

APPENDIX 1: QOP-47 Procurement Quality Requirements - QA Clauses/Codes

The requirements listed in Table 1 are minimum requirements per IPC, Mil & J-standard. Details of each requirement follows Table 1. These requirements do not relieve the supplier of their responsibility for furnishing materials and/or services which fully comply with applicable Drawing and defined Specification Requirements – nor does it guarantee acceptance of materials and/or services by Sparton-Milpitas.

TABLE 1

Q-Code	Description	Min.Req'ments for all Direct Goods & Services.	PCB IPC-A 600	PCB IPC-6012, 6018	PCB MIL-PRF-55110 & 31032	Electronic Assemblies (IPC-610/J-STD)	Custom Mechanical	As Req'd
Q1	C of C	X	X	X	X	X	X	
Q2	C of Composition							X
Q3	QMS	X	X	X		X	X	
Q4	Calibration							Med,ITAR
Q5	QPL/QML			X	X			X
Q6	Critical Process							X
Q7	Electrical Test		X	X	X			
Q8	Receiving Insp.	X	X	X	X	X	X	
Q9	Source							X
Q10	Gov. Insp.							X
Q11	Design Control						X	Med,ITAR
Q12	DCN	X	X	X	X	X	X	
Q13	Shelf Life							X
Q14	Test Coupons							X
Q15	FAI		X	X	X			
Q16	ESD					X		
Q17	Audits	X	X	X	X	X		
Q18	SDS (MSDS)							X
Q19	Notifications	X	X	X	X	X		
Q20	Soldering							
Q21	IPC-A-600		X	X	X			
Q22	On Site FAI		X	X	X			X
Q23	X-Section commercial			X				
Q24	X-Section military				X			
Q25	Material Certs			X	X			
Q26	PO Review	X	X	X	X	X		
Q27	ITAR +Q34							ITAR
Q28	Solder Sample(s)		X	X	X			
Q29	Record Retention	X	X	X	X	X	X	
Q30	Workmanship		X	X	X			
Q31	RoHS							RoHS
Q32	Conflict Minerals	X	X	X	X	X	X	
Q33	Counterfeit	X				X	X	
Q34	FAR +Q27			X	X	X	X	ITAR
Q35	Child Labor	X	X	X	X	X	X	
Q36	Ionic			X	X			
Q37	Human Trafficking	X	X	X	X	X	X	
Q38	Authenticity Requirement					X		X

Q39	DFAR + Q34							ITAR
Q40	Prohibition on acquisition from Communist Chinese Military	X	X	X	X	X	X	
Q41	Handling of loaded PCBA					X		X
Q42	PCB Date Code Restriction	X	X	X	X			X

Q1. Certificate of Conformance

A Certificate of Conformance is required with each shipment, and must include each lot or date code. It will certify that the specified quantity of parts or materials, shipped on the date indicated, are in full conformance with all referenced specifications, drawings, and purchase order requirements. Any required test, chemical or physical analysis will be retained by the supplier for three years and will be available for review as required. The certificate must be signed by a responsible company representative. For supplier procured items, the supplier may require that a C of C be provided by the supplier's sub tier suppliers and that the C of Cs will be filed on site by the supplier. Distributors or Brokers must have C of C traceable to the original manufacturer.

Q2. Certificate of Composition

A Certificate of Composition is required. Actual results of physical or chemical tests will be furnished, but may be for a generic or typical batch or lot.

Q3. Quality Management System

The supplies on this order must be controlled under a Quality Control System that is consistent with the requirements of ISO 9001 or equivalent quality system such as AS9100 or ISO13485.

Q4. Calibration System

All equipment delivered against this purchase order shall be fully calibrated, traceable to national standards.

Q5. QPL/QML Qualifications

Parts or materials shall be processed in accordance with Military Specifications or Federal Specifications shown on the purchase order, drawings or specifications, and the material will be certified to be in full conformance with these Government Documents. The manufacturer of this material must be qualified to this specification and listed on the appropriate qualification list.

Q6. Critical Process

The material supplied against this order requires a critical process in its fabrication. Objective evidence of certification of the process and/or operators must be provided to Sparton-Milpitas for inspection as requested. Review of the supplier's process control and manufacturing control documentation may be required before production can begin; items such as travelers, special instructions, other.

Q7. Test Data

Requested test data must be furnished with the material shipped against this order. Test parameters and results must be reported. A Certificate of Test is required.

Q8. Receiving Inspection

Sparton-Milpitas retains the right to inspect/test upon receipt at Sparton-Milpitas materials on this purchase order to verify full conformance to all specified requirements. Failure to meet any specifications may result in immediate rejection and return of the material at the supplier's expense.

Q9. Source inspection

This material shall be inspected/tested by a representative of Sparton-Milpitas at the vendor's facility prior to shipment. Evidence of inspection must be shown by inspector's signature or stamp on shipping documents. Final acceptance is at destination. A minimum of 3-day notice is required prior to shipment. Adequate facilities and personnel will be made available by the vendor to

support this activity. All quality records required to support the source inspection shall be made available to the Sparton-Milpitas QA representative upon request.

Q10. Government Inspection

This material is subject to evaluation by a Government representative prior to shipment. Upon receipt of this order, promptly notify the Government representative, who normally services your plant, so that appropriate planning for Government inspection can be accomplished. If the supplier has difficulty in locating a Government representative, Sparton-Milpitas Purchasing Department will provide assistance. Shipping papers for each lot shipped must bear evidence of Government surveillance in the form of authorized Government Quality Assurance Representative's signature and/or stamp.

Q11. Seller's Design Control

When design is the seller's responsibility, the seller shall not, without prior approval of Sparton-Milpitas, make any change in materials or design details that would affect: part number identification.

Q12. Design Change Notification

When the seller is manufacturing to Sparton-Milpitas design, no departure from the drawing and/or specification shall be made unless specifically authorized in writing by Sparton-Milpitas.

Q13. Shelf Life/ Hazardous Material

The material on this order is considered to have a limited shelf life, and must be so identified. Each container must bear a mix, batch, or cure date, and a 'not to be used after' date. All storage condition limitations must be clearly detailed on each label. At the date of receipt by Sparton-Milpitas, at least 75% of such designated use life must still be remaining, or the material may be returned for replacement.

Q14. Test Coupons

Test specimens or coupons, as required by controlling specification, drawing, or purchase order notes, must be included in each shipment against this order.

- IPC coupons per IPC-2221
- TDR coupons per IPC-2221 and per Impedance Values required.

Q15. First Article

Product shipped to Sparton-Milpitas will include a "First Article Inspection Report" submitted by the supplier, for each lot/date code. Standard First Article Reports may be on the customer's format or supplier's format. If a specific report is required it will be clearly specified on the purchase order.

First Article Report will include at a minimum the following: Part number, revision level, purchase order number, lot and/or date code, quantity per lot/date code, Accept or Reject, Inspector Name or stamp.

The following are additional requirements for Printed Circuit Boards:

- Serial numbers shipped (if applicable).
- Specify which IPC or Mil spec certification, the product is certified to.
- All dimensions/hole sizes and tolerances on drawings, specifications and any applicable data.
- Material call out, type, overall thickness.
- Plating finish, Solder Mask and Silkscreen type and color.
- Bow & Twist

The following are additional requirements for mechanical parts (sheet metal, machine parts, etc.):

- Raw Material Certifications (i.e., .062 Thick Aluminum Alloy 5052 per QQ-A-250/8).
- Special Process Certifications (i.e., finish to Chemical Film per Mil-C-55541, Class 1A)
- Each drawing note clearly listed in the report and validated.
- Each drawing dimension or feature that is called out in the Sparton-Milpitas Engineering drawing listed and the actual measurement documented.

For procured assemblies (PCAs, Cable Assemblies, etc.), all of the items listed above for mechanical parts shall apply with the exception of the raw material certifications and the special process certifications. In addition, BOM requirements will need to be added as checklist items on the FAI Report. The BOM item verification needs to list each item on the Sparton-Milpitas BOM, the MCN, the Manufacturer part number (if applicable), the quantity per, and accept or reject status next to each item.

In addition, test data sheets shall be provided for any in-process testing or inspection performed (i.e., AOI, Flying Probe, Bed of Nails, ICT, functional test, continuity or any other electrical test) X-ray films for all BGAs on the PCA(s) used for FAI shall be required.

Q16. ESD Controls

The product must be handled and packaged in the best commercial fashion for Electrostatic Discharge (ESD) protection. Acceptable packages will include static dissipative bags, foils bags, conductive foam, foil impregnated bags, static dissipative tubes, etc. No clear untreated plastic or white foam packaging will be allowed. The materials will be packaged, handled and stored in conditions compliant to ANSI/ESD S20.20, MIL-STD-1686 and DOD-HDBK-263. The classification of materials for susceptibility to electrostatic discharge will be by the aforementioned specifications.

Q17. Vendor and Sub Tier Audits

Sparton-Milpitas may elect to verify the quality of work and materials at the vendor's facility or at the vendor's sub tier suppliers at any production stage for materials intended for incorporation into Sparton-Milpitas products. Such sub tier verification may be requested through Sparton-Milpitas Quality Assurance and may be performed jointly with the vendor. Quality records in support of the audit shall be made available to Sparton-Milpitas upon request.

Q18. Safety Data Sheet (SDS) - Replaces MSDS

One copy of the applicable Safety Data Sheet (SDS) is required with each shipment of the product referenced on this purchase contract. Supplier shall ensure that the name and/or item number of the product as identified on the SDS is identical to the name and/or item number which appears on this purchase contract.

Q19. Supplier Notifications

Supplier is required to:

- Notify, in writing, Sparton-Milpitas of any nonconforming product subsequent to shipment to Sparton-Milpitas within 24 hours; and shall not ship product without first obtaining approval from Sparton-Milpitas of nonconforming product.
- Notify, in writing, Sparton-Milpitas any changes to product or process definition and shall obtain written approval by Sparton-Milpitas prior to shipment.
- Notify Sparton-Milpitas of any change in facility locations or major process equipment used on Sparton-Milpitas products.

- Provide applicable flow down requirements to sub-tier suppliers in their purchasing documents including key characteristics, where and as required.
- Immediately contain affected nonconforming product when notified by Sparton-Milpitas.
- Respond to corrective actions if the supplier is found to be responsible for nonconformities. Timely and effective corrective actions will be reviewed and approved by Sparton-Milpitas quality.

Q20. SOLDERING (HIGH QUALITY / HIGH RELIABILITY)

All products supplied under this contract shall be assembled, soldered and inspected utilizing Institute for Interconnecting and Packaging Electronics Circuits (IPC) Standards as follows:

- IPC-T-50 Terms and Definitions for Interconnecting and Packaging Electronic Circuits.
- IPC-A-610 Acceptability of Electronic Assemblies, Class 2 or 3, or as required on the drawing or referenced specification(s).

Q21. PRINTED WIRING BOARD CONDITION

All products supplied under this contract shall be manufactured, soldered and inspected utilizing Institute for Interconnecting and Packaging Electronics Circuits (IPC) Standards as follows:

- ANSI/IPC-A-600 Acceptability of Printed Boards Class 2 or 3 as required on the drawing or referenced specification(s). If not specified, then Class 2 is the default, (Class 1 will not be accepted).

Q22. On Site FAI at the Supplier's Facility

Sparton-Milpitas Quality Assurance retains the right to conduct/witness an onsite FAI at the supplier's facility. This can be done during any type of FAI (first production run, change in the design, etc.) and should be pre-coordinated with the Sparton-Milpitas buyer and the supplier's Quality representative.

Q23. Cross Section/Micro Section Report

Cross section/micro-section report must be sent with the product to Sparton-Milpitas in accordance with IPC-6012 or applicable IPC standard.

Q24. Cross Section/Micro-section Report

Cross section/micro-section report must be sent with the product to Sparton-Milpitas in accordance with MIL-PRF-55110 and/or MIL-PRF-31032.

Q25. Material Certifications

Material certificates of conformance must be supplied with the product to Sparton-Milpitas. Materials include any material supplied by the vendor to produce the product. The material certs must be from the procuring supplier, and for each lot/datecode.

Q26. Vendor Purchase Order Review:

It is the vendor's responsibility to advise Sparton-Milpitas if any data received from Sparton-Milpitas does not meet the requirements of the Purchase Order, Drawings, Bills-of-Material, Specifications, or other requirements. The vendor must request permission to deviate from Sparton-Milpitas requirements. Exceptions specified on supplier quotes shall not be "assumed" as approved simply because the pricing on the Purchase Order was identical to the quote.

Q27. ITAR Controlled Materials or Technical Data (International Traffic and Arms Regulations):

The materials or Technical Data delivered with the purchase order are ITAR controlled. Persons viewing or working on these ITAR materials or technical data must **not** have a national origin other than from the United States unless the person has obtained a United States 'Green' card, is a

naturalized U.S. citizen, or is identified on the U.S. State Department ITAR license associated with the purchase order as authorized to view and work on the materials and/or technical data.

- Q28. **Solder Samples:** Fabrication (bare board) vendors will provide two solder samples with each order. Solder Samples must be a sample of finished product, but may be non-functional boards and must be clearly marked as solder samples. Solder Samples must be whole (not a cut corner of the board, and cannot be solder. The purpose of the solder sample is to confirm Sparton's profile and tooling before our production.
- Q29. **Quality Records Identification and Retention:**
Subcontractors that modify/add value to Sparton-Milpitas product must identify and keep quality records in accordance with ISO 9001. Minimum retention of quality records is ten years. The vendor must contact Sparton-Milpitas when quality records are to be destroyed. Sparton-Milpitas will verify that the retention period has been accomplished. Sparton-Milpitas may want to receive and archive the quality records at Sparton-Milpitas for a longer period of time.
- Q30. **Workmanship Requirements:**
a. Workmanship must conform to IPC-A-600
b. Workmanship must conform to IPC-A-610
c. Workmanship must conform to IPC-CC-830
d. Workmanship must conform to IPC-HDBK-830
e. Workmanship must conform to IPC-6012, IPC-6012 or IPC-6018
f. Workmanship must conform to IPC-7711/21
g. Workmanship must conform to J-STD-001
h. Workmanship must conform to Mil-Prf-55110 / Mil-Prf-31032
i. Workmanship must conform to NASA-STD-8739
- Q31. **RoHS requirements:**
The materials delivered must be RoHS Compliant and be stated as such on the C of C.
- Q32. **Conflict Minerals:**
Supplied materials must comply with Section 1502 of the Dodd-Frank reform law. Sparton-Milpitas may require a completed Conflict Minerals Report, using the reporting Template of its choice.
- Q33. **Counterfeit parts detection and management:**
Supplied parts shall not be counterfeit. Parts shall have been produced by original manufacturers and shall not have been re-labeled. Vendor is responsible for detecting, quarantining, and/or destroying counterfeit parts as specified in IDEA-STD-1010, including but not limited to, contacting GIDEP as/when needed. Sparton-Milpitas shall take all necessary steps, including but not limited to, quarantining and destroying counterfeit parts.
- Q34. **FAR Compliance:**
Persons and companies selling materials or services to Sparton-Milpitas, www.sparton.com, must comply with the USA Federal Acquisition Regulation (FAR).
- Q35. **Child Labor:**
Persons and companies selling materials or services to Sparton-Milpitas, www.sparton.com, must be able to show that child labor laws such as the USA Fair Labor Standards Act are being adhered to. Children under the age of 16 cannot be required to work except for very few exceptions as defined in the Fair Labor Standards Act.

- Q36. **IONIC CONTAMINATION:** (for Printed Circuit Boards Only)
Ionic Contamination (Cleanliness Report) before soldermask is required for each lot/date code.
- Q37. **Human Trafficking & Slavery:**
Persons and companies selling materials or services to Sparton-Milpitas, must comply with the California Transparency in Supply Chains Act, which was signed into law October 2010 and went into effect in January 2012.
- Q38 **Authenticity Requirement:**
Sparton Suppliers shall not obtain materials from Independent Distributors without prior approval from Sparton, with the exception of Independent Distributors who are currently on the approved suppliers list (ASL).
- Q39 **DFAR Compliance:**
Persons and companies selling materials or services to Sparton-Milpitas, www.sparton.com, must comply with the Defense Federal Acquisition Regulation Supplement (DFARS).
- Q40. **Prohibition on acquisition from Communist Chinese Military:**
Sparton Suppliers shall not obtain materials from companies which are owned, controlled or affiliated with any part of the commercial or defense industrial base of the People's Republic of China (China).
- Q41. **Handling of loaded PCBA:**
Special care is to be taken when handling loaded PCBA. Handle board by the edges, avoid touching components on the board. Do not introduce the PCBA to any shock, abrasion or excess heat. Humidity shall be kept between 30% - 70% unless otherwise approved by Sparton. Q16 for ESD handling and packaging applies to Q41.
- Q42. Two year date code restriction for Printed Circuit Boards, from date of manufacture.