

Quality Clauses

CLAUSE S-1 QUALITY PROGRAM REQUIREMENT

All goods shall be manufactured in accordance with the latest version of quality system ISO 9001 or equivalent.

CALIBRATION SYSTEM REQUIREMENTS

Suppliers performing measurements for the acceptance of production material for delivery to CMC shall be using a calibration system meeting the requirements of ISO 10012, MIL-C-45662 or equivalent.

AUTHENTICITY REQUIREMENT

Only new and authentic materials are to be used in products delivered to CMC Electronics. No counterfeit or suspect counterfeit parts or materials are to be contained within the delivered product. Parts or raw material shall be traceable to the applicable original manufacturer.

An effective process must be maintained to ensure the delivery of authentic and conforming material. The seller shall ensure material traceability back to its manufacturer. That method shall clearly identify the name and location of all the supply chain intermediates.

When accepting an order, the vendor acknowledge that he is either the original manufacturer of the parts or an authorized/franchised distributor. Distributors that are not authorized or franchised by the original manufacturer to sell a component have the obligation to disclose it to the CMC buyer before accepting the order.

NOTIFICATION REQUIREMENT

Supplier shall notify CMC of nonconforming product and obtain CMC approval for nonconforming product disposition prior to or post shipment.

DROP SHIPMENT

In the event that goods are delivered to a consignee other than CMC, the 'Drop Shipment Supplier Inspection Checklist' # 9504-0630 form must be duly filled out by the vendor and returned to the CMC buyer prior to CMC'S final acceptance of the goods. This form is available on <https://extraweb.cmcect.ca/procurement>.

CLAUSE S-2 TEST AND INSPECTION DATA

(a) Seller shall supply with each shipment and maintain on file for a period of ten (10) years minimum, the test and inspection data as required by the applicable specification. All data shall be traceable to specific items or lots. The data shall indicate approval by an authorized representative of the Seller's Quality Assurance organization. Test and inspection data sheets in conformance with the provisions of the applicable specification shall include:

- i) Order Number.
- ii) Part number, revision level of the part, serial number (if applicable) and
- iii) Specification number and revision level, which specifies test requirements.

- (b) Seller shall ensure that all test and inspection data as required by the applicable specification is on file, available for examination by the Buyer and retained for a period of ten (10) years minimum following delivery of goods. All data shall be traceable to specific items or lots.

The data shall indicate approval by an authorized representative of the Seller's Quality Assurance organization. Test/Inspection data sheets in conformance with the provisions of the applicable specification shall include:

- i) Order Number.
- ii) Part number, revision level of the part, serial number (if applicable) and
- iii) Specification number and revision level, which specifies test requirements.

CLAUSE S-3 FIRST ARTICLE INSPECTION (FAI)

FAI reports are required for production and preproduction parts. FAI's are not required for prototypes. You must use the revision of the part number to distinguish prototypes and production. For prototypes, revisions are indicated by numbers such as (0, 01, 02...) and for production revisions are indicated as letters (-, A, B...). Revision information is found on the purchase order.

The FAI shall be covering all appropriate physical and functional characteristics of the part or assembly, workmanship and the completeness and correctness of the required documentation in accordance with applicable drawings and specifications.

FAI is required when the purchased product:

- Is manufactured by a new supplier or new manufacturing location;
- Is a new part, or purchased for the first time;
- Has a new revision (Refer to the new revision section below);
- Wasn't manufactured during the last 24 months by the supplier

The manufacturer of the part will measure and record all features using AS9102 form or any other template as long as equivalent information can be found. Dimensions has to be compared with the same dimension (including tolerances) extracted either from the drawing or the CAD file to confirm that the part manufactured meet CMC's requirement. Applicable requirements from the note table and part list shall also be verified.

Documentation provided by the supplier shall include, when applicable:

- Data report sheet (mechanical, electrical and electro-mechanical parameters)
- Print out of CMM report
- Test data sheet (ATP, etc.)
- For Printed Circuit Boards, all items specified in clause S-35a
- Any relevant certificate related to:
 - Raw Material
 - Hardware
 - Plating or surface treatment
 - Painting (primer, paint, ink, etc.)
 - Chemical Product (epoxy, hardener, glue, resin, etc.)

The documented evidence linked with the items inspected or tested must be included with the shipment and maintained on file for a period of ten (10) years minimum.

Following successful completion of the FAI, any change to the Goods or processes shall be submitted to the Buyer for approval prior to implementation.

Revision Change

In case of a revision change, a partial FAI report focusing only on the modified characteristics between the old and the new revision is deemed acceptable. Relevant certificates should be included with the partial FAI report submission whenever they are linked with the change.

When the drawing revision change does not involve any change to the performance or physical product itself, no FAI report is required.

CLAUSE S-4 SAMPLES FOR APPROVAL

Seller shall await Buyer's approval of pre-production sample(s) before proceeding with production quantities. Samples must be properly identified when shipped to Buyer and copies of actual test and inspection results including radiographs, physical and chemical analysis, where applicable, shall accompany the shipment.

CLAUSE S-5 CHANGE CONTROL SYSTEM

- (a) Seller shall develop and maintain a written Change Control System that will ensure the following:
 - i) Changes are properly evaluated, classified and documented
 - ii) Changes are recorded and incorporated at the specified effectivity point; and
 - iii) Control of the physical and functional interfaces of support equipment and supporting documentation.
- (b) The Seller's Change Control system shall be submitted to Buyer for approval within thirty (30) days after receipt of Order.
- (c) The Seller shall inform CMC before implementing any change such as; any change that could affect product fit form or function, raw material, supplier of key material or critical process, equipment that could affect process outputs, ERP or MRP change, relocation of manufacturing facility, outsourcing of key operations.

CLAUSE S-6 CERTIFICATE OF COMPLIANCE

Shipments made against this order must contain a Certificate of Compliance attesting that all specifications, drawings and Order requirements have been met. Seller must maintain Quality records applicable to the Certificate for a minimum period of ten (10) years.

The Certificate of Compliance must contain as a minimum, CMC Order number, CMC part number and revision, serial number (if applicable) and quantity shipped.

In the case that CMC reference information (order number, part numbers and revision) cannot be added on the Certificate of Compliance, the supplier must provide documentation that links the product shipped to the CMC reference information. This is to ensure traceability of the Certificate of Compliance provided to CMC's reference information.

CLAUSE S-7 SHELF-LIFE INFORMATION

Each shipment made against this Order shall be accompanied by full details relative to the shelf-life limitations, date of manufacture, expiry date and recommended storage conditions for the Goods. Buyer must be advised in case of any change relative to the shelf-life limitation.

Goods, which have less than the percentage specified below of their shelf life remaining upon reception will be subject to rejection.

- (a) 80%
- (b) 50%

CLAUSE S-8 Abrogated

CLAUSE S-9 Abrogated

CLAUSE S-10 CERTIFICATION OF SOURCE

Seller shall include with each shipment, a Certification of Conformance from the manufacturer. The certificate should indicate the name of the manufacturer, order number, part number, lot number and quantity. Seller shall maintain on file for a minimum of ten (10) years, a Certificate of Conformance from the manufacturer on this order.

CLAUSE S-11 SERIALIZATION AND LOT CONTROL

- (a) The Goods shall be identified with a serial number, traceable to its production lot records.
- (b) The Goods shall be marked with a manufacturer's date code, traceable to its production lot records. If it is not practical to mark the Goods, the lowest order of packaging shall be marked with the date code.
- (c) Certificate of Traceability is required and shall be packed with the Goods.

CLAUSE S-12 PRIORITY ASSISTANCE (FOR CANADIAN SUPPLIERS)

This is an urgent defense requirement. If the seller is importing any material/service from the U.S.A. for the fulfillment of this Contract, contact the Central Allocations and Defense Priorities Officer, Department of Public Works and Government Services, Ottawa, Ontario K1A 0S5, to request a U.S. Priority Rating.

CLAUSE S-13 DEFENCE PRIORITY AND ALLOCATION REQUIREMENTS (FOR U.S. SUPPLIERS)

This is a rated Order certified for National Defense use and the supplier shall follow all the requirements of the Defense Priorities and Allocations System regulation (15CFR 700). Rating: DO-D1.

CLAUSE S-14 GUARANTEE OF SUPPLY

Seller guarantees that it will make available to Buyer a supply of spares to support the Goods for a period of twenty (20) years from the date of delivery of the Goods. In the event that the Seller or its successors or its assigns are unable to supply hardware and/or software to support the Goods, Seller or its successors or its assigns will enter into a know-how transfer agreement which will allow Buyer the right to reproduce, use and disclose proprietary information used by Seller to build, maintain or service the Goods.

CLAUSE S-15 Abrogated

CLAUSE S-16 Abrogated

CLAUSE S-17 COMPLIANCE WITH REQUIREMENTS

By acceptance of this order, Seller accepts responsibility for full compliance with all requirements. Seller will maintain on file for a minimum of ten (10) years chemical and physical test reports, inspection and test reports, and/or any other suitable verifiable objective evidence of quality further declares that each shipment against this Order is a certification of the above requirements.

Certificate of Compliance or evidence of compliance with requirements must be submitted to be buyer within 48 hours when requested by a CMC representative.

CLAUSE S-18 GOVERNMENT QUALITY ASSURANCE

Government Quality Assurance at source is required. Upon receipt of this purchase order, promptly notify the Government Representative who normally services your plant so that appropriate planning for Government Quality Assurance can be accomplished.

In the Event that the Government Representative or delegated agency cannot be located, Buyer shall be notified immediately.

CLAUSE S-19 Abrogated

CLAUSE S-20 Abrogated

CLAUSE S-21 Abrogated

CLAUSE S-22 CHEMICAL FILM

Seller is authorized to perform the Chemical Film process as per the table below:

From original specification called on CMC Drawing	To new specification
Chemical film per MIL-C-5541 class 1A Chemical film per MIL-C-5541 class 1A yellow	Chemical film per MIL-DTL-5541, Type 1, class 1A, yellow or type II, class 1A (Rohs)**
Chemical film per MIL-C-5541 class 1A clear	Chemical film per MIL-DTL-5541, Type 1, class 1A, clear or type II, class 1A (Rohs)
Chemical film per MIL-C-5541 class 3 Chemical film per MIL-C-5541 class 3 yellow	Chemical film per MIL-DTL-5541, Type 1, class 3, yellow or type II, class 3 (Rohs)**
Chemical film per MIL-C-5541 class 3 clear	Chemical film per MIL-DTL-5541, Type 1, class 3, clear or type II, class 3 (Rohs)

Formal CMC Document 4050-1023 has been released June 4, 2008 to document this change.

If applicable, as per drawing.

Seller shall include with each shipment, a certification that indicate the name of the processing source, information about the chemical film process used, the current P.O. number, CMC part number and quantity. The Seller shall maintain on file for a minimum of ten (10) years the Certificate of Conformance from the sub-contracted process.

****EXCEPTION**

This process substitution is not authorized on CMC Drawing XXX-96XXXX-XXX from Panel Shop Group. Yellow chemical film cannot be substituted by RoHs equivalent for optical reasons (intensity, color, transmission & reflection parameters).

CLAUSE S-23 AUTHORIZED RELEASE CERTIFICATE

Shipments made against this order must contain an Authorized Release Certificate.

Document title by country:

From Canada: Form One (This title replaces the previous designation 24-0078)

From USA: FAA Form 8130-3

From European countries member of EASA: EASA Form

CLAUSE S-24 Abrogated

CLAUSE S-25 ESD

Electrostatic sensitive devices must be processed, protected and identified in accordance with the ANSI/ESD S20.20 or with the MIL-STD-1686.

CLAUSE S- 26 SOLDERING REQUIREMENTS

Soldered electrical and electronics assemblies shall meet the requirements of J-STD-001, class 3.

Class 3 requirement might be revalued based on:

- Availability of MTBF data
 - o Product functionality
 - o Risk assessment
- Evidence that the product is formally certified by a Civil Aviation Agency.
 - o Nevertheless, Class 2 requirement is the minimal acceptance level.

CLAUSE S- 27 SOURCE INSPECTION

CMC Electronics Inc., third-party source representatives, or customers (when authorized by CMC Electronics Inc.) reserve the right to inspect, re-inspect, test or retest, or witness any inspection or test at the Supplier's facility at any level of manufacture and software development, up to and including completed items, using the Supplier's equipment. All such visits will be coordinated in advance. These visits will be with Supplier's escort and with prior approval.

When Source Inspection is contractually imposed, unless otherwise mutually agreed, CMC Electronics Inc. must be advised a minimum of ten (10) working days in advance of the requirement. Prior the visit, the Supplier will perform inspections or tests as deemed necessary to ensure conformance of the product to requirements. All documented evidence or assurance, traceable to the item (s) or product (s) inspected or tested must be made available for review to the CMC Electronics source inspector. The documentation of the results must include:

- The purchase order;
- The CMC Electronics part number, revision level, serial numbers (if applicable);
- Specification number and revision level of the test document;
- Compliance with drawings, specification and other approved documentation;
- Objective evidence of Inspection and Acceptance of Tooling and Test Equipment used;
- Objective evidence of Seller's Inspection and Acceptance of the FAI at each of the inspection points designated in the Quality plan;
- Any other evidence of conformance as required by this Order;

The Supplier shall retain for a minimum of ten (10) years following delivery the documented evidence specified herein.

Source Inspection in no way relieves the Supplier of the responsibility for supplying a product that fully complies with the contract.

CMC Electronics reserves the right to assign Quality Assurance personnel to the Supplier's facility. The Supplier will be required to support such assigned personnel from CMC Electronics with adequate facilities and equipment and must designate one responsible individuals with whom the CMC Electronics representative may discuss any questions concerning manufacture, software development, inspection, or test of the product on order.

CLAUSE S-28 ENVIRONMENTAL AND SOLDERING ALLOY

AUTHORIZED ALLOY FOR COMPONENT TERMINATION

All components manufactured for CMC Electronics must meet all requirements called on the drawing or used the information below as guidelines (if the drawing doesn't call for a specific solder alloy) during the soldering process:

Component type	Authorized alloy
SMT and PTH	Sn/Pb, Pure Tin, Ni-Au, Ni-Pd-Au, SAC, Ag, Ag-Pd, Sn-Ag
BGA	Sn/Pb
Internal leads	Sn/Pb

For all other alloys Supplier must get Authorization from CMC quality group at moment purchase order is placed.

ENVIRONMENTAL

Supplier must meet all applicable environmental laws and regulations. This includes all applicable provincial, state, federal or other laws. In addition, the supplier must comply with REACH regulations. REACH is the European Union regulation on chemicals and their safe use. The supplier must notify CMC Electronics if a component, sub-assembly or final assembly contains one or more REACH Substances of Very High Concern (SVHC) in excess of 0.1% by weight. The notification must be made prior to accepting the order from CMC. The list of substances is updated every 6 months and is maintained current by the European Chemicals Agency (ECHA). For more information please refer to the ECHA web site located at http://ec.europa.eu/echa/reach_en.html and Look for the Candidate List of Substances of Very High Concern.

CLAUSE S-29 PREFERENCE FOR DOMESTIC SPECIALTY METALS

Seller shall ensure that the raw material used to manufacture detailed components, and/or subassemblies is acquired from a United States foundry or Qualifying country.

Specialty Metals definition is according to paragraph 252.225-7008 and 252.225-7009. See link:

<http://www.acq.osd.mil/dpap/dars/dfars/changenotice/2012/20121116/dfars-changes-20121116.pdf>

Qualifying country means any country listed in the DFARS 225.872-1. See link:

http://www.acq.osd.mil/dpap/dars/pgi/frameset.htm?dfarsno=225_8&pgino=PGI225_8&dfarsanchor=225.872-4&pgianchor=225.872-4

CLAUSE S-30 CABLE AND WIRE HARNESS

Cable and wire harness assemblies to be done in accordance with the standard IPC/WHMA-A-620 class III.

Hot stamp marking process on wire and cable is proscribed.

CLAUSE S-31 COUNTERFEIT AVOIDANCE TESTING REQUIRED

Parts are to be sent out to a CMC approved laboratory for fraudulent/counterfeit detection. Suspicious results must be flagged to the buyer in order to obtain the approval of the SMQA representative prior to shipment. Test reports should always be provided with shipment.

For Electronic parts: Inspection and tests to be done as per the requirements of AS6081. Sampling plans shall be in accordance with AS6081 table 1. The tests below shall be performed and depending on the situation, specific tests may be added to the purchase order.

- Documentation and Packaging inspection
- External visual inspection
- Inspection for Evidence of Remarking or Resurfacing (destructive)
- Radiological (X-Ray) inspection
- Lead finish evaluation
- Delid/decapsulation internal analysis and die identification (destructive)
- Electrical Testing

For Non electronic parts: All required tests to ensure proper material composition are to be performed as per AS6174. In addition, specific tests may be added to the purchase order as required.

CLAUSE S-32 Reserved

CLAUSE S-33 DATE CODE LESS THAN 8 YEARS

Date code must be less than 8 years at time of reception. If parts are older than eight years, seller must perform a solderability test according to EIA/IPC/JEDEC J-STD-002 and provide the results to buyer for approval.

Any component with an unknown Date code or lot traceability shall be tested according to the counterfeit detection program as specified in Quality Clause S-31.

Seller shall not ship the material until written approval from the buyer is received.

CLAUSE S-34 ETCH BACK REQUIREMENT

Seller is authorized to perform a smear removal (flush) or negative etch back as per IPC-6012 Class 3 instead of "positive" etch back of 0.0002 inch minimum and 0.0015 maximum as per IPC-6012 called on CMC PWB drawing as standard manufacturing requirement.

Formal CMC Document 4050-1022 has been released June 4, 2008 to document this change.

CLAUSE S-35 PRINTED WIRING BOARD PACKAGE REQUIREMENTS

Seller shall include with each shipment, all pertinent documents/material listed below:

- Certificate of Compliance should be signed by an authorized Quality Assurance/Control representative and must contain as a minimum:
 - Date, CMC Part Number, Revision level, Purchase Order number, Item number, Quantity, Raw material type (Laminate & Prepreg, including expiration date), IPC specification & Class, Solder mask type and trademark, Parameters of electrical test performed, Subcontract processes/Outside source
- Technical information, Data sheet of all IPC requirements and parameters tested, evidence of acceptance, Matrix sheet of bare boards shipped versus panel and number.
- Evidence of electrical test has been performed (Stamp or mark)

Seller shall maintain on file for a minimum of ten (10) years, the Certificate of Conformance from its supplier for the Goods on this Order.

(a) On top of the items mentioned above, the Seller shall also include with each shipment, the pertinent documents/material listed below:

- Test coupons
 - All IPC & IST test coupons (coupons A & B) manufactured per panel, including IST test report performed (internally or subcontracted)
- Micro sections
 - All physical micro sections performed according to IPC requirements (In process & final → AS-IS & Stressed)
 - Quantity of micro section as per Tables 4-2 & 4-3 of IPC-6012 and 6013 and Table C-1 of MIL-PRF-55110 and MIL-P-50884
- Raw board used to do the solderability test

(b) Except for a First Article Inspection part delivery (reference clause S-3, where all evidences are required to be shipped), Seller shall retain test coupons, micro sections and boards used to perform solderability test at their facility for a minimum of ten (10) years and will ship them to the buyer within 48 hours upon request.

CLAUSE S-36 FOD PREVENTION PROGRAM

Seller shall have in place a FOD (*Foreign Object Debris / **Foreign object Damage) Program to prevent and eliminate potential damage to any CMC equipment or component manufactured and/or might have an impact on production delay.

The FOD Program shall establish general practices and guidelines to reduce the risk of having Foreign Objects part of the designed, developed, manufactured and assembled processes.

*Foreign Object Debris: is any object, article, substance, debris or agent that is not where it is supposed to be that may create a hazard to an equipment or component.

**Foreign Object Damage: is damage caused by Foreign Object Debris that compromised the Quality, functionality or economic value of a manufactured item.