

Quality Assurance Provisions (QAPs) are used to communicate to Suppliers additional requirements beyond those defined by a drawing and/or specification(s). Lasertel uses QAPs as part of product acceptance and approval of Supplier’s quality assurance processes.

This document is intended to define Lasertel Inc. quality assurance provisions for inventory materials received from suppliers. It is intended to be used by Suppliers to aid in the quality control of incoming parts.

This document applies to purchase orders (POs) and supply contracts issued by Lasertel’s Purchasing department.

- QAPs will be communicated to suppliers on Lasertel Purchase Orders (POs). If QAPs apply, QAP items will be displayed for each line item on the PO (i.e., QAP 1, 2, 4 will require that the supplier meet QAP 1, QAP 2 and QAP 4.).
- Suppliers must meet all QAPs as specified on the PO. If a Supplier is unable to fulfill all QAPs as defined on the PO, written approval is required from Lasertel.

If the material is purchased through a distributor, the distributor remains responsible for flowing down the requirements to their own suppliers.

REFERENCES

(Use latest revision)

ANSI/ASQC Z1.4-1993	Sampling Procedures and Tables for Inspection by Attributes
ANSI/ASQC Z1.9-1993	Sampling Procedures and Tables for Inspection by Variables
IPC-600	Acceptability of Printed Boards
IPC-610	Acceptability of Electronic Assemblies
IPC/WHMA-A-620	Requirements and Acceptance for Cable and Wire Harness Assemblies
IPC-2221	Generic Standard on Printed Board Design
IPC-2222	Sectional Design Standard for Rigid Organic Printed Boards
IPC-6011	Generic Performance Specification for Printed Boards
IPC-6012A	Qualification and Performance Specification for Rigid Printed Boards
ISO-10012-1	Quality Assurance Requirements for Measuring Equipment
MIL-STD 45662	Calibration System Requirements
88-0119	<i>Cleaning and Deburring of Machined Parts</i>
88-0130	<i>Incoming Inspection of Plated Parts</i>
88-0146	<i>Heat Exchanger Inspection</i>

90-0137

Counterfeit Parts Mitigation – Supplier Requirements

DEFINITIONS

ELECTROSTATIC DISCHARGE	The rapid, spontaneous transfer of electrostatic charge induced by a high electrostatic field.
FIRST ARTICLE INSPECTION REPORT (FAIR)	A report completed by the supplier which conforms to AS9102 (Lasertel document 91-0124).
QUALITY ASSURANCE PROVISIONS (QAPs)	Requirements that are placed on the PO to communicate delivery or performance agreements to be met by the Supplier based on acceptance of the contract.
STATIC SHIELDING	Material having conductive properties that acts as a barrier or Faraday cage to protect items from potential damage due to ESD.
SUPPLIER	Companies with whom Lasertel has contracted with to deliver material for manufacture of products.

QUALITY ASSURANCE PROVISIONS

QAP 1: QUALITY CONTROL

Supplier shall, during performance of this PO, maintain a Quality Control organization and system acceptable to Lasertel. Suppliers are expected to ship product that conforms to the PO issued. Written approval by Lasertel is required prior to shipment of any nonconforming goods. In addition, the Supplier shall include a copy of the deviation documenting the nonconformance with the shipment. Written notification is required within two (2) business days of nonconforming discovery, if found after shipment.

Lasertel may issue a *Supplier Corrective Action Request (SCAR)* and root cause analysis upon receipt of nonconforming material or deviation request. The supplier is expected to complete the SCAR in a timely manner and return completed report to the respective Lasertel Purchasing agent.

Supplier shall notify Lasertel in writing within 10 business days of any major change in the Supplier's Quality Control organization during fulfillment of this PO, or before accepting any

new PO after acceptance onto Lasertel's approved supplier list. This requirement shall be flowed down to sub-tier suppliers used to complete this PO. Written authorization by Lasertel is required before shipment.

Supplier shall notify Lasertel in writing within 10 business days of any changes in process, product, suppliers or facilities, including location changes during fulfillment of this PO, or before accepting any new PO after acceptance onto Lasertel's approved supplier list. This requirement shall be flowed down to sub-tier suppliers used to complete this PO. Written authorization by Lasertel is required before shipment.

QAP 1A: ISO9001 CERTIFICATION

The Supplier shall establish and maintain ISO9001 accreditation from an ANAB-accredited or equivalent body.

QAP 1B: ISO13485 CERTIFICATION

The Supplier shall establish and maintain ISO13485 accreditation from an ANAB-accredited or equivalent body.

QAP 1C: AS9100 CERTIFICATION

The Supplier shall establish and maintain AS9100 accreditation from an ANAB-accredited or equivalent body.

QAP 2: MATERIAL SAFETY DATA SHEET

All products containing hazardous substances must be labeled in compliance with the U.S. Federal Hazardous Substances Act (FHSA) and have the necessary *Material Safety Data Sheet(s)* (MSDSs) included with the shipment.

QAP 3: CERTIFICATE OF CONFORMANCE¹

A *Certificate of Conformance* (C of C) must be included with the shipment specifying that all materials, processes and finished item inspections conform and were controlled in accordance with PO requirements. Records showing these controls shall be on file at the Supplier's facility for seven (7) years.

At a minimum, the C of C shall include the Lasertel part number (P/N), revision (Rev.), PO number, ship date, quantity of items, serial number (SN) and/or lot/batch code, supplier P/N

and Rev. (if applicable) and signature of supplier's authorized representative. Any discrepancy or waiver that applies must be noted on C of C.

QAP 3A: CERTIFICATE OF CONFORMANCE¹

The Supplier shall comply with all of the requirements of **QAP 3** with the exception that the C of C does not require Lasertel P/N, Rev. or SN and/or lot/batch code.

QAP 3B: SPECIAL PROCESS CERTIFICATE OF CONFORMANCE

Supplier must provide a SPC of C with each delivery certifying compliance with all Special Processes required in executing this procurement. The SPC of C must contain the Supplier's / Sub-tier Supplier's name and address, Process completed including revision, Type, Class, Certification number. All applicable certifications are to be attached to the SPC of C.

QAP 4: CONTROL OF RECORDS/DOCUMENTATION

The Supplier shall generate and maintain records and data for all inspections and tests performed. The records and data generated shall be appropriate to the inspection and test operations performed and in sufficient detail to provide for complete verification and evaluation of operations. On request, the records will be supplied to the Purchaser and no records will be destroyed without prior permission of Lasertel. These records may include, but are not limited to:

- Product release certification.
- Records of testing or inspection, such as test certificates, route cards or hatch records that detail product SNs and are required for traceability purposes.
- The Supplier shall retain records for a minimum of seven (7) years unless otherwise agreed in writing by Purchaser. This time period shall be valid from the date of completion of the record.

QAP 5: RIGHT OF ACCESS

Upon the Purchaser providing reasonable notice, the Supplier shall (and procure that its subcontractors shall):

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- Allow the Purchaser and persons authorized by the Purchaser (which may include the Purchaser's customer) access to the Supplier's premises (and those of its sub-tier suppliers) as are being used to carry out work on the goods and services in order to inspect and audit the facilities, processes and procedures used in manufacturing the goods.
 - Provide adequate data to the Purchaser relating to progress of work on the goods and their quality.
 - Provide all necessary assistance (including, where appropriate, access to office, accommodation, telephone and fax facilities, etc.) to enable the rights set out in PO to be exercised fully.

QAP 6: PACKAGING¹

All material shipped to Lasertel is to be packaged in containers that will prevent damage during the shipping and receiving process. To prevent damage related to electrostatic discharge (ESD), ESD-sensitive parts must be packaged using antistatic materials or approved static shielding bag. It is preferred that non-ESD sensitive parts be packaged using antistatic materials where economically feasible. Electronic component and hardware packaging should be sealed or closed in such a way to prevent materials from falling out of packaging.

Materials used for inner packaging (primary packaging material that is in direct contact with the part or is contained inside an outer bag) shall be made from a low-shedding or non-shedding material suitable for use in a Clean Room Environment to help reduce foreign object debris (FOD).

QAP 6A: INDIVIDUAL POLY BAG

Supplier shall comply with all of the requirements of QAP 6 and is also required to place each unit in an individual poly bag to maintain cleanliness.

QAP 7: PACKAGING IDENTIFICATION¹

Supplier shall identify all containers, packing lists and/or certifications with Supplier Name, PO Number, Item/Line Number, Lasertel P/N and Rev., Supplier's P/N and Rev. (if applicable), Lot/Batch Number, Date Code or SN (if required) and any Deviations/Waivers that apply.

QAP 8: INDIVIDUAL PART IDENTIFICATION^{1,2}

Each item is to be individually packaged. Packaging label for each item shall include SN, PO Number, Lasertel P/N and Rev., Supplier's P/N and Rev. (if applicable) and any Deviations/Waivers that apply.

QAP 9: SERIALIZED PART IDENTIFICATION^{1,2}

Items are permitted to be packaged in batches, with a maximum of one (1) lot/batch per package. Packaging label for items shall include S/N(s) or range of S/Ns in package, PO Number, Lasertel P/N and Rev., Supplier's P/N and Rev. (if applicable) and any Deviations/Waivers that apply.

QAP 10: LOT/BATCH PART IDENTIFICATION^{1,2}

Items are to be shipped in batches, with a maximum of one (1) lot per package. Packaging label for items shall include Lot/Batch Number or Date Code in package, Number of Items in Lot/Batch, PO Number, Lasertel P/N and Rev., Supplier's P/N and Rev. (if applicable) and any Deviations/Waivers that apply.

QAP 11: PRINTED CIRCUIT ASSEMBLY/PRINTED CIRCUIT BOARD PACKING¹

Printed Circuit Assemblies (PCAs) / Printed Circuit Boards (PCBs) shall be individually sealed in an antistatic bag to provide electrostatic discharge (ESD) protection and then wrapped or covered with antistatic bubble wrap or foam or placed in an antistatic box.

QAP 12: PCA/PCB DESIGN – IPC STANDARD

PCAs shall conform to the requirements of IPC-2221 and IPC-2222, Class 2; Level C. Acceptance of PCAs shall be per IPC-A-610, Class 2.

PCBs shall conform to the requirements of IPC-2221 and IPC-2222, Class 2, Level C and shall be manufactured in compliance to IPC-6011 and IPC-6012A, Class 2. Acceptance of PCBs shall be per IPC-A-600, Class 2.

QAP 13: CABLE, HARNESSES AND RELATED MATERIAL

Unless otherwise specified by the PO or the Lasertel drawing/specifications, parts shall conform to IPA/WHMA-A-620, Class 2.

QAP 14: FIRST ARTICLE INSPECTION – SUPPLIER¹

First article inspection (FAI) required per AS9102. Supplier shall provide an FAI report using either Lasertel document **91-0124** or a suitable AS9102 format. An FAI report shall be supplied with the initial shipment of a part number or if a part number has not been delivered in the previous 24 months. A delta FAI will be required for:

- A change in a Lasertel P/N Rev.
- Any material, design, tooling and/or process change that affects the original FAI of the product.
- A change in facilities.

QAP 15: SUPPLIER INSPECTION – 100% INSPECTION

Inspection by attributes or variables (conforming to ANSI/ASQC Z1.4-1993 or ANSI/ASQC Z1.9-1993) is required using a sampling plan of 100%. Quality records are to be retained by Supplier and available for review by Lasertel when required. Retention time shall be seven (7) years.

QAP 16: SUPPLIER INSPECTION – AQL 1.0%

Inspection by attributes or variables (conforming to ANSI/ASQC Z1.4-1993 or ANSI/ASQC Z1.9-1993) is required using a sampling plan of AQL 1.0% Level II or an approved alternate. Quality records are to be retained by supplier and available for review by Lasertel when required. Retention time shall be seven (7) years.

QAP 16A: SUPPLIER ALTERNATE INSPECTION — ASQ ZERO ACCEPTANCE NUMBER SAMPLING PLAN

Inspection by ASQ Zero Acceptance Number Sampling Plans, Inspection Level C=0, 1.0 AQL is acceptable as a viable alternative to **QAP 16**.

QAP 17: TEST DATA SHEETS¹

Each shipment shall include an appropriate test data sheet for each part number or lot/batch number as specified on the Lasertel drawing and/or specification. Test data sheets shall reference the Lasertel P/N and Rev. For optically coated P/Ns, witness sample transmission/reflection results shall suffice, unless otherwise specified on Lasertel's specification drawing.

QAP 18: RAW MATERIAL TEST DATA SHEETS¹

Each shipment shall include appropriate test data sheet for each part number, lot number, batch-specific material types or heat-treat, as specified on the Lasertel drawing and/or

specification. Test data sheets shall reference the PO Number, Lasertel P/N and Rev. and Supplier's P/N and Rev. (if applicable).

QAP 19: CONTROL OF SUPPLIERS FOR SPECIAL PROCESSES

Special Processes can include, but are not limited to: Brazing (Vacuum/Dip); Chemical Processes (Including Plating)*; Composites; Heat Treating; Material Testing Laboratories; Non-Destructive Inspection or Testing (NDI/NDT); Protective Coatings (Paint/Epoxy); Welding (Resistance/Fusion) etc.

When a Special Process is identified on a Purchase Order (PO), drawing or other specification; the Special Process shall be performed by a NADCAP / Lasertel Inc. approved source utilizing the appropriate system as agreed upon between Supplier and Lasertel. The source's NADCAP / Lasertel Inc. approval must be current and remain so throughout the fulfillment of the PO.

Sub-Tier Special Process Suppliers: Suppliers using sub-tier Special Process Suppliers shall utilize sub-tier Suppliers that are NADCAP-certified or approved by Lasertel Inc. Should the Supplier's system be approved to control the sub-tier Suppliers, the Supplier shall have records of this approval on file and available for review by the Purchaser's Quality representative(s). Approval of sub-tier Suppliers by the Purchaser does not relieve the Supplier of the responsibility for assuring that work performed by sub-tier Suppliers is in accordance with specification requirements.

*When a Supplier is approved to Chemical Processing by NADCAP, material may be accepted to an identified commercial standard listed in the procurement documents, which may not be listed on the NADCAP-approved list. NADCAP approval for chemical processing shall include applicable military and commercial standards for all types, methods, grades and classes.

QAP 20: MATERIAL TRACEABILITY¹

Goods and services supplied against this PO require full traceability of parts/materials from the time of receipt through delivery of the finished article. Raw material traceability is required to the physical and chemical analysis. If the Supplier is not the original manufacturer of the goods and services, the Supplier shall also provide with the delivery of each consignment, copies of the original manufacturer's *Certificate of Compliance* (C of C) or *Certificate of Conformity* (C of C) together with test results, etc., where applicable.

QAP 21: DEVIATIONS/WAIVERS/CONCESSIONS

All deviations from drawings, specifications, requirements, statements of work (SOWs) or other documents incorporated into the PO by reference are to be referred to the Purchaser's Procurement department for approval and shall be authorized by the Purchaser in the form of an order amendment prior to delivery of the goods and services. Suppliers must demonstrate the requirements for managing product nonconformance's (this includes all hardware and software items where the product item does not conform to the specified requirements) within the business. It is essential that preapproved Deviations/Waivers/Concessions are recorded on all delivery paperwork. Written Deviations/Waivers/Concessions are deemed to be sufficient and formal order amendments, thus obviating unnecessary redrafting of said PO(s). As such, in being order amendments, they are by definition of limited time and/or duration and do not constitute a permanent change to aforementioned drawings, specifications, requirements, SOWs or other documents unless otherwise agreed in writing by Purchaser.

QAP 22: CONFIGURATION CONTROL

The Supplier will establish and control the configuration of their documents such as drawings, specifications, plans and procedures necessary to design, manufacture, test, inspect and deliver goods to the configuration package supplied by the Purchaser. Where the Supplier is designing or supplying systems or subsystems, a configuration management plan may be required by the Purchaser. There shall be no changes or deviations to the contractually agreed Purchaser configuration package without written approval by PO amendment from Purchaser.

QAP 23: CONTROL AND MONITORING OF DEVICES

The Supplier and any sub-tier suppliers shall hold current ISO 9001 certification. Their scope approval shall include calibration capability. Test equipment shall have its performance and calibration verified for all parameters detailed in its manufacture's published performance or calibration specification, against measurement standards traceable to National or International Standards (NIST). At the request of the Purchaser, the Supplier or the Supplier's sub-tier suppliers shall provide calibration certificate(s) and test report(s) showing all test results, including an estimate of the uncertainty of measurement.

QAP 24: FOREIGN OBJECT DAMAGE

The Supplier shall develop and maintain a Foreign Object Debris or Foreign Object Damage (FOD) prevention program for manufacturing areas. The intention is to prevent introduction of foreign objects into any item delivered under this PO. National Aerospace Standard 412 (NAS 412) is available as a guideline.

The Supplier shall employ appropriate housekeeping practices to assure timely removal of residue/debris generated, if any, during manufacturing operations and/or normal daily tasks.

The Supplier's FOD program shall be proportional to the sensitivity of the design of the product(s) to FOD, as well as, to the FOD-generating potential of the manufacturing methods.

QAP 25: RESTRICTION OF HAZARDOUS SUBSTANCES — SOLDER AND COMPONENT FINISHES

Defense equipment Suppliers and customers have major concerns over the reliability of lead-free solder and the risk of "tin-whisker" growth on components with tin-based plated finishes. Most defense equipment is out of scope from the current Restriction of Hazardous Substances (ROHS) and Waste Electrical and Electronic Equipment (WEEE) legislation and, therefore, is not obliged to use lead-free component finishes and solders. Consequently, the Purchaser requires the Supplier to fully comply with specified component finishes and solders. In addition, the Supplier is required to maintain a clear definition and configuration control of the component finishes and solders within products delivered to the Purchaser.

Unless explicitly specified otherwise by either party, the Purchase requires the use, and continuing use, of lead-based solder in all electrical or electronic assemblies.

Components with lead-free finishes may be used. Provided they are compatible with the storage manufacturing and reliability requirements (e.g., NiPdAu finishes are generally acceptable). The Purchaser(s) and customers have reservations on using components with tin-based, plated finishes containing less than 3% lead. Unless explicitly specified otherwise by the Purchaser, the Purchaser requires Suppliers to inform us of the use of components with tin-based, plated finishes containing less than 3% lead in order to assess the "tin-whisker" risk.

QAP 26: RESTRICTION OF HAZARDOUS SUBSTANCES — SOLDER AND COMPONENT FINISHES 2

Lasertel requires all items shipped against this PO to be ROHS-compliant.

QAP 27: INSPECTION CRITERIA OF GOLD METALIZED PURCHASED PARTS¹

Lasertel requires all items shipped against this PO to meet all requirements of Lasertel document **88-0130**. It is the Supplier's responsibility to verify that all items are being inspected to the latest version. The document's latest revision can be obtained from the Lasertel Purchasing department. Supplier shall reference this Document Number and Rev. on the C of C.

QAP 28: INSPECTION CRITERIA OF BRAZED, ANODIZED AND CHROMATED PARTS¹

Lasertel requires all items shipped against this PO to meet all requirements of Lasertel document **88-0146**. It is the Supplier's responsibility to verify that all items are being inspected to the latest version. The document's latest revision can be obtained from the Lasertel Purchasing department. Supplier shall reference this Document Number and Rev. on the C of C.

QAP 29: CLEANING AND DEBURRING OF MACHINED PARTS¹

Lasertel requires all items shipped against this PO to meet, at minimum, Class B for Deburring and Class 1 for Cleaning per Lasertel document **88-0119, SECTION 6 – DEBURRING MAGNIFICATION REQUIREMENTS** and **SECTION 7 – CLEANING**, respectively. It is the Supplier's responsibility to verify that all items are being inspected to the latest version. The document's latest revision can be obtained from the Lasertel Purchasing department. Supplier shall reference this Document Number and Rev. on the C of C.

QAP 29A: CLEANING AND DEBURRING OF MACHINED PARTS¹

Supplier shall comply with all of the requirements of QAP 29 but, at a minimum, meet Class 2 requirements for cleaning.

QAP 30: COUNTERFEIT PARTS MITIGATION

Lasertel requires all items shipped against this PO to meet all requirements of Lasertel document **90-0137**. It is the Supplier's responsibility to verify that all items are being inspected to the latest version. The document's latest revision can be obtained from the Lasertel Purchasing department. Supplier shall reference this Document Number and Rev. on the C of C.

QAP 31: CONFLICT MINERALS

Lasertel requires all items shipped against this PO that contain conflict minerals, said minerals are sourced in accordance with **SECTION 1502** of *The Dodd–Frank Wall Street Reform and Consumer Protection Act*.

Conflict minerals are currently defined to be:

- Gold [Au]
- Tantalum [Ta] (Columbite-Tantalite, Coltan)
- Tin [Sn] (Cassiterite)
- Tungsten [W] (Wolframite, Scheelite, Ferberite, Hübnerite)

Suppliers required to conform with QAP 31 are required to fill out **91-0299 — Conflict Minerals Questionnaire** and return it to Lasertel. Updates are required annually in the fourth quarter.

NOTES

¹ Subject to verification at Lasertel Incoming Inspection.

² Supplier shall be responsible for defining the lot/batch. An individual lot/batch will be determined by the process step with the minimum number of items. Supplier shall furnish lot definition to Lasertel upon request. Items will be inspected at Incoming Inspection on a lot/batch basis.

Revision History			
Revision	C.O.#	Description	Date
A	5058	Initial release.	9/8/2015
B	5946	Update logo; QAP 6 regarding packaging; QAP 24 regarding non-FOD packaging; QAP 29 for min. deburring & cleaning requirements; QAP 31 regarding suppliers filling out 91-0299. Added QAP 29A for separate cleaning requirement.	3/27/2018
C	5989	ADD QAP 3B. Update QAP 19.	4/6/2018
D	6031	Update QAP 19.	5/30/2018
E	6105	Added QAP 6A.	8/24/2018