

1. Purpose and Scope.

The purpose of this document is to define the Quality Assurance Provisions FLIR Systems Inc. requires for inventory material received from Suppliers. This document applies to Purchase Orders and Supply Contracts issued by the FLIR Purchasing Department.

2. Responsibility.

The Supplier is responsible for ensuring conformance to the Quality Assurance Provisions (QAPs) referenced on the Purchase Order. FLIR uses QAPs as part of product acceptance and approval of Suppliers Quality Assurance processes.

The Supplier is responsible for obtaining the current revision of this document. This document may be obtained at <http://www.flir.com/supplier.cfm>

Materials Manager, and VP of Operations or their designees shall approve revisions to this document.

3. Definitions.

Quality Assurance Provisions (QAPs)	Requirements beyond those defined by the drawing and specification(s) that are placed on the Purchase Order (P.O.) to communicate delivery or performance agreements to be met by the Supplier based on acceptance of the contract.
Supplier	Companies with whom FLIR has contracted to deliver material for manufacture of products.
Electrostatic Discharge (ESD)	The rapid, spontaneous transfer of electrostatic charge induced by a high electrostatic field.
Static Shielding	Material having conductive properties that acts as a barrier or Faraday cage to protect items from potential damage due to ESD.

4. Procedure

Quality Assurance Provisions are communicated to Suppliers on FLIR Purchase Orders (P.O.s). If QAPs apply, the QAP numbers will be displayed for each line item on the P.O. These numbers refer to the QAP requirements listed below. Each QAP requirement provides detailed instructions to assist Suppliers with conformance. If the material is purchased through a distributor, the distributor remains responsible for flowing down the requirements to their Suppliers. FLIR reserves the right to waive or amend QAP's and will do so in writing. In the event of any conflicting requirements, the following order of precedence applies:

1. Purchase Order
2. Individual Specification/Drawings
3. Referenced Specification

QAP 1 – QUALITY CONTROL

Supplier shall, during performance of this P.O., maintain a Quality Control organization and system acceptable to FLIR. FLIR, its customers or regulatory authorities governing their business will have right to reasonable access the areas of the Supplier's facilities and documented information throughout the supply chain that pertains to FLIR products. Suppliers are expected to ship product that conforms to the P.O. issued. Written approval by FLIR is required prior to shipment of any non-conforming goods. In addition, the Supplier should include a copy of the deviation documenting the non-conformance with the shipment. Written notification is required within 2 business days of non-conforming discovery, if found after shipment.

QAP 2 – MATERIAL SAFETY DATA SHEET (MSDS)

All products containing hazardous substances must be labeled in compliance with the Federal Hazardous Substance Labeling Act and have the necessary Material Safety Data Sheet included with the shipment.

QAP 3 – PACKAGING

All material shipped to FLIR is to be packaged in containers that will prevent damage during the shipping and receiving process. To prevent damage related to electro-static discharge (ESD), ESD sensitive parts must be packaged using anti-static materials or approved static shielding bag; and, it is preferred that non-ESD sensitive parts be packaged using anti-

static materials. Electronic component and hardware packaging should be sealed or closed in such a way to prevent materials from falling out of packaging.

QAP 4 – LOT/PART IDENTIFICATION

Supplier shall identify all containers, packing lists or certifications with Supplier Name, PO Number, Item Number, FLIR part number/revision, Supplier's part number, lot date code/serial number (if required) and any waivers/deviations that apply.

QAP 5 – PART IDENTIFICATION

If size permits, each individually packaged item is to be labeled with FLIR Part Number and Revision, Supplier part number (if applicable), Supplier I.D., Date Code and Serial Number (if applicable). If deviations or waivers apply, the deviation/wavier number must be marked on the part (if appropriate) or on the item label.

QAP 6 – INSTALLATION KIT PACKAGING

Installation Kits (Cables and Connector Kits shipped with systems) are to be packaged as follows:

- All items within kit are to be placed in a large poly-bag and packed in a double-wall corrugated shipping box.
- Box is to be labeled per IAW MIL-Std-130 including: (Cage code) 64869 ASSY (Part Number) Revision level and description of item as shown on FLIR drawing.
- Shipping container may have small image of Supplier's logo
- Each Installation Kit must have a C of C within the box.

QAP 7 – PRINTED CIRCUIT BOARD ASSEMBLIES (PCBA) PACKAGING

Printed Circuit Board Assemblies (PCBA) shall be individually sealed in a static shielding bag to provide electro-static discharge (ESD) protection and then wrapped in anti-static bubble wrap, or individually placed in an anti-static box with foam.

QAP 8 – PRINTED BOARD AND PCBA DESIGN, IPC STANDARD

Printed circuit board assemblies shall conform to the requirements of IPC-2221 and IPC-2222, Class 2, Level C. Acceptance of assemblies shall be per IPC-A-610, Class 2.

Printed circuit boards 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 boards shall be per IPC-A-600, Class 2.

QAP 9 – CABLE, HARNESES AND RELATED MATERIAL

Unless otherwise specified by the P.O. or the FLIR released specifications, IPC/WHMA-A-620, Class 2 applies.

QAP 10 – FIRST ARTICLE INSPECTION, SUPPLIER AND CHANGE CONTROL

First article inspection required per AS9102. Supplier shall provide First Article report using the AS9102 forms. With FLIR approval, Supplier's own forms are acceptable with AS9102 cover sheet. Supplier is responsible for initiating First Article when there is a change in the design affecting form, fit, or function of the part (including revision change) and when specifically requested by FLIR. Supplier shall notify FLIR when there is a significant change which may affect the product such as:

- A change in manufacturing sources, processes, inspection methods, location of manufacture, tooling or materials that can potentially affect fit, form or function.
- A change in numerical control program or translation to another media that can potentially affect fit, form or function.
- A natural or man-made event, which may adversely affect the manufacturing process.

QAP 11 – SUPPLIER INSPECTION – 100% INSPECTION

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

QAP 12 – SUPPLIER INSPECTION – AQL 1.0%

Inspection by attributes or variables (conforming to ANSI/ASQC Z1.4-Current Revision or ANSI/ASQC Z1.9- Current Revision) 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 FLIR when required. Retention time shall be 7 years.

For Purchase Orders from FLIR Portland only:

Optics material other than coating services and blanks shall include Optical Inspection Form (FLIR form 3203976 or equivalent) with each shipment. Optics materials shall be inspected 100% if required by FLIR specification. Otherwise a sampling plan that produces consistently acceptable material shall be used.

QAP 13 – RAW MATERIAL TEST DATA SHEETS

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 FLIR drawing and/or specification. Test data sheets shall reference the P.O. number, FLIR part number/revision and Suppliers part number\revisions.

QAP 14 – CERTIFICATE OF CONFORMANCE FOR THE FIRST SHIPMENT ONLY OF THE MATERIAL

A Certificate of Conformance (C of C) must be included with only the first shipment of material specifying that all materials, processes and finished item inspections were controlled in accordance with P.O. requirements. Records showing these controls shall be on file at the Supplier's facility for seven (7) years. C of C must be signed or stamped by authorized Supplier representative. **Any discrepancy or waiver that applies must be noted on C of C.** At a minimum, the C of C must include:

- A) Supplier Name
- B) FLIR Purchase Order Number
- C) Part Number and revision
- D) Quantity
- E) Serial number, date code, or lot number as applicable
- F) Supplier Part Number and revision (as applicable)

QAP 15 – CERTIFICATE OF CONFORMANCE FOR EVERY SHIPMENT OF THE MATERIAL

A Certificate of Conformance (C of C) must be included with each shipment of material specifying that all materials, processes and finished item inspections were controlled in accordance with P. O. requirements. Records showing these controls shall be on file at the Supplier's facility for seven (7) years. The C of C must be signed or stamped by authorized Supplier representative. **Any discrepancy or waiver that applies must be noted on C of C.** At a minimum, the C of C must include:

- A) Supplier Name
- B) FLIR Purchase Order Number
- C) Part Number and revision
- D) Quantity
- E) Serial number, date code, or lot number as applicable
- F) Supplier Part Number and revision (as applicable)

QAP 16 – QUALITY MANAGEMENT SYSTEM REQUIREMENT

The Supplier is responsible for implementing and maintaining an acceptable Quality Management System (QMS) such as ISO 9001. The Supplier's QMS must be approved prior to manufacture of purchased product and is subject to review by FLIR at any time. Supplier is responsible for ensuring that sub-tier Suppliers comply with applicable requirements of the PO.

QAP 17 – OPTICAL COATING SCANS

Coating scans for each coating run are required with each shipment of product. Scans must include Supplier's name, FLIR Purchase Order number and run number. Coating scans must be labeled with either reflectance or transmittance as appropriate and scaled in a manner which allows easy verification of conformance to specification.

QAP 18 – WITNESS SAMPLES

Supplier is required to supply witness samples of corresponding material type with each shipment of product. A witness sample must be supplied for each coating run, not each deliverable lot. Witness samples must be identifiable and traceable to each coating run.

QAP 19 – COATING DURABILITY AND/OR ENVIRONMENTAL TEST RESULTS

Durability and/or Environmental Test results are required with each shipment of product. This test may be required for validation only and therefore may be required for first shipment only. This will be specified on the PO.

QAP 20 – TEST REPORTS

Reports with actual test data or indication of pass/fail test results are required with each shipment of product. Test Reports must include the Supplier's name, FLIR Purchase Order number, and date code, lot number or serial numbers as applicable.

QAP 21 – SOURCE INSPECTION

FLIR will perform final inspection and/or witness final inspection the Supplier's facility prior to shipment of product. FLIR will coordinate scheduling of Source inspection with the Supplier in a manner that provides adequate time for on-time delivery of first line item.

QAP 22 – CHANGE CONTROL

Supplier shall notify FLIR through formal notification when there is a significant change which may affect the product form, fit, function, or reliability such as:

- A change in manufacturing sources, processes, inspection methods, location of manufacture, tooling or materials that can potentially affect fit, form or function.
- A change in numerical control program or translation to another media that can potentially affect fit, form or function.
- A natural or man-made event, which may adversely affect the manufacturing process.

QAP 23 – RETURNED MATERIAL (REPAIR, REWORK, REPLACEMENT)

The supplier is required to ensure that any returned material is repaired, reworked, or replaced in conformance with FLIR Specifications. Supplier must meet the following additional requirements:

- Material must be repackaged as new but identified as reworked material.
- Material must be identified with the Return PO Number, Part Number and revision.
- Report must be supplied with material describing the details of work done to repair, rework or replace material. This report must detail the verification of conformance to FLIR specifications.

QAP 24 – RADIOACTIVE MATERIAL IN OPTICS

The supplier is responsible for ensuring that optical elements supplied to FLIR contain **no** thorium or any other added radioactive material.

QAP 25 – PRINTED CIRCUIT ASSEMBLY TEST MARKS

For circuit boards passing an electrical test with a FLIR provided test fixture, the supplier shall mark the edge of the printed circuit card with a 1" long mark using a black indelible marker.

If PCBA is returned to vendor, the vendor should add a 2nd (or 3rd) mark to the edge of the board to indicate the unit has been re-tested.

QAP 26 – COUNTERFEIT PARTS

Supplier shall comply with SAE AS 5553 and AS6174 to prevent and mitigate the use of counterfeit parts for both electrical and non-electrical components supplied to FLIR.

- Only new and authentic materials are to be used in products delivered to FLIR. No counterfeit or suspect counterfeit parts are to be contained within the delivered product. Parts should be purchased directly from the Original Equipment Manufacturer (OEM)/ Original Component Manufacturer (OCM) or through the OCM/OEM franchised distributor/authorized supplier. If Supplier's only source for material is through an unauthorized supplier, Supplier will notify FLIR immediately for approval prior to purchasing any material to support FLIR.
- If suspect/counterfeit parts are furnished to FLIR and are found in any of the goods delivered, such items will be impounded by FLIR. The supplier shall promptly replace such suspect/counterfeit parts with parts acceptable to FLIR.
- All occurrences of suspect counterfeit or counterfeit parts should be immediately reported to FLIR and ERAI (an information service organization that monitors, investigates and reports issues affecting the global supply chain of electronics).
- The supplier shall flow down the applicable requirements of AS5553 and AS6174 to applicable sub-suppliers.



Quality Assurance Provisions

Revision History

Rev	Date	ECO No.	Author	Description of Change
A	7/9/10	26194	R. Tate	Initial Release
B	4/9/12	28809	R. Tate	Add QAP 26
C	9/6/12	29238	R. Tate	QAP11 & 12-noted current Rev for ANSI/ASQC
D	5/10/17	198103	S. Ballard	QPA1-Add inspection language; QAP26-Add AS6174