



Procurement Quality Controls

Purchase Order Attachment I

QC100 – QUALITY MANAGEMENT SYSTEM

The seller shall maintain a Quality Management System that complies with the requirements of ISO 9001 or a Quality Management System approved by OPDT (OnPoint Defense Technologies). Suppliers that are certified by ISO/ANAB/OASIS/IAQG via accredited Certifying Bodies and Registrars are preferred.

QC101 – IDENTIFICATION, PRESERVATION, PACKAGING, AND PACKING

All shipments to OPDT must be packaged to avoid damage and deterioration and must be shipped to the address specified on the PO unless otherwise noted. Packaging and packing shall be in accordance with good commercial practices unless otherwise specified on the PO. Parts shall not be intermingled unless otherwise specified. Each box or container shall be labeled and have as a minimum the following information: (1) Part number and revision, (2) PO number, (3) PO Line Item, (4) Quantity and (5) Manufacturer's identification.

QC102 - SOURCE OF SUPPLY

Suppliers are responsible to ensure compliance for materials used to manufacture parts supplied to OPDT. Suppliers will only purchase materials from Original Equipment Manufacturers (OEM's), Original Component Manufacturers (OCM's), standard catalogues, or the OEM/OCM authorized franchised distributors. Purchasing from independent brokers or other sources is not authorized unless approved in writing by OPDT.

Suppliers of electronic components will have an established counterfeit avoidance program. That program will include a process for component authentication/testing with verified traceability to the OCM. Supplier programs that are not certified to CCAP 101 or audited to SAE AS5553 will be approved in writing by OPDT prior to providing electronic components or production assemblies with electronic components.

QC103 – MEASURING & TEST EQUIPMENT

It is the seller's responsibility to ensure all equipment, including Customer Furnished Equipment and Government Furnished Equipment, used to test and inspect OPDT supplied parts are maintained and traceable to the National Institute of Standards and Technology (NIST) requirements. A calibration system in accordance with ISO 10012-1, ANSI/NCSL Z540-1, or equivalent will be used by the supplier.

QC104 – CONTROL OF QUALITY RECORDS

All records related to the manufacturing, testing and inspection of parts supplied to an OPDT purchase order will be maintained for a minimum of 7-years unless otherwise specified by the individual OPDT company.

QC105 – SUPPLIER MATERIAL REVIEW BOARD (MRB) AUTHORITY

The Supplier does not have MRB authority to accept or repair non-conforming product. Any nonconformances on final deliverable product to the purchase order, drawing, specifications or applicable documents must be submitted to OPDT for approval prior to shipment.

QC106 – SHELF LIFE

No materials with a shelf-life date will be shipped to an OPDT purchase order with less than 80% of the full shelf-life as determined by the original manufacturer unless previously approved in writing by OPDT. The expiration dates shall be clearly recorded on the packaging and the shipping documents.

QC107 – TEMPERATURE SENSITIVE MATERIAL

The Seller must identify each shipment of temperature sensitive material with the manufacture date, storage temperature and recommended shelf life, in addition to the normal identification requirements of Name, Type, Size, Lot and Quantity. Identification and special handling conditions must be recorded on the shipping document.

QC108 – TEST AND ANALYSIS DATA

The data from any qualification testing, functional testing, analysis test and/or lot acceptance test required for the manufacturing of OPDT parts shall be maintained for a minimum of 7 years and available upon request from the buyer.

QC109 – CERTIFICATION OF SPECIAL PROCESSES

If drawings and/or specifications listed in this purchase order require special processes at the seller or the seller's sub-tier, these processes shall be documented, reviewed and approved by OPDT prior to production. Approval of special processes by OPDT does not absolve the supplier from supplying conforming product.



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These processes include, but not limited to, the following: Bonding, brazing, casting, chemical surface treatments, composites, conformal coating, contamination control, destructive physical analysis (DPA), dye penetration inspection, forging, heat treating of metals, painting, plating, pressure testing, magnetic particle inspections, radiographic inspection, soldering, ultrasonic inspection, welding, or any other process defined in the purchase order.

QC110 – NOTIFICATION RESPONSIBILITY

The Supplier shall inform OPDT immediately where there is a reason to suspect that products previously supplied to OPDT may not be in accordance with the OPDT drawing, specification or purchase order requirement. The Supplier shall promptly inform OPDT of any circumstance related to materials, manufacturing, processing methods, design, etc. which may make a product susceptible to premature failure or otherwise place the safe operation of that product at risk. The notification shall describe the nature of the discovered anomaly, its applicability to OPDT part number(s), quantities affected and the probable impact to the proper function/performance of the item supplied. OPDT shall also be immediately notified in writing of any change to the Supplier's Quality Management team responsible for OPDT products, other significant change in the Supplier's organization, change in financial condition, change in location or change in ownership of the Supplier.

QC111 – CONTROL OF LOWER-TIER SUPPLIERS

The Supplier shall flow-down all applicable OPDT purchase order requirements, including, but not limited to Terms and Conditions and Quality to Sub-Tiers performing work involving this purchase order.

QC112 – SUPPLIER CORRECTIVE ACTION REQUEST

A Supplier Corrective Action will be forwarded by OPDT to a Supplier when corrective action is required. Upon notification of the non-conformance, the supplier shall take immediate containment action and complete the analysis of cause and proposed corrective action within 10 days. Failure to respond in a timely manner may result in the removal of Supplier from the Approved Suppliers Listing. Upon notification of the non-conformance shipments may be suspended until containment processes are enacted

QC113 - SEE 456.

QC200 – QUALITY MANAGEMENT SYSTEM

The seller shall maintain a QMS that complies with the requirements of TS16949. Suppliers registered by an RAB accredited registrar are preferred.

QC201 – QUALITY MANAGEMENT SYSTEM

The seller shall maintain a QMS that complies with the requirements of AS9100. Suppliers registered by an RAB accredited registrar are preferred.

QC202 – FIRST ARTICLE INSPECTION

A first article inspection in accordance with AS9102 is required for this purchase order if one of the following apply:

- (1) First time submission (part or new supplier)
- (2) Revision change affecting form, fit, or function
- (3) A process change used to manufacture the part
- (4) Change in manufacturing location (facility)
- (5) More than 24 months have passed since the supplier last produced part
- (6) As requested by OPDT

All first article inspections performed by the seller will be accompanied with a First Article Inspection Report (FAIR) showing conformance to all drawing or performance requirements specified by OPDT.

QC203 – SOURCE INSPECTION

Parts and materials supplied to this purchase order require source inspection by OPDT or government representative prior to shipment. The supplier will notify the individual OPDT company in advance when parts and materials will be ready for source inspection. It is the supplier's responsibility to ensure part conformance to specified requirements prior to requesting source inspection.

QC204 – SOLDERABILITY

Any solderable parts supplied to OPDT manufactured must meet the solderability requirements of the applicable ANSI/J-Standards.

QC205 – ELECTROSTATIC DISCHARGE CONTROL (ESD)

All electrostatic sensitive devices shall be packaged, marked and handled in compliance with ANSI/ESD S20.20 (or equivalent).



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QC206 – PRINTED CIRCUIT BOARD'S

PCB's will comply with IPC-A-600 unless otherwise specified.

Note: The supplier will default to Class 3 requirements if the class is not otherwise specified on the PO or other buyer supplied documents.

QC207 – CIRCUIT CARD ASSEMBLIES

CCA's will comply with IPC-A-610, Acceptability of Electronic Assemblies, unless otherwise specified.

Note: The supplier will default to Class 3 requirements if the class is not otherwise specified on the PO or other buyer supplied documents.

QC208 – CIRCUIT CARD ASSEMBLIES

CCA's will comply with IPC-J-STD-001, Requirements for Soldered Electrical and Electronic Assemblies unless otherwise specified.

Note: The supplier will default to Class 3 requirements if the class is not otherwise specified on the PO or other buyer supplied documents.

QC209 – WIRING HARNESSSES

Cables and Wiring Harnesses will comply with IPC/WHMA-A-620 unless otherwise specified.

Note: The supplier will default to Class 3 requirements if the class is not otherwise specified on the PO or other buyer supplied documents.

QC210 – REWORK AUTHORIZATION OF CIRCUIT CARD ASSEMBLIES

The seller may rework CCA's supplied to this purchase order in accordance with IPC-7711A.

QC211 – MOISTURE SENSITIVE COMPONENTS

All moisture sensitive components, as classified by IPC/JEDEC J-STD-033 or other documented procedure.

QC212 –SEE 455

QC300 – CERTIFICATE OF COMPLIANCE (C OF C)

All parts supplied to this purchase order will be accompanied by a C of C. the C of C will be dated and signed by the responsible company representative certifying the supplied parts meet all purchase order, specification, and drawing requirements from the buyer. Certifications must include the following:

- (1) OPDT PO Number
- (2) OPDT Part Number, Revision, Serial Numbers and Lot s where applicable.
- (3) Quantity Shipped
- (4) Name of approved lower-tier supplier and descriptions of service provided (if applicable)
- (5) Authorized signature and date.

QC301 – CERTIFICATE OF ANALYSIS (C OF A)

A Certificate of Analysis is required to accompany all materials supplied to this purchase order. The C of A will include:

- (1) Manufacturer's name
- (2) Country of origin/melting/smelting
- (3) Specification number
- (4) Material grade
- (5) Material condition
- (6) Size
- (7) Heat lot
- (8) Date
- (9) Chemical analysis
- (10) Physical properties applicable to the procured material



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QC302 – CERTIFICATE OF TEST (C OF T)

All parts supplied to this purchase order will be accompanied by a C of T. The C of T will be dated and signed by the responsible company representative certifying the supplied parts meet all purchase order, specification, and drawing requirements from the buyer. Certifications must include the following:

- (1) OPDT PO Number
- (2) OPDT Part Number, Revision, Serial Numbers and Lot where applicable
- (3) Quantity Shipped
- (4) Name of approved lower-tier supplier and descriptions of service provided (if applicable)
- (5) Authorized signature and date
- (6) Test Results
- (7) Name and Address of the tester or independent laboratory
- (8) Date and run time if applicable

QC303 – UNIQUE IDENTIFICATION (UID) MARKING REQUIREMENTS

Unique Identification (UID) marking on labels, decals or metal plates shall be per MIL-STD130M. The UID marking shall have a minimum Grade of B when verified per ISO/IEC 15415. Sampling of the verification of the UID marking requirements shall be per ANSI/ASQC Z1.4 using General Inspection Level II and Single Sampling Plans for Reduced Inspection at an AQL of 1.0. The first and last UID marking on labels, decals or metal plates of the lot shall be part of the samples that are verified.

Deliverable: A Certificate of Conformance stating that the labels, decals or metal plates were manufactured in accordance with MIL-STD-130M and verified per ISO/IEC 15415. The Certificate of Conformance shall also state the Grade that was achieved when verified per ISO/IEC 15415. A legible and reproducible copy of the verification that was performed on the labels, decals or metal plates of the sample shall be included with each shipment.

QC304 –SEE RTSA 458

OPDT - Specific Quality Controls

400 –SEE QC106.

401 – AGE CONTROL OF RUBBER GOODS, SAE AMS 2817 / SAE ARP5316

Rubber products shall be packaged in accordance with the drawing requirement and SAE AMS2817 / SAE ARP5316, as applicable. Packages shall be marked appropriately.

402 – SUBMISSION OF TEST REPORTS

Each shipment must be accompanied by a legible copy of the actual results, identifiable to the material, assembly or component submitted. The reports must contain the signature and title of an authorized representative of the agency performing the tests and must assure conformance to the specification, standard or drawing requirements. Test data requirements shall report the following, as specified within this purchase order:

(A) Chemical Properties; (B) Physical Properties; (C) Optical Coating Spectral Data ; (D) Material Data (E) Glass Melt Data; (F) Glass Thorium Content; (G) Coating Durability results; (H) Penetrant inspection; (I) Magnetic Particle inspection; (J) Environmental tests; (K) Laser Damage Data, or (L) Other (specified by Purchase Order).

403 – X- RAY REPORTS

All items included on the purchase order requiring radiographic inspection will be processed in accordance with applicable specifications and standards as specified by purchase order or drawing. All findings will be reported. The X-ray film shall be retained by the supplier for five (5) years and be available to OPDT S&TS – OPTRONICS, INC. OPDT -Florida Quality Assurance Engineering upon request. A legible and reproducible copy of the test report must accompany each shipment. A control number must be assigned to each part and film.

404 – REQUIREMENTS FOR CASTING (TEST BARS)

The Seller shall furnish and maintain the following for a period of 5 years:

- (A) Two (2) test bar specimens representative of the procured casting material composition and heat-treat process for each lot. Specimens shall conform to all material and process specifications in accordance with the purchase order and/or drawing.
- (B) One (1) spectrographic disc representative of the entire heat or melt.
- (C) Castings, test bars and discs, where applicable, shall be permanently identified with seller's name and/or trademark, melt and heat treat number and alloy identification.
- (D) Casting inspection shall be in accordance with SAE-AMS-STD-2175, class and grade as specified on the purchase order and/or drawing.

405 – GOVERNMENT / OPDT SURVEILLANCE

Upon request and during the performance of this order the seller and the seller's sub-tier suppliers Quality Control, Inspection system and manufacturing processes are subject to on-site government and/or OPDT review, verification and analysis.

406 – GOVERNMENT SOURCE INSPECTION

Government inspection is required prior to shipment. Upon receipt of this order, promptly notify the Government Representative who normally services the Seller's facility so that appropriate planning for Government Inspection can be accomplished. In the event, the Representative or office cannot be located, contact the Buyer immediately.

407 – OPDT –SOURCE INSPECTION

All items covered by this OPDT purchase order are subject to source inspection by a OPDT Quality representative. The seller shall furnish, at no charge to OPDT, all necessary facilities, personnel and equipment to perform tests as required by this order. Note: When requesting source verification, contact the buyer whose name appears on this purchase order at least 48 hours in advance.

408 – FIRST ARTICLE

A first article inspection in accordance with AS9102 is required for this purchase order if one of the following apply:

- (1) First time submission (part or new supplier)
- (2) Revision change affecting form, fit, or function
- (3) A process change used to manufacture the part
- (4) Change in manufacturing location (facility)
- (5) More than 12 months have passed since the supplier last produced part
- (6) As requested by OPDT

All first article inspections performed by the seller will be accompanied with a First Article Inspection Report (FAIR) showing conformance to all drawing or performance requirements specified by OPDT. Additional items requiring documentation of conformance may be included in the purchase order if not identified on the applicable drawings, requirements specifications, etc. External packaging and shipping documents for all First Articles sent to OPDT will be clearly identified. Data in FAI documents will be on a white background to facilitate scanning and retention of information. OPDT will advise on quantity requirements for First Article.

409 – FIRST ARTICLE SOURCE INSPECTION

A first article inspection in accordance with AS9102 is required of this procurement if one of the following apply:

- (A) When this condition is specified in the order, the supplier shall follow condition **408** to obtain OPDT approval of the first article, whether or not condition **408** was specifically called out in the purchase order.
- (B) Unless otherwise specified elsewhere within the purchase order, the quantity of first article parts to be submitted for OPDT source inspection is one (1).
- (C) The seller shall furnish, at no charge to OPDT all necessary facilities, personnel and equipment to perform tests as required by this order.

410 – QUALIFIED PRODUCTS LIST COMPONENTS

One or more of the items of this order are required to be produced by a Qualified Product Listed (QPL) supplier. Your certifications must contain evidence of manufacture by a QPL source.

411 –SEE 418

412 – CERTIFICATION OF OPERATORS

The seller shall ensure all individuals performing soldering, welding or radiographic inspection are certified to perform those operations. Operator certificates will be provided to OPDT upon request.

413 – WITNESS SAMPLES / COUPONS

Seller shall provide lot-related witness and/or coupon samples for all First Article Inspection (FAI) reports as specified by the technical data package. All other witness samples for production lots will be retained by the supplier and provided to OPDT upon request.

414 – HAZARDOUS MATERIAL / MSDS AND MANUFACTURER'S PRODUCT / TECHNICAL DATA SHEETS

The seller must ship:

- (1) copy of Material Safety Data Sheet (MSDS) meeting OSHA standards,
- (2) copy of Manufacturer's Products/Technical Data Sheets with this order.

415 – MIL-PRF-22750 OR MIL-DTL-53039 OR MIL-DTL 64159 ORGANIC AND CHEMICAL RESISTANT (CARC) / SURFACE FINISHES

The seller must deliver one (1) copy of the actual validation letter from the Department of the Army, Fort Belvoir, Virginia. The Certificate(s) of Compliance that accompany the shipment must list the manufacturer, batch/lot number, color, and the specification number with applicable revision, with each shipment.

416 – RETURNED MATERIAL PROCESS

Items returned to the Seller that reference this control are believed to have caused or contributed to test or performance failures. Upon receipt, the Seller is to perform the actions necessary to

- 1) investigate the returned unit,
- 2) confirm the failure mode and
- 3) plan and (when authorized by the purchase order), perform the rework necessary to restore the unit to working condition.

The Seller must provide the Buyer with a written report(s) that details by purchase order/contract number, part number and serial number the rework performed and result of the rework (i.e. pass/fail, accept/reject, etc.). If a failure was not confirmed, the report shall so state and identify the investigations performed.

417 – RETURNED FAILURE ANALYSIS REPORT

All returned product must have a failure analysis report completed within fifteen (15) days of receipt of the product. Upon receipt, the Seller is to perform the actions necessary to 1) investigate the returned unit, 2) confirm the failure mode and 3) plan and (when authorized by the purchase order), perform the rework necessary to restore the unit to working condition.

The report shall document the OPDT purchase order number, DMR number (if provided by OPDT), part number, serial number, cause of the failure, corrective action to preclude recurrence and affect on other delivered product. The failure analysis report must accompany the product when returned to OPDT .

418 – SUPPLIER PROCESS CONTROL


These requirements apply to suppliers, and to their sub-tier suppliers. The Contractor shall utilize Statistical Process Control (SPC) techniques as a preferred methodology to ensure production hardware quality and conformity. SPC shall be used to measure, analyze, and eliminate sources of variations detrimental to product quality. SPC shall be administered by the contractor in areas of highest potential benefit and/or on Critical Characteristics flowed down in drawings. The contractor shall prepare a Process Control Plan which will be utilized during production of the articles ordered under this contract. The program should contain the following as a minimum:

1. Process Flow Diagram:

This is a schematic representation of the process flow and the sources of variations of equipment, materials, methods and people from the start to the end of the suppliers' process. The flow diagram should show the test and inspection points as well as those characteristics that are to be monitored and/or statistically controlled (SPC).

2. Key Characteristics:

Key characteristics are those product characteristics that are considered to have a significant impact on the form, fit or function of the part and/or influence customer perception of the end product. Key characteristics are those characteristics that are significantly impacted by the method of manufacture or have a significant impact on subsequent operations.

Key characteristics shall be identified on drawing features with symbol "Δ" with an accompanying notation that identifies the feature as a critical characteristic or with the  symbol (CTQs based on Geometric Dimensioning & Tolerancing techniques).

NOTE: When suppliers do not deliver products based on OPDT drawings and no CTQs are defined (ex., Performance Specification Contracts), Key Process Indicators (KPIs) from the supplier may be used. Key Performance Indicators (KPIs) are monitored metrics that "indicate" how well a process or product is performing. KPIs can be either product performance parameters or process performance metrics (ie. Yields, FPY, Attribute SPC, etc.) These KPIs should be agreed upon between OPDT and Supplier and shall be included as part of the QC-FL418 line item in the PO.

3. Process Capability:

On key characteristics where Statistical Process Control has or will be applied, the supplier shall complete a process capability study for each key characteristic. The capability will include at least 30 parts that have been consecutively run. When purchase order quantities do not allow the use of 30 parts, contact Purchasing/Supplier Quality Engineer at OPDT for the agreed upon number used for the sample. THE PROCESS HAS TO BE IN STATISTICAL CONTROL. The study must demonstrate a minimum Cpk of 1.33 or greater for production capability. In the event that process capability is not demonstrated for key characteristics, these features shall be 100% inspected. Once demonstrated, the feature can be reduced to a valid sampling plan.

Inspection Data and Statistical Capability Reports

Lot Inspection data and associated lot statistical capability study reports shall accompany each delivered production lot with the shipping documentation. The data shall be delivered on CD or electronic storage media that states: "INSPECTION RECORDS" The data shall be delivered in an envelope that states: "INSPECTION RECORDS". Electronic storage media may accompany the documented data. Failure to comply with these requirements shall be cause for lot rejection.

419 – FAILURE MODE AND EFFECTS ANALYSIS REQUIREMENTS

Early in the program's preliminary design phase, the hardware developer is required to identify specific reliability concerns and the steps being taken to mitigate them. The hardware developer is required to conduct either a Concept, Design or Process Failure Modes and Effects Analyses (FMEAs) to a sufficient level of detail that mission critical failures are identified and dealt with effectively. OPDT form 376 shall be used to ensure consistent application of FMEA concepts.

FMEA results will be reported to the buyer as defined within the Purchase Order. The supplier shall complete a FMEA for the items produced and furnished as part of the purchase order. There are three categories of FMEAs that may be required. The supplier shall conduct the FMEA that applies according to the A, B and C selections below. The letter after the QAC number will identify the type of FMEAs requested on this contract and is based on the description of work performed as follows:

A. Concept Failure Mode and Effects Analysis (CFMEA):

The CFMEA shall be performed if the supplier of product(s) is the design agent of the item. The CFMEA is used to analyze concepts for systems and subsystems in the early stages of design and conception.

The CFMEA focuses on potential failure modes associated with the proposed functions of a concept proposal caused by design decisions that introduce deficiencies -- these include design decisions about the process layout. The CFMEA also include the interaction of multiple systems and the interaction between the elements of a system at concept stages (this may also be operation interaction in the process).

CFMEA should be updated and resubmitted whenever a design change occurs.

B. Design Failure Mode and Effects Analysis (DFMEA):

The DFMEA shall be performed if the supplier of product(s) is the design agent of the item. The DFMEA is used to analyze products before they are released to production. DFMEAs identify failure modes caused by design deficiencies and are used to identify Critical to Quality features or characteristics (CTQs)

DFMEA should be updated and resubmitted whenever a design change occurs.

C. Process Failure Mode and Effects Analysis (PFMEA):

The PFMEA shall be performed by the supplier that manufactures or produces the items to this order. The PFMEA is used to analyze manufacturing and assembly processes. The PFMEA focuses on:

1. Potential product failure modes caused by manufacturing &/ or assembly process deficiencies.
2. Confirms the need for Special Controls in manufacturing.
3. Confirms the identification of Critical to Quality features or characteristics (CTQs).
4. Identify process failure modes that could violate government regulations, compromise user health or safety.
5. Identifies processes requiring error proofing to reduce process variability.

420 – SUPPLIER CHANGE AGREEMENT

The Seller agrees that the work produced internally and or the work procured from sub-tier suppliers under this purchase order shall comply with the following requirement unless a documented request for change is approved by OPDT .

1. Work shall not be moved to another production facility.
2. No changes shall be made to the design, manufacturing processes, materials or activities that could potentially affect form, fit, or function without prior approval.
3. A form, fit or function analysis shall be performed, documented with any request for change.
4. A documented process shall be in place to review, identify and submit a request for changes to the Buyer.

A documented request for change shall be submitted to the Buyer 30 days prior to plan implementation. The change will not be implemented unless approved by OPDT .

421 – OTHER

(Consult the OPDT purchase order for this requirement)

422 – COUNTERFEIT COMPONENT PREVENTION

Suppliers of electronic components or production assemblies will have an established counterfeit avoidance program. That program will include a process for component authentication/testing with verified traceability to the OCM. Supplier programs that are not certified to CCAP 101 or audited to SAE AS5553 will be approved in writing by OPDT prior to providing electronic components or production assemblies with electronic components.

Supplier shall notify OPDT when suspect counterfeit materials has been identified.(Reference QC-110) Notification of counterfeit or suspect counterfeit components shall be performed using the OPDT Supplier Request (SR) process. The Supplier shall not deliver products that contain counterfeit items, such as, but not limited to, software, material, and electrical/mechanical parts/assemblies.

423 – INSPECTION AND TEST PLAN

The Supplier shall prepare a detailed inspection plan including all measurement and testing methods. The plan shall include name, type, accuracy and calibration date of measuring and test equipment, as well as measuring record forms that are required for in-process and/or final acceptance of product. For measurement or testing of parts performed in-process, plan shall include process flow. Inspection plan requires by SQE OPDT approval prior to delivery of the first product.

424 - OPTICAL COATING SCANS

Optical coating scan shall be completed on a sample made of the same substrate material and with the same incident angle as it is required per the engineering drawing for the part. The highest resolution scale shall be used, with the scale identified and legible. One copy of the optical coating scan for each coating run, not each deliverable lot, is required and shall be provided to OPDT upon request. The scan shall reference contract number, part number with revision level and lot control number.

425 - OPTICAL COATING WITNESS TEST SAMPLE

A minimum of one (1) witness sample of corresponding material type shall be processed along with each coating run. The witness sample shall be identified, traceable to each coating run.. A witness sample for each coating run not each deliverable lot, is required and shall be retained by the supplier and provided to OPDT upon request. If multiple lots are shipped under the same coating run, the shipping documentation, or the certificate of compliance, shall be traceable to the original coating run

426 - LASER DAMAGE RESISTANCE CERTIFICATION TESTING

Supplier shall perform a laser damage resistance test in accordance with the specifications. The results of the laser damage resistance test shall be included in the first article inspection documentation. Certification stating that shipped product meets laser damage resistance requirements shall be provided for each lot to OPDT upon request. New damage resistance qualification test shall be performed and provided to OPDT when any change in the coating process or material type occurs.

427 - PACKAGING OF OPTICAL COMPONENTS

Optical products shipped under this contract shall be individually packaged and protected from contamination and damage per drawing specification, or using equivalent alternate packaging. Methods of alternate packaging may include lens tissue, cotton bags, membrane boxes, plastic boxes with molded inserts, etc. Individual packages shall be labeled with OPDT part number, revision level, purchase order number, lot number and/or serial number if applicable, and shipping date.



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428 - LOT CONTROL

Products supplied under this Contract shall be identified by the manufacturing lot, or batch number. If it is not practical to stamp individual products due to size or shape, the lot or batch number shall be stamped on identifying tags. All accompanying documents, such as packing list or certifications, shall include lot control number.

429 - USE OF LOWER-TIER SUPPLIERS FOR OTHER THAN SPECIAL PROCESSES

The Seller shall establish and implement tests and inspections necessary to assure the authenticity of a purchased product. Tests and inspections shall be performed in accordance with clearly defined accept/reject criteria provided to the Seller and approved by OPDT. The Seller shall prepare and provide to OPDT records evidencing tests and inspections performed and conformance of the product to specified criteria. Supplier shall have records of the lower-tier supplier's approval on file and available for review by OPDT. Supplier shall identify lower-tier supplier's name, address and process. The Seller is not authorized to ship parts against this Contract until test and inspection results have been submitted and accepted by OPDT. Reference SAE AS5553 for guidance on above requirements. OPDT reserves right to perform surveillance, review or audit of the lower-tier supplier's processes and certification, prior to and during the performance of this Contract. OPDT reserves the right to deny use of lower-tier suppliers if they fail to meet applicable requirements. Supplier is required to notify OPDT if lower-tier suppliers are changed.

430 - REJECTION OF PRODUCT USING SAMPLE INSPECTIONS

OPDT reserves right to use ISO 2589, ANSI/ASQC Z1.4 - 2008, or an equivalent sampling plan for rejection of lots or services supplied under this contract.

431 - DELETED

432 - IPC/EIA J-STD 001, CLASS 3, HAND SOLDERING APPROVAL /CERTIFICATIONS BY LOCKHEED MARTIN

OPDT Suppliers performing Class 3 hand soldering must be approved by Lockheed Martin representatives and must be listed as an approved special process supplier at the supplier gateway website; supplier.external.lmco.com. (Cert Code PWA as a minimum) It is the supplier's responsibility to retain J-STD-001, Class 3, Hand Soldering Lockheed Martin certification as a condition for accepting this purchase order. A survey by Lockheed Martin must be performed every two years unless an extension is granted by Lockheed Martin. Any OPDT supplier utilizing a sub-tier supplier for Class 3 hand soldering must also be surveyed. The OPDT supplier must perform the survey and provide a copy to OPDT Procurement. A Certificate of Conformance must accompany each lot of material.

433- PS CCA CHANGES

Process changes pertaining to CCA cleaning, hand soldering or impedance testing cannot be implemented without written permission from the OPDT Quality Manager for the Apache Program.

434 - ACCEPTANCE TEST PLAN

A detailed Acceptance Test Plan must be submitted to the OPDT for review and approval. This plan shall consist of a test plan and list of equipment employed. Changes must be approved by OPDT prior to first delivery against the Purchase Order. The data from any qualification testing, functional testing, analysis test and/or lot acceptance test required for the manufacturing of OPDT parts shall be maintained for a minimum of 7 years and available upon request from the buyer.

435 - CORRECTIVE ACTION

The Sellers quality control system shall provide means for ready detection of discrepancies and for prompt and effective corrective action. A Supplier Corrective Action will be forwarded by OPDT to a Supplier when corrective action is required. Corrective action must be positive and specific, including firm effectivity points by serial number, part number, date or other methods. When corrective action is required by the government, the Seller shall coordinate such action with the Government source inspector at his plant. Upon notification of the non-conformance, the supplier shall take immediate containment action and notify OPDT Quality when containment is complete. Supplier shall complete the analysis for root cause and proposed corrective action within 15 days unless otherwise specified on a SCAR. Failure to respond in a timely manner may result in the removal of Supplier from the Approved Suppliers Listing. Upon notification of the non-conformance shipments may be suspended until containment processes are enacted.

436 - CALIBRATION SERVICES

It is the seller's responsibility to ensure all equipment, including Customer Furnished Equipment and Government Furnished Equipment, used to test and inspect OPDT supplied parts are maintained and traceable to the National Institute of Standards and Technology (NIST) requirements. The seller shall provide and maintain a calibration system that complies with ANSI/NCCL Z540-1, ISO 10012-1, or equivalent. Seller shall provide a certificate of calibration for all items of this order which shall include the following minimum items: identification of the item calibrated, calibration source, instruments or standards used calibration results, adjustments made, certifying statement to one of the specifications referenced above, and the signature and date of an authorized representative.

437 - MATERIAL AND PROCESS CONFORMANCE

The seller shall provide upon request a Certificate of Conformance (C of C) for all materials and services provided to OPDT. The C of C's shall contain a minimum of the following information:

1. Original manufacturers name and address.
2. Purchase order number.
3. Part number, drawing number, revision, specification number, revision and quantity.
4. Serial numbers, date code, or lot numbers (as applicable).
5. A statement of conformance to all order requirements.
6. A signature of an authorized company representative and the date signed.

The Seller shall retain the original C of C and all relevant supporting data on file for OPDT review for four years after completion of this purchase order.

438 - DRAWING AND CHANGE CONTROL

The Seller's system shall assure that the latest applicable drawings, specifications, technical requirements, purchase order information and changes thereto, will be available. All changes shall be processed in a manner that will ensure incorporation on the affected supplies at specified effectivity points.

439 - CERTIFIED SUPPLIER

The Seller has met all the requirements for the OPDT, Certified Supplier Program. Suppliers are responsible to ensure compliance for materials used to manufacture parts supplied to OPDT. Suppliers will only purchase materials from Original Equipment Manufacturer's (OEM's), standard catalogues, or the OEM authorized distributors. Purchasing from independent brokers or other sources is not authorized unless approved in writing by OPDT. The Seller's quality system and production operations are subject to periodic audits by the Buyer or Buyer's representative.

440 - CUSTOMER WITNESS

A representative of for OPDT's customer may witness any inspection or test required by this Purchase Order without affect of OPDT's exclusive right to give direction to the Seller or to accept or reject any procedure, test data or article.

441 - DESIGN

When design is the Seller's responsibility, but requires OPDT, approval, changes shall not be made without written authorization from OPDT via the purchase order or statement of work.

442 - DELETED. REPLACED WITH 422

443 - ESD CONTROL PROGRAM

Items to be delivered under this order are defined by the buyer as electrostatic discharge sensitive (ESD). The Seller shall have an ESD control program, which precludes ESD damage during all phases of fabrication, testing, handling, storage, and packaging for delivery. Non-manufacturing distributors shall handle, store, package and identify such items under an ESD control program which ensures the continuation of the manufacturer's ESD control program. Shipping containers and packing slips shall have prominent marking/identification, which identifies contents as ESD sensitive.

444 - GENUINE PART(S) CERTIFICATE OF CONFORMANCE AND TRACEABILITY

Upon request the Seller shall provide a signed Certificate of Conformance and Traceability (CoCT) for every delivery to OPDT stating that all parts and work have been procured from Original Equipment Manufacturers (OEMs), Original Component Manufacturers (OCMs), or their authorized distributors, or other OPDT approved sources. An OEM or OCM is the organization who designs and controls the manufacture of an item. The OEM/OCM warrants performance of the item to its published specifications. This is the source of supply typically called out on OPDT drawings, or Approved Sourcing Lists that specify source of supply. A Manufacturer's representative may be the primary contact with an OEM/OCM. Reference SAE AS5553 for guidance on above requirements. Certifications must also include the following: OPDT PO number, OPDT part number, revision, serial numbers and lot where applicable, quantity shipped, name of approved lower-tier supplier and descriptions of service provided (if applicable), and authorized signature and date.

445 – INSPECTION REPORT

Dimensional Inspection data for all critical/major characteristics defined by the drawing and /or PO and indication of acceptance for minor characteristics shall be included in an inspection report on items delivered under this Purchase Order. This report shall reference part number, revision level, serial numbers and Purchase Order number. This report shall be available at time of delivery and shall be shipped with the material.

446 - SEE 436

447 - DELETED

448 - PHYSICAL/CHEMICAL ANALYSIS OF MATERIAL

A laboratory certificate of actual physical and/or chemical data is required for this material, and shall be made available upon request. The Seller must identify each shipment of temperature sensitive material with the manufacture date, storage temperature and recommended shelf life, in addition to the normal identification requirements of Name, Type, Size, Lot and Quantity. Identification and special handling conditions must be recorded on the shipping document.

449 - PROHIBITED PRACTICES

The following acts or practices are typical of those prohibited:

1. Unauthorized Repair - Repair (by welding, brazing, soldering or use of adhesives) of parts damaged or found faulty in the fabrication processes; repairing holes in castings, forging or other materials by plugging, welding or brushing, without authorization by OPDT .
2. Unauthorized Processing - Addition, revision or deletion of processes in manufacturing when processes are subject to specification control by OPDT .
3. Disregard of Approvals - Change in any process or quality control procedure that is subject to approval by OPDT without proper notification and re-approval.
4. Improper Material Submittal - Submission of material having known defects/problems, to OPDT without notification and approval.
5. Improper Material Re-submittal – Re-submittal of material to OPDT without material being clearly identified as resubmitted.

450 – RECORDS

The Seller shall maintain adequate records of inspection, tests and other quality control activities. Records shall provide objective evidence of the quality control operations performed, the results obtained and corrective action taken. Such records shall be available to OPDT . Records shall be retained for a period of at least four (4) years

451 - SPECIAL PROCESSES

The Seller shall establish a system to assure that thermal, chemical, metallurgical or other critical processes, the control of which cannot be readily determined by inspection of the part, will be performed in accordance with the specification requirements, in adequate facilities, by competent personnel using proper procedures. When critical or special processes are performed outside the Seller's facility, it shall be the responsibility of the Seller to assure proper performance of all such processes, through surveys, certification, testing, etc. These processes include soldering, welding, X-ray, magnetic particle and penetrant inspection, heat-treating, plating, anodizing, etc. The Seller/Manufacturer shall not implement any change(s) in material, processes or controls without prior written approval of OPDT , via the purchase order.

452 - SELLER CONTROL OF SUB-TIER SPECIAL PROCESSES

If the Seller uses sub-tier suppliers for the Special Processes, then the Seller must either have their system to control their sub-tier suppliers approved by OPDT , or the sub-tier suppliers must have current approval by OPDT for the Special Processes. Should the Seller's system be approved to control the sub-tier suppliers, the Seller shall have records of this approval on file and available for review by the OPDT Quality Representative. Approval of Special Process sub-tier suppliers by OPDT does not relieve the Seller of the responsibility for assuring that work performed by sub-tier suppliers is in accordance with specification requirements. The Seller shall identify the Special Processors that performed the Special Processes, (including the Seller) by process specification and supply this information to the Buyer prior to first delivery.

453 – Drop-shipped Parts and Material

When the seller is requested by OPDT to drop-ship parts or material to a location other than OPDT, they will include a copy of the purchase order along with all required data and certifications specified by the purchase order's Quality Assurance Codes (QAC's / QC's). The seller will also send electronic copies of the packing slip and tracking information to the OPDT buyer at the time of shipment. The seller will ensure source inspection is performed or a waiver for such inspection is received from OPDT Quality prior to shipment if the purchase order contains a Quality Condition requiring source inspection.

The receiving organization of drop-shipped material will notify the buyer when parts and materials are received. The receiver will also verify the appropriate type and quantity of materials and ensure such materials are undamaged by handling and shipping. The receiver will immediately notify the OPDT buyer of any problems or concerns with received materials.

454 – Process Validation (PVA) / Frozen Process (FP)

The supplier shall notify OPDT prior to start of production so that the process is validated. Process Validation consists of the elements listed above and is a joint effort between the supplier and OPDT S&TS – OPTRONICS' Procurement and Supplier Quality Assurance Departments. [Reference OPDT S&TS – Optronics Div. Form #365, PROCESS VALIDATION ASSESSMENT (PVA) INFORMATION TEMPLATE / FROZEN PROCESS (FP)]

The purpose of the process validation is to “baseline” the supplier's fabrication, assembly, inspection, and test processes, SPC implementation plan, and inspection/test points. Once validated, the process is considered “Frozen” and OPDT must be advised in writing of any process changes for approval. The supplier is responsible for submitting information and data concerning any proposed change to OPDT.

Changes include, but are not limited to, materials, processes, procedures, design, software, machines, plant facilities, location of manufacture or sources of supply.

Routine Process Verification

OPDT will perform process verification on a routine basis to assess conformance to agreed process baseline.

455 – INTERCONNECT STRESS TEST (IST) REQUIREMENT

Bare boards shall be tested according to IPC-TM-650, Method 2.6.26 from coupons as outlined in IPC-6012, and inspected to IPC-A-600. Test coupon design, if not specified by OPDT, is the suppliers responsibility but requires approval prior to board fabrication. Test parameters will be determined using the smallest VIA diameter (mills (10⁻³in)), minimum trace width (mills (10⁻³in)), and number of layers. Table 1 shows the maximum resistance change, in percent, and the number of thermal cycles for testing. Regardless of complexity of the board all coupons are to be tested to 150 °C. The coupons shall be located on two adjacent sides of the panel near the edge, and therefore oriented in the “x” and “y” axis. The first and last panel coupons will be the only coupons tested unless the number of panels is greater than 10. When the number of panels exceeds 10, both coupons from 50% of the full panel build will be tested in addition to the first and last panel coupons. Optional testing methodology, including modification of sample size and coupon features, is acceptable if approved by OPDT.

Table 1. Test Parameters*

Via Dia. (x10 ⁻³ in)	Trace Width (x10 ⁻³ in)	Number of Layers *							
		22	20	18	16	14	12	10	
4	3	5%, 500	5%, 481	5%, 481	5%, 481	6%, 462	6%, 442	7%, 423	7%, 423
	4	5%, 481	5%, 481	5%, 481	6%, 462	6%, 442	7%, 423	7%, 404	7%, 404
	5	5%, 481	6%, 462	6%, 462	6%, 442	6%, 442	7%, 404	7%, 385	7%, 385
	6	6%, 462	6%, 462	6%, 442	6%, 442	7%, 423	7%, 404	8%, 365	8%, 365
	7	6%, 462	6%, 442	6%, 442	7%, 423	7%, 404	7%, 385	8%, 346	8%, 346
	8	6%, 462	6%, 442	7%, 423	7%, 404	7%, 385	8%, 365	8%, 327	8%, 327
5	3	5%, 481	6%, 462	6%, 462	6%, 442	6%, 442	7%, 404	7%, 385	7%, 385
	4	6%, 462	6%, 462	6%, 442	6%, 442	7%, 423	7%, 404	8%, 365	8%, 365
	5	6%, 462	6%, 442	6%, 442	7%, 423	7%, 404	7%, 385	8%, 346	8%, 346
	6	6%, 462	6%, 442	7%, 423	7%, 404	7%, 385	8%, 365	8%, 327	8%, 327
	7	6%, 442	7%, 423	7%, 423	7%, 404	7%, 385	8%, 346	9%, 308	9%, 308
	8	6%, 442	7%, 423	7%, 404	7%, 385	8%, 365	8%, 327	9%, 288	9%, 288
6	3	6%, 462	6%, 442	6%, 442	7%, 423	7%, 404	7%, 385	8%, 346	8%, 346
	4	6%, 462	6%, 442	7%, 423	7%, 404	7%, 385	8%, 365	8%, 327	8%, 327
	5	6%, 442	7%, 423	7%, 423	7%, 404	7%, 385	8%, 346	9%, 308	9%, 308
	6	6%, 442	7%, 423	7%, 404	7%, 385	8%, 365	8%, 327	9%, 288	9%, 288
	7	7%, 423	7%, 404	7%, 404	7%, 385	8%, 346	9%, 308	10%, 269	10%, 269
	8	7%, 423	7%, 404	7%, 385	8%, 365	8%, 346	9%, 308	10%, 250	10%, 250

* if layers < 10 use 10 Criteria, if Layers > 22 use 22 criteria
Table information is (% Resistance, Cycles)

In the event of a test coupon failure, remove damaged coupon and continue testing remaining coupons, notify OPDT of the failure mode and number of cycles completed for further evaluation.

456 - PACKING SLIP INFORMATION

Packing slips must contain the following information:

- Packing Slip Number
- Part Number *
- Part Description
- Part Number Revision (if applicable)
- PO Number *
- PO Line Number *
- Quantity shipped *
- Buyer Name.

Items identified by an asterisk (*) will also contain a corresponding 2D matrix or linear code 39 barcode



Procurement Quality Controls

Purchase Order Attachment I

457 - SUPPLIER CONTAINER LABEL

External packaging for all shipped materials will be labeled as follows:

Supplier Container Label: 4" W x 6" H

Left and Right margins = .0625"

Top and Bottom margins = .0625"

Actual Box/Table size = 3.875" W x 5.8125" H *NOTE: These dimensions are accurate within approximately 1/16th of an inch.

Barcode = Data Matrix (human readable approximately .5" high), centered in cell/box (see example)

Font = Arial 12 pt.

Special characters not allowed: &, ?, #, *

Format exceptions may be made with submittal and acceptance from OPDT.

Project and Task to be added when provided on OPDT Purchase Order

458 – OBSOLESCENCE

Suppliers of Circuit Card Assemblies are required to inform OPDT- of component availability risk discovered at any time during the performance of this contract. Notice, Impact, and recommendations are expected to be communicated no more than 10 days from discovery using 's Supplier Request (SR) system.

459 – RESTRICTION OF HAZARDOUS SUBSTANCES (RoHS)

The processes used and product supplied to this purchase order shall be RoHS compliant per the EU directive on the restriction of the use of certain hazardous substances, by not exceeding the specified limits of those hazardous substances, as contained in the latest directive and decisions (revisions).

A statement of RoHS compliance is required for all deliveries.

460 – Frank-Dodd Act

Seller's acknowledgement and acceptance of this purchase order signifies that the seller is aware and in compliance with the Frank-Dodd Act formally known as Public Law 111-203, H.R. 4173 Section 1502 regarding the purchase and use of Conflict Minerals in seller's products offered for sale. Further seller acknowledges that its First Tier suppliers are aware and in compliance with the requirements of the Frank-Dodd Act, Public Law 111-203, H.R. 4173 Section 1502. In addition, Seller shall maintain records, in accordance with its own policies and procedures, documenting the first tier suppliers awareness and compliance with the Act

- End -