS)

- 4.1.14.1 Seller shall immediately notify Buyer in writing of any DMSMS issues related to the Work and provide mitigation plans to avoid interruption of supply.

#### 4.1.15 Electrical Assemblies

- 4.1.15.1 Printed-wiring boards supplied on this purchase order shall comply with the requirements of IPC 6013 - Qualification and Performance Specification for Flexible/Rigid-Flexible Printed Boards, IPC 6012 - Qualification and Performance Specification for Rigid Printed Boards, IPC-A-610 - Printed Board Performance Specifications and IPC J-STD-001 Training and Certification Program.

Reference: IPC-4101 Specification for Base Materials for Rigid and Multilayer Printed Boards, IPC-2223 Sectional Design Standard for Flexible Printed Boards.

- 4.1.15.2 Circuitry testing for shorts and continuity shall be performed 100% for printed wiring boards supplied on this purchase order.
- 4.1.15.3 For parts procured to ThinKom Solutions drawings, the purchase order identifies the appropriate revision letter for each part number. The identification method of marking a part shall be as described on the drawing along with the part number including applicable dash number and Part Revision letter.
- 4.1.15.4 Workmanship for items supplied on this purchase order shall comply with the requirements of the Institute for Interconnecting and Packaging Electronic Circuits (IPC) IPC-A-610, entitled "Acceptability of Electronic Assemblies", and shall meet Class 3 requirements unless otherwise specified on the assembly drawing.

#### 4.2 Exceptions

4.2.1 Supplier is responsible for all applicable requirements of this document. Exceptions should be noted on the Supplier Survey (Q4001) and/or be acknowledged/approved via the Buyer Purchase Order or via an SRD (see section 4.4) per shipment.

#### 4.3 Contract Maintenance Providers

4.3.1 Suppliers (certificated and noncertificated) based in the U.S. performing repair and/or contract maintenance on aircraft components/parts for ThinKom (*as specified on purchase orders*) are required to participate in a U.S. Department of Transportation anti-drug and alcohol misuse prevention program compliant with CFR Title 14 Part 120, Subparts D, E and F.

#### 4.4 Supplier Request For Deviation (SRD)

4.4.1. As prescribed, ThinKom Solution suppliers do not have MRB authority and may not ship defective product and/or parts to ThinKom without written approval. The SRD process is a means by which suppliers who have password access, may communicate defects and/or part issues. The SRD is dispositioned internally by ThinKom Engineering and Quality. The results are then communicated to the supplier regarding further instructions/direction.

4.4.2 An SRD submittal is not authorization to ship defective parts to ThinKom. The SRD must be approved, referenced on the C of C and accompany the shipment for which it applies to.

4.4.3 A supplier may request access to the TKIMs database through the ThinKom Buyer/ Supply Chain group.

4.4.4 SRD's should be the last resort, particularly during full FAI submission. Certain ThinKom customers and/or programs do not allow approval of SRD's that violate drawings.

### 5.0 Revision History

Rev	Description of change	Date	Approved By
--	Initial Release	04/24/13	Stuart B. Coppedge
A	3.1.8.4 Updated to include right of access for Buyer, Buyer's customer and regulatory authorities.	06/25/13	Stuart B. Coppedge
B	Updated 3.1.8.3 to require that supplier obtains approval from Buyer before changing Product. Added 3.1.8.5 & 3.1.8.6 requiring Supplier to notify Buyer of any change in manufacturing facility or change in supplier. Changed 3.1.10.1 to supplier's quality system shall be certified to.... Updated company logo.	08/09/13	Stuart B. Coppedge
C	Document updated to improve format	01/09/15	Douglas Klebe
D	Added paragraph 3.1.13. Added "on ThinKom designed or controlled items" to para 3.1.9.1	11/05/15	Stuart B. Coppedge
E	- Added New Paragraph Section 3.0	02/08/16	Victor R Arias



	- Added new verbiage to Paragraph 4.1.8.1 (FAI AS9102 Requirements)		
F	Rewrote Purpose and Scope. Updated Responsibility section to AS9100 RevD Requirements. Added AS9100/ISO9001 key term. Incorporated Section 4.1.1.1 under Procedure. Eliminated excess amount of wording under 4.1.8.1, First Article Inspection. Added section "b" under First Article Inspection. Added extra wording to Section 4.1.8.2. Updated Section 4.1.10.1 to include NADCAP and approved Supplier Survey. Eliminated Section "c" under Out of Tolerance Condition, Section 4.1.12.1. Changed Section 4.2 to Electrical Assemblies. Corrected typo of Section 3.2.8 to 4.2.8 under 4.2 Electrical Assemblies.	08/14/17	Jay Payne
G	Changed Class 3 to Class 2 in Para 4.2.6, 4.2.7, and 4.2.8	10/12/17	Jay Payne
H	Re-added Class 3 per customer requirement in Paragraphs 4.2.6, 4.2.7 and 4.2.8. Added Raw Material Certs to 4.1.5.3(d). Added ISO 17025 Accreditation for Calibration and Test Facilities to 4.1.10.1. Amended note in 4.1.8.1. Section 3 removed Commercial Item definition.	7/27/18	Jay Payne
J	Added exception sentence to Purpose and Scope. Updated 4.1.8.1 regarding FAI requirements. Added 4.3 Exceptions section	11/7/18	Jay Payne
K	Added 14 CFR 21 references to paragraphs 4.1.5, 4.1.9, added 21.137 (c)2, supplier quality escape requirements. Added A2LA to 4.1.11.1, Added 4.1.11.2 every 3-year resubmission requirement, Added 4.1.11.3. Added references to 4.1.12.1, and added clarity to 4.2 Exceptions.	7/29/19	Jay Payne



L	Updated 4.1.8.2 to reflect ANSI/ESD S20.20 and 4.1.8.3 to reflect AS9146 FOD Prevention Program. Deleted obsolete MIL specs within 4.1.15 Electrical Assemblies and added current IPC specs. Added Sections 4.3 Contract Maintenance Providers and 4.4. Supplier Request for Deviation. Added SRD reference to 4.1.3, 4.1.5 and 4.1.10.1.	3/26/2020	Jay Payne
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Jay Payne

Jay Payne (Mar 5, 2020)

Director of Quality Assurance: Jay Payne

Stuart B. Coppedge

Stuart B. Coppedge (Mar 17, 2020)

Executive Vice President: Stuart Coppedge

Ramon Pradera

Ramon Pradera (Mar 26, 2020)

Director of Supply Chain: Ramon Pradera