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GENERAL QUALITY ASSURANCE PROVISIONS

**The General Quality Assurance Provisions listed below are an integral part of each nLIGHT purchase order which references any Specific (numbered) QAP. These General QAP's are in addition to all other clauses, provisions, instructions and terms and conditions.**

IT IS THE SUPPLIER'S RESPONSIBILITY TO MAKE SURE CURRENT REVISIONS OF nLIGHT DRAWINGS AND COMPONENT SPECIFICATIONS ARE OBTAINED FROM THE nLIGHT BUYER BEFORE FULFILLING EACH PURCHASE ORDER. IT IS THE SUPPLIER'S RESPONSIBILITY TO MAKE SURE CURRENT REVISIONS OF ALL REFERENCED STANDARDS ARE USED, UNLESS nLIGHT SPECIFIES OTHERWISE IN THE PURCHASE ORDER, DRAWING OR COMPONENT SPECIFICATION FOR THE ITEM.

SHIPMENT OF MATERIAL IMPLIES COMPLETE COMPLIANCE WITH ALL PURCHASE ORDER REQUIREMENTS AND RELATED SPECIFICATIONS AND STANDARDS.

**A. QUALITY MANAGEMENT SYSTEM:**

The Supplier must have an established and maintained Quality Management System compliant to an Industry recognized Quality Standard, such as ISO 9001 or AS9100. The Supplier's Quality Management System must be available for nLIGHT review. Suppliers having certified or registered Quality Management Systems must notify nLIGHT immediately, if that certification or registration was not renewed or was revoked.

**B. PURCHASE ORDER RECEIPT AND VERIFICATION:**


The Supplier must verify all Purchase Orders issued by nLIGHT upon receipt. Any discrepancies in price, quantity, specifications, quality requirements, packaging, or delivery requirements must be communicated to and resolved with nLIGHT Purchasing, before taking action on the Purchase Order.

**C. DELIVERY:**

nLIGHT expects 100% on time delivery. Deliveries are considered on time, if the required product, as specified on the Purchase Order is received on the due date or up to 7 calendar days early. Required supporting documents, such as, packing lists, certificates of conformance, certificates of analysis, material safety data sheets, etc., must arrive with, or prior to receipt of the shipment.

**D. CONFORMANCE TO REQUIREMENTS:**

nLIGHT expects all material and components to arrive defect free. Product is expected to meet all Purchase Order requirements and referenced specifications and standards, unless a Waiver Request has been submitted by the Supplier and approved by nLIGHT's Buyer in writing, prior to shipment. (If the Supplier does not have a Waiver Request Form, nLIGHT can provide a template on request).

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**E. UNAUTHORIZED REPAIRS:**

The Supplier must not repair products damaged or found to be faulty during fabrication, by any method including, but not limited to, welding, brazing, plugging, soldering or use of adhesives unless authorized by nLIGHT in writing, utilizing a Waiver Request Process.

**F. NOTIFICATION OF CHANGE:**

The Supplier must maintain strict controls to assure that, after the purchased item(s) successfully passes any required qualification, no changes will be made to any design, material, part, process, procedure, tooling or test equipment; nor shall they be altered, redesigned or replaced by any other design, material, part, process, procedure, tooling or test equipment, without nLIGHT's prior written approval. The Supplier must provide First Article data after the implementation of all changes ( see QAP P). The definition of change does not include editorial or administrative changes such as spelling or typographical errors, clarifications, personnel, maintenance, or equipment changes not affecting the qualified product. In addition, the items must not be produced at a facility other than the Supplier's original facility which produced the acceptable items, without nLIGHT's prior written approval.

Upon receipt of any such notification from the Supplier, nLIGHT will have the right to direct the Supplier to repeat all or part of the qualification at the Supplier's expense and to obtain from the Supplier all data necessary to prove the acceptability of the proposed change. nLIGHT reserves the right to cancel the Purchase Order(s) if the changes are deemed unacceptable. Failure to notify nLIGHT of such changes may result in removal of the Supplier from nLIGHT's Approved Suppliers List.

**G. OUTSOURCING/SUB-CONTRACTING MANUFACTURING PROCESSES**


Outsourcing or sub-contracting of any manufacturing process must be approved by nLIGHT in advance. The Supplier must provide qualification data for any proposed sub-contractors. If the outsourcing of any manufacturing process is approved by nLIGHT, the Supplier must maintain lot traceability and lot integrity (i.e. no partial outsourcing of a Supplier lot). The Supplier is responsible for flowing down the requirements of this QAP to their sub-contractor.

**H. CONTROL OF SUB-TIER SUPPLY**

The Supplier's procurement documents must describe appropriate methods to flow down requirements necessary to assure the Supplier's procured items conform to nLIGHT's drawing, component specification and Purchase Order requirements (including QAPs listed therein). Purchased supplies must be subjected to inspection after receipt, to assure conformance to Purchase Order requirements. The Supplier must request all sub-contractors or sub tier suppliers to provide corrective action(s) and/or replacements, as and when necessary. The Supplier must retain on file at their facility, all chemical and mechanical test data for raw materials used on this Purchase Order.

**I. DELIVERY OF DEFECTIVE ITEMS:**

In the event the Supplier determines that material previously delivered to nLIGHT was defective, written notification to the nLIGHT's Buyer is required within thirty (30) calendar days.

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**J. IMPROPER SUBMITTAL OF PREVIOUSLY REJECTED PRODUCTS:**

Product previously rejected by nLIGHT and reworked or repaired by the Supplier, must be identified in the shipping documents. Reference to nLIGHT’s rejection documentation must be noted. Failure to identify previously rejected product may be cause for rejection and return of the material at the Supplier’s expense.

**K. FAILURE ANALYSIS**

The Supplier must perform failure analysis on product(s) returned under this Purchase Order and provide nLIGHT with a report within thirty (30) calendar days. The following information must be included as a minimum and must be validated by an authorized Supplier’s representative, by either an inspection stamp or a signature:

- Supplier’s name and address; date of report; Purchase Order number; item part number;
- Suppliers RMA number; root cause(s) of failure; containment actions taken to prevent shipping further items with the same defect; corrective and preventive action plans (with due dates) that address the identified root causes.

Failure to respond within the thirty day time frame may result in the removal of the Supplier from nLIGHT’s Approved Suppliers List.

**L. PROPER SUBMITTAL OF DOCUMENTATION:**

Adequate records of inspections, tests, and certifications must be maintained throughout the manufacturing process by means deemed suitable by the Supplier. This information must be maintained on file and must be supplied to nLIGHT upon request. nLIGHT may refuse to accept product if the Supplier fails to submit any documentation specified in the Quality Assurance Provisions of the Purchase Order.


**M. CALIBRATION SYSTEM:**

The Supplier’s calibration system for measuring and test equipment must be in compliance with the latest revision of ISO10012, or equivalent. The Supplier’s calibration system must be approved by nLIGHT and is subject to review and approval at any time by nLIGHT. The Supplier retains full responsibility for ensuring that all products, lower-tier suppliers, supplies used, and/or services furnished hereunder, comply with all applicable calibration requirements.

**N. IDENTIFICATION, PRESERVATION, AND PACKAGING:**

All shipments to nLIGHT must be packaged to avoid damage and deterioration and must be shipped to the address specified on the PO unless otherwise noted. Packaging must be in accordance with good commercial practices unless otherwise specified on the Purchase Order. Items must not be intermingled unless otherwise specified. Each box or container must be labeled and have as a minimum the following information: (1) nLIGHT part number, (2) PO number, (3) PO Line Item, (4) Quantity (5) Manufacturer’s lot number (and Manufacturer’s part number if applicable) and (6) Country of Origin.

Product supplied to nLIGHT shall comply with nLIGHT standard QI-STD-0002

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**O. SUPPLIER CORRECTIVE ACTION REQUEST:**

A Supplier Corrective Action will be forwarded by nLIGHT to a Supplier when corrective action is required. Upon notification of the non-conformance, the Supplier must take immediate containment action(s) and complete the analysis of root cause(s) and propose corrective action(s) with anticipated completion dates within 14 calendar days. Failure to respond in a timely manner may result in the removal of the Supplier from nLIGHT’s Approved Suppliers List. Upon notification of the non-conformance, shipments may be suspended until containment processes are established.

**P. FIRST ARTICLE:**

For the first article produced, the supplier must conduct, document and report inspections and tests that verify conformance to all requirements. The supplier’s report shall include, as a minimum: 1) purchase order number; part number; revision level; part name; specimen serial number(s); the drawing and specification requirements, including tolerances; 2) the tool/method used to perform each inspection; 3) actual measured and accepted inspection/test results; 4) material certifications of chemical/physical analysis; 5) the actual accepted first article specimen(s) identified as “first article inspection sample” and traceable to the report’s measured data; 6) when functional testing is required, a diagram of the test set-up, test equipment used, test equipment tolerances, calibration identifications with the last calibration date of the test equipment.

First Article Inspection Reports in accordance with AS9102 are preferred (nLIGHT can provide report forms on request). The first article inspection report is required from the supplier when any one of the following conditions exist or occur:


- a) The Supplier has never provided this product or service before.
- b) There has been a lapse in the Supplier’s production of this item exceeding 12 months.
- c) Following the incorporation of a form, fit, or function change for the item (see F).
- d) A material, design, tooling and/or process change(s) affects the original qualification testing of the product.
- e) Following damage and subsequent repair to tooling, fixtures, dies or equipment used in the manufacturing process which affects, or has the potential to affect, the specification parameters or attributes.
- f) The supplier has made changes to their location of production.
- g) A change has been made to a Supplier proprietary product that may affect the product purchased by nLIGHT or the performance of a higher assembly

It is acceptable to only do partial qualification testing related only to those characteristics affected by the change. This delta qualification must be approved in advance and in writing, by nLIGHT. Further qualification requirements are defined by Specific Quality Assurance Provisions referenced in the purchase order.

**Q. CONFLICTS:**

The document hierarchy; Purchase Order, product drawing, component specification, then secondary standards and specifications identified within, shall take precedence in the event of conflicts with the QAP requirements within this document. The QAPs are quality requirements in addition to the aforementioned core documents.

**R. SAFETY DATA SHEETS**

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Safety Data Sheets must be made available for materials that are identified in 29 CFR 1910.1200 and the Registry of Toxic Effects of Chemical Substances (published by NIOSH).

S. Not used

T. PACKAGING STANDARD:

Product supplied to nLIGHT shall comply with nLIGHT standard QI-STD-0002.

### SPECIFIC QUALITY ASSURANCE PROVISIONS

The Specific Quality Assurance Provisions which may be required as part of each purchase order are detailed below. These provisions when called for by reference number on the purchase order are in addition to all other clauses, provisions, instructions and terms and conditions of purchase and are a part thereof by reference.

#### 1. PROHIBITED MATERIALS

- A. The use of Ozone Depleting Chemicals (ODC's) in the processing of materials or products delivered on this order is not allowed. If the product requires the use of ODC's, this must be brought to the attention of the nLIGHT buyer prior to any such processing. The notification to nLIGHT must include the reason that alternative chemicals or processing cannot be substituted for ODC usage. Written authorization from nLIGHT is required prior to processing products for this order with ODC's. This requirement must be flowed down by the Supplier to any sub-tier supplier or processor utilized in the production of this order.
- B. The items supplied under this purchase order must contain no metallic mercury or mercury compounds and must be free from mercury contamination. During manufacturing, test or inspection, the items supplied must not come in contact with mercury or any of its compounds nor with any mercury containing devices employing only a single boundary of containment. Note: A single boundary of containment is one not backed by a second seal or barrier to prevent contamination in the event of an accidental rupture of the primary seal or barrier. In the event this requirement cannot be met contact the nLIGHT buyer. This requirement must be flowed down by the Supplier to any sub-tier supplier or processor utilized in the production of this order.

#### 2. Restriction of Hazardous Substances (RoHS)

- A. nLIGHT's Customers have evaluated and determined that at this time RoHS compliance is not desirable due to reliability concerns regarding lead free electronic or electrical assemblies, circuits, or components. Therefore, the following requirements are established:
  - Tin-lead solder is the required solder attachment material. Other solders must not be used unless specifically required by the drawing or component specification.
  - The use of tin plating without at least 3% lead (with or without other additives) must be avoided as a termination finish on procured parts unless there is no alternative. If tin without lead is the only alternative, it must be matte tin per ASTM B545. Bright tin plating must not be used. Note: This applies to component leads and terminations,

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carriers, bodies, cages, brackets, housings, mechanical items, hardware (nuts, screws, and bolts), etc. This does not apply to MIL-SPEC Parts or nLIGHT drawings that allow the use of tin with less than 3% lead.

- RoHS-compliant commercial off the shelf (COTS) assembly (i.e., made with lead-free solder and tin plating without lead) must be avoided whenever possible because of the risks associated with the use of these materials. If such a COTS assembly must be used, it must be only after a formal engineering review and/or experimental verification demonstrates that it is capable of meeting application quality and reliability requirements. Whisker mitigation techniques must be applied.
- If tin plating without lead is used on a product, whisker growth mitigation techniques must be applied. The mitigation employed may be different depending on the material and its application. More than one mitigation measure may be required depending on the item and its criticality in the application. The Supplier must maintain records supporting the mitigation techniques used and the analysis to justify the techniques.
- All fine pitch (lead spacing less than or equal to 1 mil) and all grid-array devices must be tin-lead plated. When these are not available in tin-lead plate then re-plating or re-balling is required.
- An area array package (e.g., BGA) with lead-free balls must be used with tin-lead solder only after formal engineering review and/or experimental verification demonstrates that it is capable of meeting application quality and reliability requirements. Lead-free balls can be re-placed with tin-lead balls as a means of avoiding the need for a formal review or verification.

The Supplier must include a statement relating to this QAP in Certificates of Conformance provided with each lot shipped. The C of C shall mean that the Supplier or Supplier's agent has verified that delivered product meets the above listed composition requirements, or the material meets at least one of the following provisions:

- a. The Supplier or the Supplier's agent has contacted the Original Equipment Manufacturer (OEM) and verified that the specific Mfr / Lot Date Code of delivered product meets the specified minimum lead requirement if tin is present in the product.
- b. The Supplier or the Supplier's Subcontractor has verified by actual sample testing (X-ray Fluorescence testing is preferred) or other industry acceptable method that a minimum of 3% lead is present in any process that uses tin.


The Supplier is responsible for managing the compliance with this requirement with subcontractors or sub-tier suppliers and provide evidence of the appropriate flow-down and management of this requirement to the satisfaction of the nLIGHT buyer.

All exceptions must be authorized in writing by the nLIGHT buyer.

- B. Compliance with European Directive 2011/65/EU, amended by Directive 2015/863, is required for this Purchase Order.

The hazardous substances are:

- |   |                 |
|---|-----------------|
| • Cadmium (Cd)                            | 0.01% by weight |
| • Lead (Pb)                               | 0.10% by weight |
| • Mercury (Hg)                            | 0.10% by weight |
| • Hexavalent Chromium (Cr <sup>6+</sup> ) | 0.10% by weight |
| • Polybrominated Biphenyls (PBB)          | 0.10% by weight |

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- Polybrominated Diphenyl Ethers (PBDE) 0.10% by weight
- Bis(2-Ethylhexyl) phthalate (DEHP) 0.10% by weight
- Benzyl butyl phthalate (BBP) 0.10% by weight
- Dibutyl phthalate (DBP) 0.10% by weight
- Diisobutyl phthalate (DIBP) 0.10% by weight

The percentage weight of these hazardous substances is not measured as a percentage of the complete part or assembly, but of any homogenous material that can be mechanically separated from the part or assembly.

### 3. CONFLICT MINERALS

The supplier is responsible for ensuring that none of the following material used in parts or assemblies supplied to nLIGHT, originate from the Democratic Republic of the Congo or an adjoining country (Angola, Burundi, Central African Republic, the Republic of the Congo, Rwanda, South Sudan, Tanzania, Uganda and Zambia):

- gold,
- columbite-tantalite or its derivatives (e.g. tantalum),
- cassiterite or its derivatives (e.g. tin), or
- wolframite or its derivatives (e.g. tungsten)

### 4. CRITICAL FOR SAFETY PART

This part is considered by nLIGHT to be critical for the safe operation of nLIGHT product. As such, suppliers of Commercial Off The Shelf (COTS) parts must ensure all parts are new and genuine (see QAP 85A for more information) and suppliers of custom parts must obtain nLIGHT approval before making any change to the part or processes used to manufacture it or to rework it in a non-standard manner.

### 5. REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals)


Compliance with European Directive 1907/2006 is required for this Purchase Order. Any material listed in the current version of the Candidate List of Substances of Very High Concern (SVHC) used in the article provided to nLIGHT, shall be reported as follows:

- SVHC name
- Weight of SVHC in the article
- Weight of the article

If no SVHC is contained in the article, this shall be reported to nLIGHT.

### 6. COMMERCIAL OFF THE SHELF (COTS) PARTS

nLIGHT recognizes that it is unreasonable to expect manufacturers of COTS parts to comply with unique demands from every customer. However, the numbered QAPs in this purchase order are considered to be Industry-acceptable requirements and compliance is therefore expected.

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The inclusion of this QAP in nLIGHT's purchase order removes the requirement to comply with all lettered QAPs in this document, although compliance is preferred.

7. TSCA (Toxic Substances Control Act )

Compliance with the Regulation of Persistent Bioaccumulative and Toxic Chemicals under TSCA section 6(h) is required for this Purchase Order. Any material as listed below shall be reported to nLIGHT:

- Decabromodiphenyl ether (DecaBDE)
- Phenol, isopropylated phosphate (3:1) (PIP (3:1))
- 2,4,6-Tris(tert-butyl)phenol (2,4,6-TTBP)
- Hexachlorobutadiene (HCBD)
- Pentachlorothiophenol (PCTP)

8. RESERVED FOR FUTURE USE

9. RESERVED FOR FUTURE USE

10. QUALIFICATION

Qualification testing per the drawing and/or component specification(s) is required for this Purchase Order. Qualification samples and the associated test data shall be identified and packaged separately from the production items.

11. FIRST ARTICLE INSPECTION REPORT UNDER AS9102


When this provision is invoked on the Purchase Order, it precedes the QAP P (FIRST ARTICLE).

For the first article produced, the supplier shall submit the FAIR (First Article Report) by following Standard AS9102 Form 1, Form 2, Form 3. An advance approval (AS9102 Form1 Section 23 signed/stamped as approved) from nLIGHT needs to be obtained prior to delivery of any shipment.

The first article inspection report is required from the supplier when any one of the following conditions exist or occur:

- The Supplier has never provided this product or service before.
- There has been a lapse in the Supplier's production of this item exceeding 24 months.
- Change to this product or service that affecting Form, Fit and Function.
- Any material, tooling or process change affects the original qualification testing of the product.
- Following damage and subsequent repair to tooling, fixtures, dies or equipment used in the manufacturing process which affects, or has the potential to affect, the specification parameters or attributes.
- The supplier has made changes to their location of production.



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12. RESERVED FOR FUTURE USE
13. RESERVED FOR FUTURE USE
14. RESERVED FOR FUTURE USE

15. MIL-PRF-38534


- A. Group A test data, and any additional requirements identified in nLIGHT's component specification, must be kept on file at the Supplier and available for review by nLIGHT and/or nLIGHT's Customer(s) and Government representatives upon request. Supplier generic data is acceptable
- B. Group B test data, and any additional requirements identified in nLIGHT's component specification, must be kept on file at the Supplier and available for review by nLIGHT and/or nLIGHT's Customer(s) and Government representatives upon request. Supplier generic data is acceptable
- C. Group C test data, and any additional requirements identified in nLIGHT's component specification, must be kept on file at the Supplier and available for review by nLIGHT and/or nLIGHT's Customer(s) and Government representatives upon request. Supplier generic data is acceptable
- D. Group D test data, and any additional requirements identified in nLIGHT's component specification, must be kept on file at the Supplier and available for review by nLIGHT and/or nLIGHT's Customer(s) and Government representatives upon request. Supplier generic data is acceptable

16. RESERVED FOR COMMERCIAL PRODUCT

17. CERTIFICATES OF CONFORMANCE

- A. A Certificate of Conformance must be provided with each shipment and for each lot of material contained within, stating compliance to all requirements specified in the Purchase Order (including all QAPs), drawings, component specifications and referenced standards, and specifically including the following:
  - Manufacturer's name and address
  - nLIGHT's name, address and PO number
  - Item part number, revision and description
  - Lot identification code (including plant code as applicable) if QAP 36 (Traceability) is required
  - Statement of conformance with date
  - Quantity of units in the shipment
  - Statement certifying product conformance and traceability
  - Statement certifying material authenticity if required by Counterfeit Part Prevention
  - Signature or name or stamp of appropriate representative and date of transaction

The Supplier must have records on file to substantiate product compliance to the Contract and will furnish copies of these records upon request of nLIGHT's or nLIGHT's customer representative(s).

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When material is provided by nLIGHT the Supplier must furnish a signed certification stating that the items supplied are made from material furnished by nLIGHT. Certification shall be identifiable to the original nLIGHT Shipping documentation.

- B. Material supplied on this contract must be accompanied by a Certificate of Analysis, which must include:
1. Original manufacturer's name and address
  2. Purchase Order number
  3. Item part number, revision, and quantity
  4. Drawings and/or specification number and revision
  5. Serial numbers or date code or lot number if traceability is required
  6. QA signature or stamp, and date
  7. Statement of conformance to all requirements

The Certificate of Analysis must include actual discrete data (physical and chemical analysis report) taken from the material supplied. The actual quantity of each constituent measured must be listed and compared to the requirements of each constituent identified in the applicable specification. The Supplier must also retain the Certificate of Analysis and physical or chemical analysis reports on file for the longer of five years after completion of the nLIGHT Purchase Order or as QAP 110 specifies, if called out in the purchase order.

**18. CERTIFICATE OF ORIGIN OF PRODUCT**


- A. The Supplier must supply information stating the country of origin of the finished material or article, as required by 19 CFR Part 134 – Country of Origin. For items qualifying as “Made in the USA” but where physical marking of the country of origin is prohibited by nLIGHT drawing or Component Specification or where the marking will affect the intended operation of the item, the supplier must provide an affidavit signed by an officer of the company indicating the country of origin. Items not qualifying as “Made in the USA” must be marked or tagged with the country of origin.

19. The Supplier must provide access to their facilities at all reasonable times by nLIGHT or its authorized Customer representatives and Regulatory Authorities. The Supplier must include and require its (sub-tier) suppliers to include, the substance of this QAP in its purchase documents, in support of this nLIGHT Purchase Order.


20. The Supplier must include and require its (sub-tier) suppliers to include, the substance of the first paragraph of QAP A, including the intent of this sentence, in its purchase documents, in support of this nLIGHT Purchase Order.

21. RESERVED FOR FUTURE USE
22. RESERVED FOR FUTURE USE
23. RESERVED FOR FUTURE USE
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**27. PACKAGING**

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- A. Parts must be provided in suitable inner packaging which will not:
  - Fail a visual cleanliness inspection
  - Readily generate, shed, attract or harbor particulates
  - Cause or leave residue or particulate on the part(s) being supplied
  - Produce a noticeably strong odor
  - Create an ESD hazard for nLIGHT products
- B. The shipping tag, bag, or container must be permanently and legibly marked in accordance with MIL-STD-130. The marking must include the following information:
  - a. Part Description and nLIGHT Part Number
  - b. Purchase Order Number and Line number (if applicable)
  - c. Quantity shipped
  - d. Serial Number or range of Serial Numbers (if applicable) – see also QAP 37
  - e. Date Code (YYWW for a fixed point in the Supplier’s manufacturing process – start of process is preferred) or unique Lot Number – see also QAP 36
  - f. Manufacturer’s Name. ESD Symbol if required
  - h. Country of Origin
- C. The shipping tag, bag, or container must be permanently and legibly marked. The marking must include the following information:
  - a. Part Description and nLIGHT Part Number
  - b. Purchase Order Number and Line number (if applicable)
  - c. Quantity shipped
  - d. Serial Number or range of Serial Numbers (if applicable) – see also QAP 37
  - e. Date Code (YYWW for a fixed point in the Supplier’s manufacturing process – start of process is preferred) or unique Lot Number – see also QAP 36
  - f. Manufacturer’s Name
  - g. ESD Symbol if required
  - h. Country of Origin
- D. ESD-sensitive devices must be packaged in ESD-shielded bags or containers (compliant with ANSI/ESD S541) with an appropriate ESD warning label in a prominent position
- E. Environmentally-sensitive material, parts shall be provided with inner packaging that is suitable for handling and storage in nLIGHT’s factory. The inner packaging format shall be agreed by nLIGHT. Instructions regarding storage and handling of the parts shall be provided on the inner packaging.
- F. The inner package and outside shipping package shall be from low outgassing and low particulate materials. A low residue cleanroom tape and a desiccant pack can be included in the inner package; Supplier must provide a Certificate of Analysis as part of the First Article Inspection approval process certifying that the inner package and outside shipping package are from low outgassing and low particulate materials. Certification from the original manufacturer is also acceptable. A Change to the packaging materials shall follow nLIGHT QAP F(NOTIFICATION OF CHANGE) and accordingly subject to nLIGHT APPROVAL with a Certificate of Analysis to certify the compliance to the low outgassing and low particulate requirement.
- G. The delivery of the first production material will be considered a test shipment to determine the effectiveness of designed packaging. It requires a pre-shipment notification and

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submission of pictures of all inner, intermediate, and final packaging / palletization for shipment, including label format at positioning. Written (e-mail) permission will be given by nLIGHT based on a review of the pre-shipment submission. Once approved and after a successful test shipment, changes to packaging, quantity, or materials require a resubmittal for approval.

- 28. RESERVED FOR FUTURE USE
- 29. RESERVED FOR FUTURE USE


30. PART MARKING

- A. The item must be legibly marked in accordance with MIL-STD-130 in a suitable area determined by the Supplier and approved by nLIGHT, with the applicable serial number using low outgassing ink, laser marking, etching or other mechanical means
- B. The item must be legibly marked in accordance with MIL-STD-130 in the area specified by nLIGHT on the drawing or component specification, with the applicable serial number using low outgassing ink, laser marking, etching or other mechanical means
- C. The marking on items supplied (i.e., part number, serial number, date code, etc.) must meet the marking permanency requirements of the applicable specification. For inks, the test methods of “Resistance to Solvents” namely, MIL–STD 202, Method 215; MIL–STD–750, Methods 1022; or MIL–STD–883 Method 2015.
- D. The inside of the part should be marked with Vendor’s number in a location specified by nLIGHT or determined by the supplier and approved by nLIGHT. In general, outside surfaces are either marked as such or marked with a higher cosmetic class than the inside of the part. All locations without Class A cosmetic requirements or not noted as exterior surface are acceptable for vendor marking. The vendor number can be requested from nLIGHT Supply Chain representative. An identification other than the vendor number can be used with nLIGHT approval.
- E. The part shall be marked with nLIGHT Part Number and revision in a location specified by nLIGHT or determined by the supplier and approved by nLIGHT.
- F. Marking on part must comply with UL969

- 31. RESERVED FOR FUTURE USE
- 32. RESERVED FOR FUTURE USE
- 33. RESERVED FOR FUTURE USE
- 34. RESERVED FOR FUTURE USE

35. SERIALIZATION

- A. Each part, component or assembly supplied on this Purchase Order must be identified with a distinct serial number. Serial numbers must not be duplicated for one part, component or

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assembly number when manufactured in sequential lots. The Supplier is responsible for managing the creation, allocation and tracking of part numbers.

- B. Each part, component or assembly supplied on this Purchase Order must be identified with a distinct serial number. Serial numbers must not be duplicated for one part, component or assembly number when manufactured in sequential lots. nLIGHT will provide the serial numbers to be used with each Purchase Order
- C. Five character alpha-numeric serial number required. For example: 1AB2C
- D. Six character alpha-numeric serial number required. For example: VABC23 where V is a vendor code agreed between vendor and nLIGHT. Except vendor code, alphabetic character "I", "L", "Z", "B", "Q", "O", "W", "G" and "S" must not be used.
- E. Serial number format is VVYYWW1234567R00XXXX where VV=vendor code, YY=year code, WW=week code, 1234567=nLIGHT Part Number, R00=nL Part Number rev, XXXX=unique serial number within week, part number and rev. Use highest assembly number on main label if more than one serialized component is present.
- F. Barcode required
- G. QR code required.
- H. Each part, component or assembly supplied on this Purchase Order must be identified with a distinct serial number. Serial numbers must not be duplicated across different part numbers, components or assemblies from different manufacturing lots. The supplier is responsible for managing the creation, allocation and tracking of serial numbers.
- I. Serial number format is YYVXXX where YY=year code, V=vendor code, XXX=unique serial number

#### 36. LOT CONTROL NUMBERS

Products supplied under this Purchase Order must be identified by the Supplier's manufacturing lot, or batch number. This lot control number must be traceable to all the Supplier's critical manufacturing processes. All accompanying documents, such as packing list or certifications, must include the lot control number. Different lot numbers in the same shipment must be segregated and clearly identified.

#### 37. DATE CODES


The supplier must identify the quantity of each date code in each lot and sub lot delivered in each shipment. This information shall be provided on the packing list. Each lot and sub lot shall be segregated in the shipment.

#### 38. RESERVED FOR FUTURE USE

#### 39. RESERVED FOR FUTURE USE

#### 40. TRACEABILITY

- A. Items furnished under this Purchase Order must be identified by lot number, description, item part number, and revision level, to be clearly traceable back to the original manufacturer. The traceability documentation and/or records must accompany each shipment of this Purchase Order.

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- B. Semiconductor and/or microcircuit devices, furnished by distributors, must be clearly traceable back to the original manufacturer. The traceability documentation and/or records must accompany each shipment.
- C. Electrical, Electronic Components, and Electromechanical Components Only: The requirements listed below are imposed to ensure product traceability and to verify authenticity of manufacturing origin for these products. The requirements below do not apply in these two cases:


- The Supplier is the Original Component Manufacturer (OCM) or the Original Equipment Manufacturer (OEM) documenting direct product traceability and verification of authenticity of product or;
- The Supplier is an OCM/OEM Authorized Distributor that has obtained the components to be delivered under this PO directly from the OCM/OEM, documenting direct product traceability and verification of authenticity of product. The Supplier/distributor is authorized by the OCM/OEM to distribute their components.

The Supplier must provide supply chain traceability from the OCM/OEM, aftermarket manufacturer, or manufacturer Authorized Distributor, to guarantee the components traceability back to the original manufacturer. The supply chain traceability documentation must identify the name and location of all supply chain intermediaries beginning with the component manufacturer, through the direct source of the components for the Supplier. Minimum certification documentation required shall be Material Certification from the OCM/OEM for raw materials with a Certificate of Conformance for the product. If not possible due to proprietary disclosure limitations, a Certificate of Conformance (C of C), that also states proprietary limitations from the OCM/OEM will be acceptable. A C of C from the distributor is not acceptable for traceability back to the OCM/OEM. Note:

- Certificates of Conformance from non-franchised distribution sources are not adequate to meet the supply chain traceability requirements, therefore will not be accepted.
- For supply chain traceability sources outside of the United States, the Supplier shall request and obtain written authorization from nLIGHT Buyer, prior to shipment of any of these products.

When evidence of direct supply chain traceability to the OCM/OEM is not possible, the Supplier can submit all components to a verification of authenticity process, prior to shipment. nLIGHT will review the documentation and evidence to determine if this data provides adequate verification of authenticity and traceability of the products. The alternative is to obtain and deliver product that has a documented traceability back to the OCM/OEM as the specification requires. This process shall include the following actions:

- Active Electronic Components: Verify that component marking and packaging labeling are consistent and that component marking meets permanency and black topping test requirements. Capture under high enough magnification to clearly observe these features, digital photographs, top and bottom of one component for each date code are to be provided in the verification package, as well as a clear photograph of the product packaging. Component marking and packaging labeling must be clearly legible in the photographs.

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- For all components: Inspect for manufacturer, MIL-Spec required markings, dimensions, external visual (per MIL-STD-883, Method 2009), and for external counterfeit clues.
- For all components: 100% test to the applicable drawing, or in accordance to the applicable industry/military requirements, or manufacturer's data sheet (static/DC parameters). The Supplier must not ship any products failing this testing process to nLIGHT, unless authorized in writing by the nLIGHT Buyer.
- For components with internal die cavities: Unless the supplier requests and obtains a waiver, in writing, from the nLIGHT Buyer, both De-cap and x-ray are required as follows:
  - De-cap internal visual on a component sample to include at least one part from each date code, performed in accordance with MIL-STD-883, Method 2014, with clear digital photographs. The Supplier shall verify die topology and markings to be authentic to the OCM/OEM specific markings, or by a comparison to other verified authentic components or images.
  - 100% x-ray inspection Per MIL-STD-883, Method 2012 (digital format).

Note: Supplier must verify any mixed construction and/or construction anomalies within a single date code identified on the De-cap or X-ray inspection, to be authentic by the OCM/OEM, or validated against a known authentic component prior to shipment. The Supplier must submit verification records and results, including a copy of X-ray and digital photographs, for the components that pass the inspections and testing above with the delivery, subject to acceptance by nLIGHT. The Supplier must not ship components which fail the testing/inspections under this PO. Supplier shall also maintain documentation as quality records.


41. RESERVED FOR FUTURE USE
42. RESERVED FOR FUTURE USE
43. RESERVED FOR FUTURE USE

44. POST-PLATING TEST STANDARDS

Sampling plan is to follow ASTM-B602 Table 4 except a Witness Sample Plan is allowed and approved. Sampling plan is applied to any of tests as below listed:

- A. Plating Thickness Report to be provided.
- B. Heat Test is provided per ASTM-B488 Section 9.5.2. After the parts are heated to 300 to 350°C for 30 minutes, no flaking, blistering, or peeling can be seen at 10X magnification.
- C. Peeling Test is required per ASTM-B488 Section 9.5.2 or ASTM-B571 Section 11. Under ASTM-B488 Section 9.5.2, after the parts are heated to 300 to 350°C for 30 minutes, a peeling test is applied.

No flaking, blistering, or peeling can be seen on the test part and test tape at 10X magnification. Using "898" Type of 3M Scotch Tape, whose adhesive side is applied to the

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plating surface under test. Care being taken to exclude all air bubbles. After an interval of 10 s, the tape is removed by applying a steady pulling force to the tape, perpendicular to the surface of the plating.

- D. The bonding surface shall be free of contamination, mechanical defects (e.g. dent, bump, scratch etc.), missing gold with underneath plating layer or substrate exposed, by inspection without magnification. If Die Shear Test is required, Die Shear Strength requirement is to follow MIL-STD-883E Method 2019.5
- E. The bonding surface shall be free of contamination, mechanical defects (e.g. dent, bump, scratch etc.), missing gold with underneath plating layer or substrate exposed, by inspection without magnification. If Wire Pull Test is required, Bond Pull Test requirement is to follow MIL-STD-883E Method 2011.7

#### 45. SOLDERING STANDARDS

- A. Solder connections must be in accordance with IPC/EIA J-STD-001 Class 1
- B. Solder connections must be in accordance with IPC/EIA J-STD-001 Class 2
- C. Solder connections must be in accordance with IPC/EIA J-STD-001 Class 3


#### 46. SOLDER MATERIAL STANDARDS

- A. Soldering material must comply with:
  - Flux must be in accordance with IPC J-STD-004 with activity level L0 or L1. No-clean fluxes are prohibited unless specifically authorized by nLIGHT.
  - Solder alloys must be in accordance with IPC J-STD-006. Fluxes contained in solder wire or preforms must comply with IPCJ-STD-004 and activity levels L0 and L1.
  - Solder paste must be in accordance with IPC J-STD-005. Fluxes contained in the solder paste must comply with IPC J-STD-004 and activity levels L0 and L1.
- B. Soldering material must comply with:
  - Flux must be in accordance with IPC J-STD-004. No clean flux is allowed
  - Solder alloys must be in accordance with IPC-J-STD-006. Fluxes contained in solder wire or preforms must comply with IPC J-STD-004
  - Solder paste must be in accordance with IPC J-STD-005. Fluxes contained in the solder paste must comply with IPC J-STD-004  
Cleaning processes for assemblies using no-clean fluxes, must be pre-approved, in writing, by nLIGHT Engineering or Quality.

#### 47. OPTICAL STANDARDS

- A. Fabrication of optical components must be in accordance with MIL-PRF-13830
- B. Fabrication of optical components must be in accordance with ISO 10110
- C. The item's optical elements coating durability must be in accordance with ISO 9211



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- D. Optical products/lenses must contain no thorium or other source materials, as defined by AMCR 385-29, Title 10, Code of Federal Regulations, part 40 or any other radioactive materials
- E. Laser Threshold Damage Testing must be in accordance with ISO 11254

**48. ELECTRICAL CABLE STANDARDS**

Components of cable assemblies (wire, connectors, heatshrink, etc.) must be certified by an appropriate Nationally Recognized Test Laboratory (NRTL) such as UL, CSA, ETL etc. Records of compliance must be available for inspection at nLIGHT's request. Cable assemblies must be manufactured in compliance with IPC/WHMA-A-620 Class 2.

**49. COSMETIC STANDARD**

Product supplied to nLIGHT shall comply with nLIGHT standard QI-STD-0001.

**50. CONTROL PLAN REQUIREMENTS**

The supplier must create a Control Plan for this part. The plan must detail the steps that are taken to ensure the accuracy and quality of the part, from incoming inspection to packaging for part shipment. The Control Plan must follow QS-9000 or similar format and include those parameters that are to be monitored and tracked for ensuring zero escaping defects and maximizing supplier yields. A template can be provided by nLIGHT upon request. The Control Plan must be submitted to nLIGHT Supplier Quality Engineering for review and approval.

**51. CABLE ASSEMBLIES/FLEX CIRCUIT ADDITIONAL FAI REQUIREMENTS**

Cable Assemblies testing requirements to be presented as part of the First Article Inspection Report:

- Connectors to be pulled tested (per connector manufacturer specification) prior to continuity testing
- Flex test/twist to detect potential intermittent defects
- 100% continuity wiring check
- 100% hipot insulation resistance

**52. EDGE QUALITY DEFINITIONS**


**A. Remove Sharp Edges**

Edges defined by this level of finishing will be smoothed to the extent that the hands will not be cut, nor would electrical wires or mating parts.

**B. Remove all visible burrs**

No projections visible to the unaided eye are permitted beyond the normal plane of adjacent surfaces. This specification level also requires that edges shall not be sharp to the extent that they could cut hands, wiring cables, or mating parts.

**C. Remove all burrs visible at 4X magnification**

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No projection visible at defined magnification are permitted beyond the normal plane of adjacent surfaces. This specification level also requires that edges shall not be sharp to the extent that they could cut hands, wiring cables, or mating parts. Tactile or other non-optical inspection approaches are not allowed in this level of deburring.

D. Remove all burrs visible at 10X magnification

No projection visible at defined magnification are permitted beyond the normal plane of adjacent surfaces. This specification level also requires that edges shall not be sharp to the extent that they could cut hands, wiring cables, or mating parts. Tactile or other non-optical inspection approaches are not allowed in this level of deburring.

E. Break edges

Edges shall be chamfered, blunted, or smoothed such as material falls above the chamfer of the indicated minimum dimensions. Small burrs may remain on edges of the chamfers, and some raised material may remain near edges. Any material left at edges shall not cause product dimensions to fall out of their drawing tolerances.

53. OPTICS CLEANING AND PACKAGING STANDARD

Product supplied to nLIGHT shall comply with nLIGHT standard QI-PP-0003.

54. RESERVED FOR FUTURE USE

55. DFARS – SPECIALTY METALS

This Purchase Order incorporates either the contract clause at:

DFARS 252.225-7014 Alt. I; or DFARS 252.225-7014 Alt.I (Deviation); or

DFARS 252.225-7014 (Deviation No. 2006-O0004); or

DFARS 252.225-7014 Alt.I (Deviation No. 2006-O0004); or

DFARS 252.225-7014 (Deviation No. 2007-O0011); or


DFARS 252.225-7014 Alt.I (Deviation No. 2007-O0011); or

DFARS 252.225.7014 (Deviation No. 2008-O0002); or

DFARS 252.225-7014 Alt.I (Deviation No. 2008-O0002);

whichever is applicable. The Supplier must flow down the applicable clause above, to all of their vendors that supply any articles delivered under this purchase order that include specialty metals. All such clauses provide the same definition of specialty metals and prohibit nLIGHT and all of its suppliers, at every tier, from incorporating specialty metals into military parts, components and/or end item deliverables unless the specialty metals have been smelted (the Deviation clauses add “or produced”) in the United States, its outlying areas, or a qualifying country listed in DFARS 225.872-1.

Exemptions to requirements of the above clauses may exist, as outlined in the clauses themselves or by operation of applicable Department of Defense Domestic Non-Availability Determinations (DNADs) posted on its public web site for that purpose. If you believe an exemption(s) apply, please specify the specifics and provide nLIGHT with documents and information sufficient to demonstrate your entitlement thereto.

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56. DFARS –SPECIALTY METALS

- 252.225-7008 RESTRICTION ON ACQUISITION OF SPECIALTY METALS (JUL 2009)
- 252.225-7009 RESTRICTION ON ACQUISITION OF CERTAIN ARTICLES CONTAINING SPECIALTY METALS (JUL 2009)
- 252.225-7010 COMMERCIAL DERIVATIVE MILITARY ARTICLE – SPECIAL METALS COMPLIANCE CERTIFICATE

The Supplier must flow down the clauses above to all their vendors that supply any articles delivered under this purchase order that include Specialty Metals.

Note that the -7008 clause applies to the acquisition of Specialty Metal stock whereas the -7009 clause applies to any product incorporating Specialty Metals. The definition of “Specialty Metals” is the same in both clauses and the clauses prohibit nLIGHT and all of its suppliers, at every tier, from incorporating Specialty Metals into military parts, components and/or end item deliverables unless, the Specialty Metals have been melted or produced in the United States, or its outlying areas or, (for -7009 only) a qualifying country.

Note the -7009 clause contains numerous exceptions in subparagraph (c) including the “Qualifying Country” exception (see countries listed in DFARS 252.003(9)), an exception for Commercial Off-the-Shelf (COTS) items incorporating Specialty Metals, and other potential exceptions. Note that -7009 subparagraph (d) is not available per subparagraph (e).

57. RESERVED FOR FUTURE USE

58. RESERVED FOR FUTURE USE

59. RESERVED FOR FUTURE USE

60. ITAR

The items indicated in this PO are under International Traffic in Arms Regulations (ITAR) control. Suppliers must comply with 22 CFR, Part 120. Non-U. S. citizens employed by suppliers are not permitted to and will not have access to nLIGHT drawings or component specifications unless the Supplier is registered with the Department of State and is in compliance with the rules regarding employment of non U. S. citizens.

The Supplier must disclose any circumstance, situation, or possibility of the above conflict with ITAR regulations. Non-disclosure is a violation of ITAR and can be cause for contract termination as well as potential punitive and civil fines, both personally and corporate, as imposed by ITAR regulations.

61. RESERVED FOR FUTURE USE

62. RESERVED FOR FUTURE USE

63. RESERVED FOR FUTURE USE

64. RESERVED FOR FUTURE USE


65. ESD

The Supplier must have an ESD Program in place that is compliant with ANSI/ESD S20.20

66. RESERVED FOR FUTURE USE

67. RESERVED FOR FUTURE USE

68. RESERVED FOR FUTURE USE

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69. RESERVED FOR FUTURE USE

70. FOD

The Supplier must establish and maintain an effective Foreign Object Damage (FOD) Prevention Program to reduce FOD using NAS412 as a guideline.

The Supplier's program must utilize effective FOD prevention practices. The program must be proportional to the sensitivity of the design of the product(s) to FOD, as well as to the FOD generating potential of the manufacturing methods.

The written procedures or policies developed by the Supplier are subject to review and audit by nLIGHT, their Customer and/or Government representative, and disapproval when the Supplier's procedures or policies do not accomplish their or nLIGHT's objectives.

71. RESERVED FOR FUTURE USE

72. RESERVED FOR FUTURE USE

73. RESERVED FOR FUTURE USE

74. RESERVED FOR FUTURE USE


75. CONTROL OF SPECIAL PROCESSES - NADCAP

When Special Processes are identified on the drawing and/or component specification that are NADCAP Controlled Special Processes (see below), all Supplier and lower-tier supplier work performed to those required Special Processes, must be performed by NADCAP Accredited sources. That accreditation must be current and remain so throughout the fulfillment of the Purchase Order.

(PRI administers the NADCAP audit program: [www.pri-network.org](http://www.pri-network.org)). The Supplier and/or lower-tier supplier (whoever performs the work) will be considered as an approved supplier for the NADCAP Special Processes if:

- The Supplier or lower-tier is first certified to perform the specific Special Process(es) required by the Purchase Order, drawing and/or component specification. The current NADCAP certification number and expiration date must be sent to nLIGHT for validation.
- Upon nLIGHT approval of the Supplier to perform a NADCAP Special Process, the Supplier or lower-tier will require minimum surveillance or audit activity provided, the Supplier remains current with their NADCAP Certification to perform the required Special Process(s), during the course of executing the Purchase Order.
- There are no non-conformances detected relative to the Special Process(s) applied to the product. nLIGHT reserves the right to deny or curtail the use of any (primary or second-tier) Special Process Supplier if they cannot meet and maintain the above requirements.

Suppliers must submit a complete listing of all lower-tier suppliers' names, addresses, and the applicable Special Process(s) that the lower-tier supplier shall perform to satisfy the Purchase Order. This information/documentation must be provided with the first article documentation package, to be delivered with the first shipment of material, and each delivery of product thereafter. The Supplier is required to notify nLIGHT if they or lower-tier Special Process suppliers, change/modify their processes, or are no longer NADCAP certified to perform a required Special Process. The Supplier must notify nLIGHT if lower-tier Special Process suppliers have changed. All products supplied to nLIGHT having had NADCAP processes applied, must include on all certification documents from the original processor:

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- The NADCAP “Mark of Conformity” including identification of applicable special process commodity.
- The specific qualified specification(s) or standard(s) used in the course of manufacturing the product.
- The supplier or sub-tier supplier’s NADCAP Certification Number and Expiration date for each special process used.


When Special Process specifications (i.e. welding, soldering, etc.) are not furnished by nLIGHT or stated within the Purchase Order, drawing and/or component specification, the Supplier must submit Special Process requirements, procedures and sequences, prior to production, for nLIGHT’s review and approval. If it is a NADCAP Special Process, proof of certification shall be provided. Following review and approval, no revisions or modifications may be made to the Special Process procedures or control plans without additional approval of nLIGHT. They become Fixed Processes.

NADCAP Processes
Chemical Processing: anodizing, chemical cleaning & milling, conversion coating, paint, dry film, plating coatings, stripping, surface treatment, passivation, etching
Optic Component fabrication, coating, and/or testing
Coatings: thermal spray, cementation, vapor deposition, lab evaluation, stripping, heat treat of coated parts, dry film lubrication
Composites: prepreg/adhesive bonding metal bonding, core processing, liquid resin processing
Heat Treating: metal systems, heat treating processes, heat treating equipment, brazing, hot forming
Materials Testing Laboratories: chemical analysis corrosion, DTA, hardness, tensile testing, metallography, mechanical test
Non Destructive Testing: magnetic particle, ultrasonic, radiography, dye penetrant,
Nonconventional Machining and Surface Enhancement: electrochemical machining (ECM), electrochemical grinding (ECG), electrical discharge machining (EDM), laser beam machining (LBM)
Sealants: manufacturing, testing, quality
Welding: torch, flash welding, electron beam welding, resistance welding, fusion welding, laser welding, friction/inertia welding

#### 76. CONTROL OF SPECIAL PROCESSES – nLIGHT SPECIAL PROCESSES

When Special Processes are identified on nLIGHT drawings and/or component specifications that are nLIGHT Special Processes, all Supplier and lower-tier supplier work performed to those required Special Processes, must be performed by nLIGHT approved sources. Names and contact details for nLIGHT Special Process suppliers will be provided by nLIGHT.

Below is the list of nLIGHT Special Process Commodities. The Special Processes applied to this Purchase Order, must meet all requirements of all applicable drawings and component specifications.

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nLIGHT SPECIAL PROCESSES
Printed Circuit Board Fabrication in accordance with IPC-A-600: Acceptability of Printed Boards (For printed, rigid, flexible and rigid flexible circuit boards)
Printed Circuit Board Assembly in accordance with IPC-A-610: Acceptability of Electronic Assemblies
Wire harness and cable assemblies in accordance with IPC/WHMA-A-620: Acceptability of Electronic Wire Harnesses and Cables
Gold Plating: nLIGHT approved suppliers must be used
Optical coating: nLIGHT approved suppliers must be used

77. PRINTED CIRCUIT BOARD ASSEMBLIES (PCBA)

PCBA suppliers shall ensure that their assembly processes are suitable for the components specified in the nLIGHT Bill of Material (BoM) and will not degrade the components' performance or reliability. Components not in the nLIGHT BoM (including equivalent parts from unapproved manufacturers) shall not be substituted without an nLIGHT approved waiver request. nLIGHT specifying the components/manufacturers in BoMs does not remove the PCBA supplier's responsibility of complying with all other QAPs called out in the PO, including, but not limited to QAPs 2, 3, 5, and 85.


- 78. RESERVED FOR FUTURE USE
- 79. RESERVED FOR FUTURE USE
- 80. RESERVED FOR FUTURE USE
- 81. RESERVED FOR FUTURE USE
- 82. RESERVED FOR FUTURE USE
- 83. RESERVED FOR FUTURE USE
- 84. RESERVED FOR FUTURE USE

85. COUNTERFEIT PART PREVENTION

A. Documentation:

In the Certificate of Conformance, the Supplier must represent and warrant that only new and authentic materials are used in the products delivered to nLIGHT and that the parts/product delivered contains no Counterfeit Parts and that acquisition documentation is available that accurately authenticates traceability of the parts.

“Counterfeit Parts” are defined as any part, component, module, or assembly whose origin, material, source of manufacture, performance, or characteristics are misrepresented. This term includes, but is not limited to, (A) parts that have been marked or re-marked to disguise them or falsely represent the identity of the manufacturer, (B) defective parts and/or surplus material scrapped by the original manufacturer, (C) parts previously shipped, reclaimed and provided as “new”, and (D) parts that are represented as passing Original Component Manufacturer (OCM) testing, verifying, screening and quality control requirements, when that is not the case.

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Parts or material are considered “new” if they are unused and the Seller provides full warranty for part/material performance, including reliability.

**B. COTS Items:**

Counterfeit Part Prevention requirements for Commercial Off The Shelf (COTS) parts or nLIGHT unique items that include COTS parts:

Where the nLIGHT drawing, Component Specification, or Purchase Order specifies Original Component Manufacturer (OCM) part numbers, only these parts are to be used. These must either be purchased directly from the OCM or from an OCM-certified Distributor. Proof of this Distributor certification is to be provided to nLIGHT on request.

Where the nLIGHT Drawing, Component Specification, or Purchase Order does not specify Original Component Manufacturer (OCM) part numbers, the Supplier can use any source that meets the nLIGHT documented requirements. However, the Supplier must still purchase these parts directly from an OCM or from an OCM-certified or authorized Distributor. Proof of this Distributor certification is to be provided to nLIGHT on request.

Purchase of parts/components from Independent (i.e. non OCM-certified or authorized) Distributors is not authorized unless first approved in writing by nLIGHT. The Supplier must present complete and compelling support for its request and include in its request all actions to ensure the parts/components thus procured are legitimate parts. nLIGHT’s approval of the Supplier’s request(s) does not relieve the Supplier’s responsibility to comply with all Drawing, Component Specification, and Purchase Order requirements.

The Supplier must maintain a documented system (policy, procedure, or other documented approach) that provides for prior notification and nLIGHT approval before parts/components are procured from sources other than OCMs or through OCM-certified Distributors’ chain.


The Supplier must flow these Counterfeit Part requirements to all subcontractors and suppliers at any tier for the fulfillment of this Purchase Order.

**C. Unique Parts or Items:**

Counterfeit Part Prevention requirements for unique parts:

Where the nLIGHT Drawing is for a unique part (i.e. not a commercial off the shelf part), the Supplier must provide material certification for the material used in the construction of the component, in addition to any required Certificate of Conformance for the part.

No other material, part, or component other than that which is new and authentic is to be used, unless approved in advance in writing by nLIGHT.

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If any part used in the construction of the unique part supplied to nLIGHT is a COTS item, QAP 85B applies to that part, irrespective of whether the Purchase Order calls out QAP 85B or not.

If any material used in the construction of the unique part supplied to nLIGHT is considered bulk or raw material, QAP 85D applies to that material irrespective of whether the Purchase Order calls out QAP 85D or not.

The Supplier must flow these Counterfeit Part requirements to all subcontractors and suppliers at any tier for the fulfillment of this Purchase Order.

D. Bulk or Raw Materials:

The Supplier must represent and warrant that only new and authentic bulk materials are delivered to nLIGHT and that acquisition documentation is available upon request that accurately authenticates traceability of the constituent materials.

For bulk materials, “new” means the bulk material comes from an original batch, has been tested, meets all specifications and has not left the supplier’s custody until shipped to nLIGHT or used within the same supplier.

Sourcing of the bulk or raw materials follows a chain of custody to ensure authorized sources are used with appropriate controls. Use of recycled materials allowed as long as from authorized sources with appropriate controls to ensure conformance to material specifications.

Any suspect bulk material that does not meet all these requirements cannot be used and nLIGHT must be notified within 7 days of any suspect material that has already been shipped.

Purchase of constituent materials from Independent (i.e. not an Original Manufacturer or Certified) Distributor is not authorized unless first approved in writing by nLIGHT.

This provision must be flowed down thru the supply chain to all tiers.


E. Distribution Items Traceability:

The Distributor must provide acquisition documentation that accurately authenticates traceability of the parts back to the Original Manufacturer, including the Original Manufacture’s Certificate of Conformance.

- 86. RESERVED FOR FUTURE USE
- 87. RESERVED FOR FUTURE USE
- 88. RESERVED FOR FUTURE USE
- 89. RESERVED FOR FUTURE USE

90. CONFIGURATION CONTROL



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An nLIGHT approved manufacturing configuration baseline is required. nLIGHT may allow shipment of product prior to formal baseline approval provided the Supplier is working with nLIGHT to establish one. The baseline package must consist of the following:

A single drawing under the Supplier's Change Control System listing the Supplier's assembly drawing, component piece part drawings, material drawings/specifications, and Manufacturing process Instructions for all critical manufacturing operations. Each document listed will include the document name, unique identification number, and revision level and/or revision date. This baseline drawing must have its own name, unique number, revision level, and revision date for future change control. This drawing can either be in the form of a manufacturing flow chart (preferred) or a simple listing.


Acceptance (in writing) by nLIGHT of the specified documentation will be considered as freezing the design and forming a configuration of the part being purchased. The Supplier's approved configuration document number, revision level and revision date must be reflected on the certificate of conformance provided by the Supplier with each delivery.

All changes to the approved configuration control document require nLIGHT approval. Changes must be sent to nLIGHT with a copy of the affected documents. A copy of the approved request for change will be sent to the Supplier (nLIGHT's goal is to do this within 2 to 3 workdays).


- 91. RESERVED FOR FUTURE USE
- 92. RESERVED FOR FUTURE USE
- 93. RESERVED FOR FUTURE USE
- 94. RESERVED FOR FUTURE USE
- 95. RESERVED FOR FUTURE USE
- 96. RESERVED FOR FUTURE USE
- 97. RESERVED FOR FUTURE USE
- 98. RESERVED FOR FUTURE USE
- 99. RESERVED FOR FUTURE USE

100. INSPECTION/TEST

- A. The Supplier must provide data with each shipment in accordance with the following requirements. The Supplier is required to notify and receive written authorization from nLIGHT, if deviations from the following criteria are desired, i.e. sampling, etc.
  - The Supplier must perform and record the results of mechanical and/or electrical test in accordance with the final acceptance criteria as specified in the applicable component specification/drawing, unless otherwise specified in the purchase order.
  - When final acceptance is not defined in the controlling documents, the Supplier must perform and record results of the mechanical and/or electrical tests that are considered part of the Supplier's process.
  - Variable data must be utilized for 100% of the end item acceptance parameters within a component specification or drawing. Attribute data must only be utilized to identify the condition. Use of critical control characteristics as part of an approved SPC Control Plan may be substituted for the 100% variable/attributes data.
  - Recorded data must be traceable to 100% of the devices inspected/tested. Traceability must be controlled through part serialization, tagging, or identification of individual unit packaging unless otherwise specified in the purchase order or specification/drawing.

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- 100% of the lot must be inspected/tested unless otherwise stated in the Purchase Order or component specification/drawing. When sampling is authorized, it shall be in accordance with ANSI/ASQ Z1.4 or MIL-STD- 105, with specific lot size, AQL, and sample size identified on each data sheet.
- B. This product requires acceptance testing. The Supplier must prepare a detailed Acceptance Test Procedure (ATP), encompassing all tests and test equipment required for in-process and/or final acceptance in sufficient detail to allow duplication of the test and results. The ATP shall provide: Equipment type, range, accuracy level, and calibration requirements (methods and frequency). ATP(s) requires nLIGHT's approval prior to the delivery of the first product or as required by the Purchase Order, drawing or component specification. The Supplier must certify all equipment used for acceptance testing of deliverable products on this Purchase Order, with concurrence by nLIGHT, prior to acceptance testing. Subsequent changes to the ATP(s) are subject to nLIGHT's approval prior to incorporation and use on deliverable product. Software or firmware used in test equipment shall be controlled.
- C. Actual measurement data or indication of pass/fail inspection/test results must accompany each shipment. The Supplier's format is acceptable but must reference the Purchase Order number, Supplier's name and/or independent laboratory's name, item part number, serial number and/or lot date code(s), and the date of the inspection/test. An authorized Supplier's representative must validate all submitted reports, by either an inspection stamp or a signature.
- D. The Supplier must obtain nLIGHT's approval of detailed plans and procedures for accomplishing all acceptance test required by the drawings and component specifications. Approval must be obtained prior to the Seller presenting hardware for acceptance. nLIGHT reserve the right to witness a demonstration of the procedures and equipment. The detailed plans and procedures will contain as a minimum:
- A list of all instrumentation, non-standard instrumentation calibration procedures, points of measurement and accuracy of measuring system.
  - Test conditions.
  - Test sequence.
  - Test Methods including a detailed step-by-step procedure of each test using instruments listed above.
  - Supporting data for critical parameters or special equipment, such as: error analysis, schematic diagrams and panel layouts, which are not necessarily part of the procedure, but are required to adequately evaluate the procedure, shall be submitted as supplemental information.
  - Sample data sheets.
  - Quantity of test samples.
    - 100% testing
    - Lot acceptance
  - Definition of lot
  - Determination of lot sample size
  - nLIGHT's approval must be obtained prior to Supplier's implementation of subsequent changes to the acceptance test plan.

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- nLIGHT approval of the test plan does not relieve the Supplier of the obligation of meeting all requirements as listed in nLIGHT's Purchase Order, drawings and/or component specifications.
- E. The Supplier must retain objective written evidence of hardware conformance to Purchase Order requirements for each shipment. Note: All evidence is subject to review and/or audit by nLIGHT at the Supplier's facility or at nLIGHT.

The following must be retained if it is generated during the build of the part(s):

- Any special selection test records
- Conditioning (burn-in) test records
- Lot acceptance test records
- Sampling test records or any other test records used to determine item conformance.
- Reports/certifications of chemical and/or physical analysis/test records that assure conformance to applicable specifications.


Note: Records/reports/certifications of chemical and physical analyses/tests are to be fully traceable to the drawings, component specification, the Purchase Order, item serial numbers and/or lot numbers, and any specific shipment identification.

If the Supplier is a distributor of the item(s) in this Purchase Order, the Supplier must require the same documentation from the original manufacturer of the item(s). Additionally, the Supplier must secure from that manufacturer a right for nLIGHT to acquire or inspect all pertinent data in that manufacturer's possession showing the items compliance to specifications.

The Supplier may obtain attributes data or variables data at their discretion unless variables data is specifically requested by nLIGHT. The Supplier's format is acceptable. At a minimum, attributes data must include the parameter inspected, the tolerance, and a summary of the inspection test results. The variables data must include the parameter inspected, the tolerance, and the measurement obtained for each item inspected.

Data sheets/test reports must bear evidence of acceptance by Seller's signature (or stamp) and date signed.

- F. Actual measurement data or test results (for those specific parameters identified as requiring data reporting in nLIGHT's drawing or component specification), must accompany each shipment. The Supplier's format is acceptable but must reference the Purchase Order number, Supplier's name and/or independent laboratory's name, item part number, serial number and/or lot date code(s), and the date of the inspection/test. An authorized Supplier's representative must validate all submitted reports, by either an inspection stamp or a signature.
- G. Any witness pieces (including plating coupons or other representative materials) required by nLIGHT drawing, PO or Component Specification must be retained for a time period consistent with the requirement of QAP 110 called out by the Purchase Order, or 5 years if QAP 110 is not called out in the Purchase Order. Witness pieces must be made available to nLIGHT on request.
- H. Data from witness pieces (including plating coupons or other representative materials) processed at the same time as nLIGHT product, must be provided with the shipped product
- I. RESERVED FOR FUTURE USE


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- J. RESERVED FOR FUTURE USE
- K. A copy of the Supplier's inspection measurements must accompany each shipment. The data must consist of individual measurements, not summary statistics such as the mean nor qualitative attributes such as pass/fail. The Supplier's format is acceptable but must reference the Purchase Order number, Supplier's name, item part number, serial number and/or lot date code(s), the date of the inspection, lot size and sample size.
  
- 101. RESERVED FOR FUTURE USE
- 102. RESERVED FOR FUTURE USE
- 103. RESERVED FOR FUTURE USE
- 104. RESERVED FOR FUTURE USE
  
- 105. nLIGHT SUPPLIED EQUIPMENT  
The Supplier is responsible for the appropriate control, storage, handling, calibration and usage of all inspection and production tooling or equipment furnished or owned by nLIGHT (or any of nLIGHT's Customers) for use in performance of purchase order requirements. The Supplier must not modify, revise or rework such tooling or equipment without the written authorization of nLIGHT.
  
- 106. nLIGHT SUPPLIED MATERIAL  
When material is furnished by nLIGHT, the Supplier's procedures must include, as a minimum:
  - (a) Examination upon receipt to detect damage in transit
  - (b) Inspection for proper item/material type and quantity
  - (c) Periodic inspection and precautions to assure adequate storage conditions and to safeguard against damage from handling and deterioration during storage
  - (d) Identification and protection from improper use or disposition
  
- 107. RESERVED FOR FUTURE USE
- 108. RESERVED FOR FUTURE USE
- 109. RESERVED FOR FUTURE USE
- 110. DOCUMENT RETENTION PERIOD
  - A. All records related to the manufacturing, testing and inspection of items supplied to nLIGHT must be maintained for a minimum of 3 years and made available upon request from nLIGHT's Buyer.
  - B. All records related to the manufacturing, testing and inspection of items supplied to nLIGHT must be maintained for a minimum of 5 years and made available upon request from nLIGHT's Buyer.
  - C. All records related to the manufacturing, testing and inspection of items supplied to nLIGHT must be maintained for a minimum of 7 years and made available upon request from nLIGHT's Buyer.

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D. All records related to the manufacturing, testing and inspection of items supplied to nLIGHT must be maintained for a minimum of 10 years and made available upon request from nLIGHT's Buyer.


<b>CHANGE HISTORY</b>					
<b>REV</b>	<b>DATE</b>	<b>ECO #</b>	<b>QAPs CHANGED</b>	<b>QAPs ADDED</b>	<b>QAPs DELETED</b>
01	7/1/11	3393	>-----INITIAL RELEASE-----<		
02	7/15/11	3453		56	
03	2/22/12	4043	D – waiver request approval changed from nLIGHT Quality to nLIGHT's Buyer 2 – Title changed from 'RoHS COMPLIANCE' to 'RoHS' 17A – revision added 56 – DFARS 252.225-7010 added 85A – first part of 85B (definitions) merged. Additional definition regarding "new" included 85B – heading added re. COTS parts. Section regarding unique parts deleted	46B – standards for no-clean solder materials 47E – laser threshold damage standard for optical coatings added 85C (new) – requirements for unique parts removed from 85B and given its own, standalone, section 100F – data to be provided as specified in nLIGHT drawing or component spec. 100G – requirement to retain witness samples	85C
04	9/29/12	4745	2 – Title changed from 'RoHS' to 'Restriction of Hazardous Substances (RoHS)' 2B – More detail added	3 – Conflict Materials	
05	2/18/13	5123	2B – requirement to include in CofC the method of determining compliance		

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CHANGE HISTORY					
REV	DATE	ECO #	QAPs CHANGED	QAPs ADDED	QAPs DELETED
06	8/14/13	5696	A – Supplier’s QMS ‘must be available for review’ rather than ‘must be approved’ A – access to facilities requirement removed A – Flow down requirement removed 2B – ‘...test standards must be used’ to ‘...test standards must be referenced.’ 85A – ‘...have been (re) marked...’ to ‘...have been marked or re-marked...’ 85A – ‘...and (D)...’ added	19 – Access to suppliers facilities 20 – Flow down of QAP A to suppliers	
07	5/2/14	6446	2B: clarified CofC requirements and relaxed requirements for COTS parts 27A: added detail to clarify requirement 100G: clarification of ‘witness samples’	16, 27D, 100H	
08	6/25/14	6585		4	
09	3/10/15	7332	Revise 2B to require statement of exemption number if only compliant by exemption	48	
10	5/4/16	20358	Add 85D for bulk materials	85D	
11	12/5/16	33723		100K	
12	11/11/17	35602	More hazardous substances added to 2B per European Directive 2015/863	5	
13	4/2/2018	36259	35 Added Serialization formats. 30 Added part marking on inside of part. 49 Add cosmetic standard reference.	49	
14	4/20/18	36342	Add 30E	30E	
15	5/11/18	36441	Add 50. Control Plan Requirements	50	

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16	6/11/18	ECO-036660	Add QAP 27 E-J. Modify QAP N, 27 B,C to add Country of Origin. Reword QAP R. Revise 35D to allow alpha-numeric SN	27 E- 27J	
17	11/12/18	ECO-037499	Add QAP 51 and 52	51, 52	
18	12/18/18	ECO-037678	Add QAP 53, Modify QAP 35D	53	
19	1/22/19	ECO-037838	Add QAP 30F	30F	
20	03/18/19	ECO-038041	Revise the content of QAP 35D and put "S" as prohibited letter		
21	4/18/19	ECO-038629	Revise wording for N, 2B, 30D. Add 35H, 85E. Remove 27 E-J	35H, 85E	27E-J
22	10/09/19	ECO-039100	Add QAP 35I for fiber serialization;	35I	
23	10/24/19	ECO-039236	44 Added for Post Plating Test Standard	44	
24	2/26/20	ECO-039834	Bring more clarity to QAP 44C regarding what /if heat test is needed	44C	
25	3/5/20	ECO-039901	27E added for environment-sensitive materials packaging requirement	27E	
26	8/13/20	ECO-040748	QAP H clarified that QAPs are included in the flow downs from nLIGHT's suppliers to their suppliers. QAP 5 simplified. QAP 6 added to allow the inclusion of QAPS such as 2, 3, 5, 85 etc. on COTS items. QAP 77 added to better define PCBA suppliers' management of nLIGHT-specified BoMs	6, 77	

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27	08/30/20	ECO-040961	Use low outgassing and low particulate packaging materials for element optics to prevent contamination from the packaging materials	Add 27F	
28	2/10/2021	Admin Rev	Revised footer, removed links from N, T, 49, 53		
29	7/9/21	ECO-042637	Revise QAP 30D		
30	08/06/2021	Admin Rev	Typo "not" error fixed 30 D. Part Marking		
31	12/7/21	ECO-043432	Add QAP 7 for TSCA (ECO-042658 missed to include this document), Update to 2B, 3 and 7 that a QAP certificate in the shipment Certificate of Conformance is not required	2B, 3, 7	
32	08/19/22	DMS Change	Add QAP 11 FAIR under AS9102	Add 11	
33	05/25/23	DMS Change	Update QAP 17A Add QAP 27G – Test Packaging	17A 27G	
34	06/05/23	DMS Change	Update QAP 85E	85E	
35	7/13/23	DMS Change	85A, 85B, 85C, 85D, 85E format and clarity. Enabled use of recycled material.		