I. Purpose
This document describes the methods or requirements mandatory to ensure compliance with the engineering requirements of the product(s) required under the Purchase Order to which this document is attached.

II. Definitions and Abbreviations
(Refer to ISO 9000:2000 Quality Management Systems – Fundamentals and Vocabulary for definitions.)
1) ATP – Acceptance Test Procedure  
2) DoD – Department of Defense  
3) LS – Laser Systems.  
4) OCM/OEM – Original Component Manufacturer/Original Equipment Manufacturer  
5) PO – Purchase Order  
6) NIST – National Institute of Standards and Technology  
7) NADCAP – National Aerospace and Defense Contractors Accreditation Program  
8) NG – Northrop Grumman  
9) LDD – Limited Dimension Drawing – a drawing or part whose dimensions and features are controlled via an electronic model. The model shall then be used for all dimensional and feature verification and validation without translation or interpretation.  
10) TSCA – Toxic Substances Control Action  
11) COTS – Commercial Off-The-Shelf

III. Revision Control
This document may undergo routine and periodic revisions. It shall be the supplier’s responsibility to obtain the most current revision from the OASIS website or from the procurement representative of the purchase order prior to proceeding with quotation or order fulfillment.  

IV. General Requirements
All components herein apply to all purchase orders. Also, refer to the applicable Terms and Conditions documents as incorporated to the purchase order.

A. UNAUTHORIZED REPAIRS:
Supplier shall 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, nor repair by any method, defects in castings or forgings, unless authorized by LS in writing utilizing the Supplier Deviation Process.

B. UNAUTHORIZED CHANGE IN LS APPROVED PROCESSES, MATERIALS OR PROCEDURES:
Suppliers shall not change any process, material or procedure without prior LS written approval, when the process, material, or procedure was originally approved by LS. This requirement shall be flowed down to sub tier suppliers used to complete this procurement activity.
C. PROPER SUBMITTAL OF DOCUMENTATION
Adequate records of inspections, test results, and certification documentation, shall be maintained throughout the manufacturing process by means sufficient to maintain traceability, security, integrity, and immediate access by the supplier. Documentation shall be supplied to LS upon request. Electronic submittal of documentation is preferred in either any Microsoft document format or Adobe Acrobat format.

D. PREVIOUSLY REJECTED PRODUCTS – REPAIRS, REWORKS, OR OTHERWISE
Previously rejected product that has been screened, reworked, repaired, or otherwise by the Supplier, shall be identified as such in the shipping documentation by referencing the original rejection documentation (NC number). The supplier shall indicate if material was screened, reworked or replaced. Reworked product shall be identified and segregated from new product. Failure to identify previously rejected product is cause for rejection and return of the material at the supplier’s expense.

E. SUPPLIER DEVIATION REQUEST (SDR)
Suppliers may request consideration of nonconforming product use for “Repair” or “Use-As-Is” (UAI) on a Supplier Deviation Request, for disposition by LS’s Material Review Board (MRB). A copy of the LS Approved SDR shall be added to the documentation package included with each shipment until the SDR quantity/terms have been satisfied. The minimum information necessary for a deviation request shall be:
- The Supplier Name and LS Supplier Number.
- The PO Number and PO Line Item Number.
- The Part Number and Revision
- The Total quantity requested for consideration [and Serial Numbers, if applicable]
- Discrepancy (a description of the current nonconformance(s)) and cause explanation
- The requested rework or repair and justification for such.
- Corrective and Preventive Actions to be implemented to prevent reoccurrence of the issue(s).

The request shall be submitted by a member of the supplier’s quality assurance staff.

F. SUPPLIER RATING SYSTEM
The Supplier Rating System is used to measure the effectiveness of the Supplier’s quality system and process control capabilities, with regard to product quality and delivery performance. The Supplier’s ratings are used by LS, to determine future procurement activity.

G. QUALITY PROGRAM REQUIREMENTS AND CALIBRATION SYSTEM
The Supplier shall establish and maintain a quality system to the requirements of ISO 9001, current revision, or an equivalent NG approved quality system. The Supplier’s calibration system shall be in accordance with the requirements of ISO 10012-2003, Measurement Management Systems or equivalent NG approved calibration system.

H. COMMERCIAL (CATALOG) ITEMS
First shipment on each PO or when there is a revision change to a COTS or MIL spec part, a copy of the associated drawing or spec sheet is to be supplied with shipment.
I. PART MARKING CLARIFICATIONS
When required on certain assembly or component drawings, physical part marking shall comply with the requirements of the print whereas the ‘applicable dash no’ is as described on the dash number section of the print typically at the bottom center of the drawing. The specific dash number is also identified on the purchase order but may contain additional suffix characters such as SP, L1, G1, etc, these suffixes are not to be physically marked on the parts. The packages, bags, boxes, or whatever conveyance method is utilized shall be marked with the full part number as described on the purchase order.

J. RoHS COMPLIANCE (LEAD FREE INITIATIVE)
Northrop Grumman has evaluated and determined that RoHS compliance is not desirable due to long term reliability concerns regarding lead free electronic or electrical assemblies, circuits, or components. Therefore, unless otherwise specifically stated on the engineering specifications, the following requirements are established:

- Soldering shall be in accordance with ANSI/IPC-J-STD-001, class 3:
  - Fluxes shall meet the requirements of J-STD-004 and J-STD-001
  - No-clean fluxes are prohibited unless specifically authorized by Northrop Grumman Laser Systems
  - ANSI/IPC-J-STD-005 and IPC/EIQ J-STD-006
- Solder material may be of any form or shape but must meet the requirements of the specifications listed above. Composition must be a minimum of 63% and 37% lead (Sn63 or Sn63/Pb37).
- The use of tin plating without lead (with or without other additives) should be avoided as a termination finish on procured parts unless there is no alternative. If tin without lead is the only alternative, it shall be matte tin per ASTM B545. Bright tin plating shall not be used.
- All fine pitch (reference IPC-T-50), all grid-array devices (to include BGAs and Pin Arrays, etc), and any device with an air-gap between leads of less than or equal to 0.010 inch are required to have finishes other than tin-only plated. When these finishes are not available in other than tin-only plate the finish shall be re-plated or re-balled required using a lead/tin finish.

V. QUALITY ASSURANCE PROVISIONS

1. DELETED

2. GOVERNMENT SOURCE INSPECTION
Government inspection of the purchased product is required, prior to shipment from the Supplier’s facility. Upon receipt of this PO, the Supplier shall promptly notify the Government Representative(s) who normally service the Supplier’s facility to establish a plan for Government Source Inspection. Government Source Inspection applies to prime (new materials) and returned materials (reworked or replaced for resubmittal).

2A. GOVERNMENT SELECTIVE EVALUATION
During the performance of this PO, the Supplier’s manufacturing related processes, products, and associated inspections and/or test data are subject to review, verification, examination, test, and/or analysis by an authorized government representative. Government inspection of purchased product, prior to shipment, is not required unless otherwise notified or QAP 2 is a requirement. A copy of the PO shall be furnished to the representative upon request.

3. CONTROLLED SPECIAL PROCESSES
The supplier is responsible to ensure that all Special Processes, performed either by the supplier or their subcontractor, are approved by NG and/or accredited by NADCAP. In addition to those processes defined and control by NADCAP, NG defines Optical Coating as an additional Special Process. Unless otherwise noted on the engineering drawing or specification, all
Electronic/electrical specification controls shall follow the IPC/J-STD series of documents for control and processing. Any detailed information regarding NADCAP accreditation process including the audit schedule can be obtained from Performance Review Institute (PRI) at http://www.pri-network.com/Nadcap/

Suppliers shall submit a complete listing of all sub-tier suppliers’ names, addresses, and the applicable Special Process(s) that the sub-tier supplier shall perform to satisfy the PO. This information shall be provided with the first article documentation package, to be delivered with the first shipment of material, or as otherwise defined in the procurement documentation. The supplier is required to notify LS if they or lower-tier Special Process suppliers change, modify their processes, or are no longer NADCAP certified to perform a required Special Process.

4. SOURCE INSPECTION

LS will perform final inspection and/or witness acceptance tests at the Supplier’s facility prior to shipment of product. The Supplier will notify LS’s Supply Chain only when parts are complete, inspected and accepted by manufacturers quality group and ready for LS inspection at a minimum of five (5) working days prior to date that Source Inspection is required, parts must be ready for inspection to avoid rescheduling. If LS waives a required source inspection, an approved inspection waiver shall accompany the shipment or the shipment cannot be accepted at LS. A copy of the inspection documentation shall accompany the shipment of product. Material returned to the supplier for rework or repair does not require additional source inspection activities; however, replacement product may require additional activities, therefore contact your procurement representative.

4A. IN-PROCESS SOURCE INSPECTION

Similar to QAP 4 above however LS will perform in-process inspection and/or witness acceptance tests at the Supplier’s facility prior to shipment of product. The supplier shall work with the Procurement Quality Engineer to determine a suitable hold point(s) for the in-process inspection. Material returned to the supplier for rework or repair does not require additional source inspection activities.

5. DELETED

6. DELETED

7. PRESEAL SOURCE INSPECTION

LS will perform pre-seal inspection, in accordance with applicable paragraphs of MIL-STD-883, Test Method Standards Microcircuits, Methods 2009, 2010, and 2017, as a minimum, or their demonstrated equivalents, at the Supplier’s facility.

8. SOFTWARE QUALITY ASSURANCE; LDD DRAWING REQUIREMENTS

The Supplier shall implement and maintain a Software Quality Assurance Program that conforms to the requirements of ISO-9003, AS9006, or NG approved equivalent system. When automated inspection/test equipment is utilized the software used for such operations shall be verified to perform its required function and is under configuration control. This system shall also encompass software, firmware, and/or gateware used to calibrate all instrumentation and gauging used in the manufacturing, inspection and test, and acceptance process(es).

8A. SOFTWARE QUALITY ASSURANCE; ELECTRONICS

The Supplier shall implement and maintain a Software Quality Assurance Program that conforms to the requirements of ISO-9003, AS9006, or LS approved equivalent system. The Supplier shall identify, to LS, any activity under this PO, which involves the initial development or modification of existing software, firmware, or gateware, as required by the product specific and program unique requirements.
9. CERTIFICATES OF CONFORMANCE, MATERIAL CERTIFICATION, AND PROCESS CERTIFICATIONS.

The Supplier shall submit a Certificate of Conformance (C of C) with each shipment, stating that the product(s) or services furnished on this PO conforms to the applicable specifications and requirements (i.e. quality assurance provisions, drawings, material, process, test specifications, T & Cs, etc.). The C of C shall include:

- Contract Purchase Order number.
- Part number and revision level.
- Quantity and if applicable, serial numbers.
- Manufacturer’s name and if applicable, manufacturer’s part number.
- Applicable date code or lot number.
- Statement that parts, materials, or services fully conform to the applicable drawings, specifications, and purchase document requirements.
- The Supplier shall document the Country of Origin on the C of C as required by 19 CFR 134.
- Attach Special Process Certification documentation.
- Date, signature, and title of authorized representative of the supplier.

When materials are provided by NG, the supplier shall furnish a signed certification addendum to the C of C stating that the items (itemize specific part numbers) supplied are materials furnished by NG. Provide a copy of the NG packing slip.

The Supplier shall maintain quality records to substantiate product compliance to the PO and must be capable of furnishing copies of these records immediately upon request of LS or LS’s customer representative(s).

For electrical and electronic components or assemblies the requirements of QAP 31 apply universally.

SPECIALTY METALS CLAUSE:

The line item(s) in this purchase order includes DFARS 252.225-7009 (OCT 2014). Paragraphs (c)(6) and (d) are hereby deleted. Unless specifically exempted through notation of this Purchase order, the requirements of DFARS 252.225-7009 (OCT 2014) apply to this purchase order and take precedence over any other specialty metals requirements, including but not limited to the Specialty Metals clause contained in any terms and conditions, or any purchase order notes. Upon Seller notification of noncompliance with the terms of this clause and provision of specific information related to the source of the noncompliance, Buyer will facilitate management of the allowance for up to 2% otherwise noncompliant specialty metal content in the end product. The 2% minimal content exception does not apply to and cannot be used to exempt specialty metals contained in high-performance magnets. Upon review of Seller’s information, Buyer will advise of the availability of the allowance.

Material that does not meet these specialty metals requirements must go through the Supplier Deviation Request process to obtain authorization for use.

10. CONTROL OF LIMITED SHELF-LIFE AND STORAGE CRITICAL MATERIALS

The material associated herein is deemed to require special controls to ensure its usability throughout the manufacturing cycle and beyond. Therefore all product certifications must include, as applicable: shelf life start date, expiration date, storage conditions, handling requirements, and lot/batch identification to include the material specification identification.

When storage temperature requirements other than ambient 25° ± 5° C are required, they shall be clearly marked on the outermost shipping container.

Items shall have a minimum shelf life remaining of 75% at time of receipt at NG facilities.

O-Rings, seals, and gaskets must meet the requirements of SAE ARP 5316, “Storage of Elastomeric Seals and Seal Assemblies”.

The information above shall be included in the documentation package provided with each shipment.
10A. MICROCIRCUIT /SEMI-CONDUCTOR AGE CONTROL
The Supplier shall not ship microcircuit devices or semiconductors, manufactured to military specifications, whose lot date code exceeds thirty (30) months at the time of LS receipt without prior written LS approval.

10B. SAMPLE MATERIAL CONTROL FOR O-RINGS, GASKETS, AND SEALS.
The supplier shall provide either 2 additional product samples or a sample piece of material in a 1” X 1” rough square shape to be included in a separate package included with the product submittal.

11. DELETED

12. PACKAGING
The Supplier is responsible to ensure that all items are preserved and packaged adequately to guarantee product integrity during shipment or transportation. The item(s) packaged within their primary individual packaging must also be capable of secondary distribution and handling while remaining in their original individual packaging. The parts shall be individual packaged (re-sealable zip-loc preferred instead of heat sealed when bagged) with label affixed to the outside of the package. The labels are to contain, at a minimum, the information as required by the engineering specification, drawing, or purchase order along with the PO number and revision, and must be presented on the label in readable text (If in addition barcodes are used, the format shall be Code 39 and shall meet the requirements of paragraph 5.2.3.1 of MIL-STD-130, bar code configuration.) If PO part number includes an “SP” suffix, do not include the “SP” in the part number on package labels. Do not use the label to seal the package or to cover the opening as the label must remain intact if package is opened for inspection. Bulk packing is allowed if approved by PO but they still must be packaged to prevent damage from shipping and handling.

Packing Slips: The purchase order number and part number(s) must be listed. It is preferred that this information also be provided in a barcode as described above.

The Country of Origin: Mark as required by 19 CFR 134.

COTS Items: Best commercial packaging is acceptable.
The use of “egg carton” or “waffle tray” type packaging is not permitted for NGC designed parts.
When shipping multiple part numbers or multiple PO numbers in the same shipping container, each shall be packed and identified separately to allow matching to packing slip QTY easily.

12A. PACKING; OPTICAL COMPONENTS SUPPLEMENT
All of the requirements of QAP Note 12 apply. Additionally, all optical products shipped under this PO shall be individually packaged to protect the component from contamination, damage, or mishandling per the engineering drawing specification or with use of alternate packaging. The preferred packaging method shall be lens tissue in sufficient layers to prevent contact damage; other methods may include membrane boxes of a suitable size and shape, cotton bags, individual plastic boxes with molded inserts, etc. The exception is COTS items. They do not have to be shipped individually packaged, but they still must be packaged to prevent damage from shipping and handling.

13. ACCEPTANCE TEST PROCEDURE
This product requires acceptance testing. The Supplier shall prepare a detailed Acceptance Test Procedure (ATP), encompassing all test characteristics, test equipment, and processes required for in-process and final acceptance. This requirement will assure conformance to all engineering requirements. The ATP shall provide; Equipment type, range, accuracy level, and calibration requirements (methods and frequency). Acceptance Test Procedure(s) require LS approval prior to the delivery of the first product or as required by the PO. The Supplier shall certify all equipment used for acceptance testing of deliverable products on this PO prior to acceptance testing on deliverable product. Subsequent changes to the ATP(s) are subject to LS approval prior to incorporation and use on deliverable product. If software or firmware is used in/with test equipment, its use shall require implementation of QAP 8.

13A. DELETED
14. TEST REPORTS
The supplier shall provide actual quantifiable test data or indication of pass/fail test results (when applicable). The Supplier’s format is acceptable but must be legible and shall reference the PO number, Supplier’s name and/or independent laboratory’s name, product number, serial number or lot date code(s), if applicable, and the date of the test. An authorized Supplier’s representative shall validate all submitted reports and signify such through approval.

14A. FLYING PROBE
The supplier shall perform flying probe test and provide the results on each fully populated CCA. Testing at a minimum shall include open/short diagnostics, resistance and capacitance, and impedance verification. Additionally, the supplier shall provide a test coverage report and test results with the first article sample(s).

15. CHEMICAL/PHYSICAL TEST REPORTS
The supplier shall provide actual chemical, physical, and/or mechanical test to substantiate the materials provided meet the requirements of the engineering drawing or specification. The tests shall be provided with the first article lot and then whenever requested thereafter but minimally whenever a lot of material is changed. The report shall contain the following information:
- PO Number.
- Item Number and material description.
- Quantity or Lot/Batch identification
- Itemized Results.
- Printed Name, Signature and Title of individual authorized to certify compliance.

16. RADIOGRAPHIC EXAMINATION OF MECHANICAL PRODUCTS
Radiographic inspection shall be performed. Radiographic examination for metallic and nonmetallic materials shall be in accordance with the engineering specifications or ASTM E1742. Laboratories and individuals performing this radiographic examination shall be qualified per ASTM E1742 and NAS410, and the supplier shall maintain evidence to support this. Individual radiographs shall be traceable to the corresponding product(s) and PO to which it applies.

16A. RADIOGRAPHIC EXAMINATION OF ELECTRICAL PRODUCTS
Radiographic examination shall be performed on semiconductor and hybrid devices in accordance with MIL-STD-883 Method 2012.7, IPC-A-610, J-STD-001, and IPC-7095. Laboratories and individuals performing this radiographic examination shall be qualified per ASTM E1742 and NAS410, and the supplier shall maintain evidence to support this. Individual radiographs shall be identified/traceable to the corresponding product(s) and PO to which each applies.

17. PRODUCT RE-SCREENING
Product(s) delivered under this PO may be subject to selected rescreening tests as described in the engineering specification(s). LS will not accept Product(s) that fail a rescreening test.

17A. LS PRESCREENED COMPONENTS OR MATERIALS
Only components or materials, which have been provided by LS, may be used to manufacture the products to be delivered under this PO, unless written approval has been obtained from LS.

18. CASTING FOUNDRY CONTROL
Unless otherwise specifically stated on the engineering drawing or specification, all castings shall adhere to the requirements of AMS2175 Class 3 Grade C. Zoned class control is implemented for all sealing surfaces and features defined to have a surface finish of better than or equal to a 16 finish such that these zones are controlled at a Grade B level.

a. RADIOGRAPHIC EXAMINATION
QAP Note 16 applies regardless of designation on the PO.
b. MECHANICAL PROPERTIES
The supplier shall prepare a test specimen and test it in accordance with ASTM B557.

c. CHEMICAL ANALYSIS
QAP Note 15 applies regardless of designation on the PO.

d. TEST CERTIFICATION
The Supplier shall furnish a test certification for each test performed as required by the material specification, engineering drawing, or engineering specification(s). The test certification shall include the product number, drawing revision, PO number, serial number(s), if applicable, and specifications to which the certification is made. An authorized Supplier’s representative shall validate all submitted test certifications.

e. DYE PENETRANT INSPECTION
Dye penetrant inspection and inspection reports shall be furnished with each shipment, unless QAP 9A is applied to this PO. The penetrant test report shall identify the procedure used, the acceptance criteria, part number, the results of the inspection, along with the signature of the person performing the inspection and the date of inspection.

19. ACCEPTANCE BY USER (INTERNAL USE BY LS)
Product(s) ordered under this PO will be inspected and accepted by the requestor to their requirements. The supplier shall maintain on file information relative to prove compliance of the product.

20. DELETED

GENERAL FIRST ARTICLE INSPECTION (FAI) INSTRUCTIONS
The Supplier’s First Article Inspection format shall include, as a minimum, the supplier name, PO number, product number, product name, revision level, drawing requirements (including tolerance), methods used to inspect each requirement, actual measured values (group ranges not allowed), pass or fail status when required, and any applicable notes or restrictions. Compliance with all other QAPs required by the PO shall be included as part of the FAI data. It is recommended that the supplier use the AS9102 format for clarity and consistency but this is not a requirement.
Occurrence of any of the following conditions shall require a delta or full FAI:
1) A material, design, tooling and/or process change(s) that affects the original first article inspection of the product. [DELTA FAI]

<table>
<thead>
<tr>
<th>TOTAL PO QUANTITY</th>
<th>MINIMUM FIRST ARTICLE LOT SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FROM 2 TO 25</td>
<td>2</td>
</tr>
<tr>
<td>26 TO 150</td>
<td>3</td>
</tr>
<tr>
<td>&gt;151</td>
<td>5</td>
</tr>
</tbody>
</table>

2) Product has not been delivered for a period of 18 months or longer. [FULL FAI]

3) A change in facilities has taken place (such as production machinery moved and reset, new machinery placed in the production process, a move to a new facility, as examples). [FULL FAI]

4) Damage and subsequent repairs to tooling, fixtures, dies, or support equipment used in the manufacturing process affects the specification parameters or attributes. [DELTA FAI]
Suppliers may have residual material left over from previous orders which is now desired to be provided. In order to submit such the suppliers shall provide traceability to these original deliveries and manufacturing lots. This allowance does not absolve the supplier from complying with current revision requirements. First Article sampling quantities shall be in accordance with the table below. The lot size shall be the initial total purchase order quantity. The FAI sample shall be samples which fully represent the manufacturing processes for the product.

21. FIRST ARTICLE INSPECTION AT THE SUPPLIER’S FACILITY
First Article Inspection (FAI) shall be validated at the supplier’s facility. The supplier shall perform the FAI per the General FAI Instructions above, prepare the complete documentation package to substantiate compliance, and then request validation by an authorized NG representative. The Supplier shall notify NG a minimum of five (5) working days prior to the anticipated date of validation to allow for scheduling. The supplier shall ship the completed documentation package with the product to NG upon acceptance.

21A. IN-PROCESS FIRST ARTICLE INSPECTION AT THE SUPPLIER’S FACILITY
Due to the complexity of the product or the procurement cycle for the product, a partial FAI is required to take place prior to the completion of the product. The exact point of performance shall be negotiated with Procurement Quality Engineering (PQE) and shall comply with the requirements of QAP 21 otherwise.

21B. QUALIFICATION TESTING BY SUPPLIER
Qualification testing per the engineering specification(s) is required on this PO. Qualification samples and all related test data shall be identified and packaged separately from the production product. When qualification testing has successfully been completed, burn in, and Group A and B electrical testing have been completed, these products may be shipped prior to completion of Group C and D inspection and test, when LS approval has been received.

22. FIRST ARTICLE INSPECTION AT A NORTHROP GRUMMAN FACILITY
First Article Inspection (FAI) shall be validated at an NG facility. The supplier shall perform the FAI per the General FAI Instructions above, prepare the complete documentation package to substantiate compliance, and ship the product and the complete documentation package to the NG facility.

23. ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) PRODUCTS
The supplier shall establish and maintain an Electrostatic Discharge Control Program in accordance with MIL-STD-1686, EIA JESD625-A, ANSI S20.20, or an equivalent standard. The supplier shall package ESD identified items as required and additionally, the inner most packaging material must completely enclose the items by a sealed static dissipative barrier material with ESD identification marking on the outside of the enclosure noting that the item is ESD sensitive.

24. GROUP “A” ACCEPTANCE TEST
Lot acceptance data shall reflect actual readings taken during test, or a check-off sheet when Go/No-Go type test equipment is used. Acceptance data sheets shall list the actual parameters tested in each case and shall accompany each First Article lot shipped as required by QAP 21/22. The data shall reference the product number, the PO number and lot date code(s), if applicable.

25. GROUP “B” ACCEPTANCE TEST
Environmental test or qualification test results shall list all parameters tested and actual readings taken during these tests, or a check-off sheet when Go/No-Go type test equipment is used. Group B test data shall accompany each First Article lot shipped as required by QAP 21/22. The data shall reference the product number, the PO number and lot date code(s), if applicable.

26. SUPPLIER FURNISHED OPTICAL WITNESS SAMPLE
A witness sample shall be provided of corresponding material type or matching index identified, traceable to the coating
run, properly packaged to prevent damage during shipment, and prepared in accordance with drawing 1037374. Do not include witness samples with general production parts, please package witness samples separately and clearly labeled as “Witness Sample”.

**Optical Coating Scans:**
An optical coating scan shall be completed on each witness sample to the engineering drawing requirements. The highest resolution scale shall be used, with the scale identified and legible. Scans for reflectance, transmission, or both, may be required on the specification. Each scan shall reference the PO number, the product number, and the lot control number.

26A. **LS FURNISHED OPTICAL WITNESS SAMPLE**
LS shall supply witness samples as needed for the PO. Otherwise comply with the requirements of QAP 26 above.

26B. **SUPPLIER FURNISHED OPTICAL COATING SCANS**
See QAP 26 above.

26C. **SUPPLIER FURNISHED OPTICAL TRANSMISSION WITNESS SAMPLE:**
See QAP 26 above.

27. **OPTICAL INSPECTION CRITERIA**
Products delivered hereunder shall be subject to optical quality and coating inspection in accordance with P708-GO012-APK. LS shall furnish a copy of any LS inspection requirement upon request.

28. **SERIALIZATION**
Each product furnished on this PO shall be identified by a unique serial number. Each serialized product shall be traceable to all inspection and/or test reports, and all other applicable.

29. **TOOL PROOFING**
Tooling used for this PO is subject to validation by NG prior to release for production. The Supplier shall notify NG when tooling is complete and ready for validation. Validation shall be to the requirements of the engineering specifications and the design of the tooling. A full FAI shall be performed per QAP 21/22 requirements.

29A. **DELETED**

29B. **DELETED**

30. **DOCK TO STOCK PROHIBITED**
This product shall not be considered for Dock To Stock (DTS) designation.

31. **OCM/OEM TRACEABILITY; ELECTRICAL, ELECTRONIC, AND ELECTROMECHANICAL COMPONENTS**
The Supplier is required to provide traceability from the OCM/OEM through all steps of the supply chain to the final point of consumption when installed on product for NG. The documentation proving traceability shall identify the name and location of all supply chain intermediaries and shall show the linkage through the supply chain (i.e. purchase order numbers and receipt data).

Non-franchised distribution or other third-party source certifications will not be accepted for traceability.

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. However, prior to submitting components for testing, the Supplier shall obtain concurrence from NG Mission Assurance using the SDR process. Once the SDR is approved, verification may start. Once verification is completed, all supporting documentation shall be submitted to the Procurement Quality Engineer for approval. Once approved then all the supporting documentation shall also be submitted including any test data shall be shipped with the material.
32. LOT CONTROL
Products furnished under this PO must be identified by the manufacturing lot or batch number. Where impractical to stamp or mark individual products due to size or shape, the lot or batch number and completion date shall be stamped or marked on identifying part labeling. All accompanying documents such as packing list or certifications shall include the lot control number and date.

33. HEAT TREAT SAMPLES
Supplier shall supply Furnace Charts that provide traceability to the material lot furnace run and the LS Purchase Order. Certification Charts shall be signed and supported by a Certificate of Conformance that comply with QAP 9.

34. TENSILE TEST SAMPLES
Two (2) separately cast test bars, coupons or appendages as defined by the applicable specification or LS drawing shall be submitted with each cast lot and shall be traceable to the material and PO.

35. FAILURE ANALYSIS REPORT
The Supplier shall perform failure analysis on product(s) returned under this PO and provide LS with a report within thirty (30) days or at the time of shipment of new or replacement product. The following information shall be included as a minimum:

- LS PO number, Item number, Serial Number (when applicable).
- NC Number and Date.
- Failure Mode(s), specific causes for failures with analysis to identify and quantify cause(s).
- Corrective Action prescribed to assure correction of the failures, with attention to recurrence control.
- Report signed, dated, with inspection stamp (when available) by an authorized Supplier representative.

36. LASER DAMAGE TESTING
The Supplier shall be responsible for the performance of Laser Damage Testing in accordance with P708-APK-G01 and shall test the coatings in the manner that they are designed to be used (i.e. a second side coating such as protected mirrors and some prisms shall be tested through the substrate). Alternate test methodologies modeled after ISO 11254 shall be submitted to LS for concurrence and approval, prior to implementation of testing. A test report shall be included with the first article inspection documentation. The supplier shall perform resistance testing to the requirements of the engineering specification. Additional resistance testing shall be performed as required by P708-APK-G01 or if any of the criteria of the FAI General Instructions section for re-submittal are met. As a minimum, all coating shall be tested for resistance annually. Review the table below for other constraints:

<table>
<thead>
<tr>
<th>COATING TYPE</th>
<th>MINIMUM PERIODICITY OF TESTING</th>
<th>TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Wavelength (AR)</td>
<td>Annually</td>
<td>Resistance</td>
</tr>
<tr>
<td>Dual Wavelength (AR)</td>
<td>Annually</td>
<td>Resistance</td>
</tr>
<tr>
<td>Complex (i.e. Dichroics, HRs, etc)</td>
<td>Each calendar Quarter or every 4 lots, whichever occurs first</td>
<td>Resistance</td>
</tr>
<tr>
<td>Critical Performance Optics</td>
<td>Every coating lot</td>
<td>Threshold</td>
</tr>
</tbody>
</table>

Review the table below for other constraints:
36A. DELETED

36B. CRITICAL PERFORMANCE OPTIC
This product has been identified as a “Critical Performance Optic” and as such, requires threshold testing in lieu of resistance testing (Reference QAP 36) with each deliverable lot. By default, all optics with a damage threshold of greater than or equal to 1 GW/cm² shall be designated Critical Performance Optics.

36C. DELETED

37. MATERIAL SAFETY DATA SHEET (MSDS)/ TSCA INFORMATION
The Supplier shall furnish a copy of the MSDS for each chemical and/or TSCA covered P/N with the first shipment of product under this PO. Upon receipt, the items validated to the current TSCA inventory before acceptance.

38. MAGNET PACKAGING
Magnets delivered under this PO shall be individually packed and shipped in double membrane boxes, or an LS approved equivalent container. Supplier shall not ship, nor will LS accept magnets that are not packaged in accordance with this requirement.

39. DELETED

40. SOLDERABILITY REQUIREMENTS
The solderability of the component leads shall be tested per the Supplier’s specifications. The Supplier shall submit their solderability test data or solderability certification, which shall include the date on which the parts were solder dipped. Parts may be subjected to solderability verification testing at LS's facility. LS will not accept product solder dipped in excess of 12 months, unless otherwise approved in writing.

41. USE OF RADIOACTIVE MATERIAL IN OPTICAL ELEMENTS
No optical element shall contain Thorium or any other added radioactive material (as defined in 10 CFR 40) in excess of 0.05 % by weight when MIL-O-13830 or MIL-PRF-13830 is referenced on the specification or PO. In any case, the thorium content of any finished optical element shall not exceed 30 % by weight of the element (10 CFR 40.13 (7)). When providing optical elements to LS that contain Thorium or other source material, the supplier shall furnish a Thorium Content Statement with each shipment with the following information:

1. Purchase Order Number,
2. Part Number,
3. Coating Lot Number, and
4. The Calculated Thorium content including supporting calculations used to determine percentage of content. This verification document shall be provided separately to any and all other certificates, documentation, and inspection requirements, and shall be addressed to the LS Radiation Safety Officer.

42. MATERIAL COUPON
The Supplier shall submit a material coupon or slug for verification of material, by LS. The coupon or slug must be from the same material that was used for fabrication of the product.

50. DELETED
60. SPECIAL INSPECTION REQUIREMENTS
Special inspection procedures, instructions, or requirements exist for this part. These requirements could exist as procedure guidelines, specific inspection criteria, or common inspection criteria. These quality requirements will clarify the specification requirements for the product to assure the specification requirements are met. PQE will establish these requirements/instructions and forward to SCM and RI. Contact your SCM Representative for further information and QAP 60 requirements documentation when QAP 60 is imposed on the PO.

61. DELETED