



PT&P Quality Assurance Provisions

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. Please note that provisions identified by letter under “General Requirements”, apply all the time, while the ones identified by number apply selectively as stated on each Purchase order Line.

II. Definitions and Abbreviations

(Refer to ISO 9000:2015 Quality Management Systems – Fundamentals and Vocabulary for definitions.)

- 1) ATP – Acceptance Test Procedure
- 2) DOD – Department of Defense
- 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
- 12) PT&P – Precision Targeting and Protection
- 13) FAI – First Article Inspection

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.

(<https://cdn.northropgrumman.com/-/media/Supplier-Documents/Quality-Documents/PTPQAP>)

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.

Please note that all the provisions under this section, apply all the time.

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 PT&P in writing utilizing the Supplier Information Request Process (refer to QAP Note E).

B. UNAUTHORIZED CHANGE IN PT&P APPROVED PROCESSES, MATERIAL OR PROCEDURES

Suppliers shall not change any process, material, or procedure without prior PT&P written approval, when the process, material, was originally approved by PT&P. This requirement shall be flowed down to sub tier suppliers

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used to complete or procedure 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 ascertain compliance to all Purchase Order requirements and also maintain traceability, security, integrity, and immediate accessibility. The supplier shall retain this documentation on file for a minimum of 7 years after the PO's last delivery, unless otherwise specified. Documentation shall be supplied to PT&P 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, replaced or otherwise fixed by the supplier, shall be noted as such in the Certificate of Compliance. The supplier shall reference the NC number, and indicate if material was screened, reworked, repaired, or replaced. Return 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 INFORMATION REQUEST (SIR)

Suppliers may need (a) additional information or clarification, (b) relief from specific technical or quality requirements, or (c) to request consideration of nonconforming product.

In all three cases they must complete a Supplier Information Request (SIR) via Form [Q32500-01-MSF](#).

For parts shipped under an approved SIR, a copy of the SIR, or the corresponding Nonconformance Document, must be included in the documentation package coming with the parts.

For additional details on how to proceed, contact your assigned Buyer or Subcontract Administrator.

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 PT&P, 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. DELETED

I. PART MARKING CLARIFICATIONS

When required on certain PT&P 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 L1, G1, etc., these suffixes are not to be physically marked on the parts. The packages, labels, bags, boxes, or whatever conveyance method is utilized shall be marked with the full part number as described on the purchase order, except if the suffix is "SP", in which case it should not be used on the labels.

J. RoHS COMPLIANCE (LEAD FREE INITIATIVE)

Northrop Grumman has evaluated and determined that RoHS compliance is not desirable due to long term

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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 PT&P ➤ 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 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 is required using a lead/tin finish.

K. PRODUCT RE-SCREENING

Product(s) delivered under this PO may be subject to selected rescreening tests as described in the engineering specification(s). PT&P will not accept Products(s) that fail a rescreening test.

L. GENERAL WORKMANSHIP AND FOREIGN OBJECT DAMAGE (FOD) CONTROL REQUIREMENTS

Delivered assembled equipment having missing, inoperative, defective, bent, broken, or otherwise damaged parts will not be accepted. Screws, nuts and bolts shall show no evidence of cross threading, mutilation, or detrimental or hazardous burrs.

Unless otherwise stated in the controlling specification(s), after fabrication, delivered parts and assembled equipment shall be cleaned of smudges and fingerprints; sand and dust; lubricating oils and waxes; loose, spattered, or excess solder; solder fluxes and any other corrosive products; weld material and metal chips; mold release agents; and any other foreign material which may detract from the intended operation, function, or appearance of the parts or assembled equipment. This would include any particles that could loosen or become dislodged during the normal expected life of the delivered part or assembled equipment. All corrosive material shall be removed. Cleaning processes shall have no deleterious effect on the delivered parts or assembled equipment.

The supplier's processes supporting the delivery of parts and assembled equipment shall utilize effective FOD prevention practices. The FOD prevention practices shall be proportional to the sensitivity of the design of the delivered parts and assembled equipment to FOD, as well as, to the FOD generating potential of the Supplier's methods utilized to manufacture and deliver the parts and assembled equipment.

M. SCARs/CARs General Response Requirements

Upon receipt of SCAR/CAR Notification Letter, Seller shall provide and maintain a corrective action and disposition program for nonconforming materials using NGC-SPM-8D, 8D Problem Solving Form with letter response, found in <https://www.northropgrumman.com/Suppliers/Contracts/Forms> by searching out "8D". Supplier exceptions to completing NGC-SPM-8D, 8D Problem Solving Form, shall be requested from Seller in writing to Buyer and approved by Buyer's Supplier Quality representative. Approval should be attached to the SCAR or CAR in SAP.

V. QUALITY ASSURANCE PROVISIONS (QAP)

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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 material) and returned material (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

This note only applies to NG part numbers.

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 control 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 <https://www.p-r-i.org/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, or as otherwise defined in the procurement documentation. The supplier is required to notify PT&P if they or lower-tier Special Process suppliers change, modify their processes, or are no longer NADCAP certified to perform a required Special Process.

Material and finish process certifications should be provided with every shipment. If the documentation includes serial numbers, they must match character by character the serial numbers on the actual parts, if applicable.

4. SOURCE INSPECTION

PT&P will perform final inspection and/or witness acceptance tests at the supplier's facility prior to shipment of product. The supplier will notify PT&P's Supply Chain only when parts are complete, inspected and accepted by manufacturers quality group and ready for PT&P 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 PT&P waives a required source inspection, an approved inspection waiver shall accompany the shipment, or the shipment cannot be accepted at PT&P. 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 actions. If so, please make sure to contact and coordinate with your procurement representative.

4A. IN-PROCESS SOURCE INSPECTION

Similar to QAP 4 above, however, PT&P 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.

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5. DELETED

6. DELETED

7. DELETED

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 9001, 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 gate ware 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 9001, AS9006, or PT&P approved equivalent system. The Supplier shall identify, to PT&P, any activity under this PO, which involves the initial development or modification of existing software, firmware, or gate ware, 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. When the documentation includes serial numbers, they must match character by character the serial numbers on the actual parts, if applicable.
- Manufacturer's name and if applicable, manufacturer's part number.
- Applicable date code or lot number. In the event of multiple date codes or lot numbers, use the manufacturer one.
- Statement that parts, material, 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.
- Date, signature, and title of authorized representative of the supplier.

Material and finish process certifications should be provided with every shipment.

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 material 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 PT&P or PT&P's customer representative(s).

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 the original deliveries and manufacturing lots and state it in the Certificate of Conformance. This allowance does not absolve the supplier from complying with the PO revision requirements.

The Certificate of Compliance must also comply with the requirements of Note D.



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For Chemicals

The Manufacturer's C of A (Certificate of Analysis) will be accepted in lieu of a C of C if the part # and Lot/Batch identification is traceable back to the vendors packing slip. SHELF-LIFE/Warranty Period information shall be per. QAP 10 requirements.

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 metal requirements, including but not limited to the Specialty Metal 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 metal 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 metal requirements must go through the Supplier Information Request process to obtain authorization for use (refer to QAP Note E).

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

The material associated herein is deemed to require special control to ensure its usability throughout the manufacturing cycle and beyond. Therefore, all product certifications must include, as applicable: date of manufacturing (DOM), shelf life start date, expiration date, shelf-life length or warranty period, storage conditions, handling requirements, and Manufacturers lot/batch identification. When storage temperature conditions other than ambient $77^{\circ} \pm 9^{\circ} \text{ F}$ ($25^{\circ} \pm 5^{\circ} \text{ C}$) are required, they shall be clearly marked on the outermost shipping container. Items shall have a minimum shelf life or warranty period remaining of 60% 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. DELETED

10B. SAMPLE MATERIAL CONTROL FOR O-RINGS, GASKETS, AND SEAL

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.

10C. MOISTURE SENSITIVE MATERIALS

Parts shall be packaged and stored in moisture barrier bags with desiccant, until assembled. Labeling and packaging shall comply with J-STD-020 & J-STD-033.

11. DELETED

12. PACKAGING

NG Part Numbers

The supplier is responsible to ensure that all items are preserved and packaged adequately to guarantee product

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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-lock 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, Part 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 the part number on the PO is an PT&P part number and it includes an "SP" suffix, do not include the "SP" on the individual package labels. If the individual labels include serial numbers, they must match character by character the serial numbers on the actual parts, if applicable.

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.

The use of "egg carton" or "waffle tray" type packaging is not permitted for NGC designed parts.

Packing Slips: Shall be included with shipment and shall list the purchase order number and part number(s). It is preferred that this information also be provided in a barcode as described above.

COTS Items: Best commercial packaging is acceptable, provided that the bulk package is clearly labeled with PO number and the quantity.

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 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 PT&P 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 PT&P 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

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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 material 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 material shall be in accordance with the engineering specifications or ASTM E1742. Laboratories and individual 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 individual 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 (DELETED. SEE LETTER K)

17A. DELETED

18. CASTING FOUNDRY CONTROL

Unless otherwise specifically stated on the engineering drawing or specification, all castings shall adhere to the requirements of AMS2175A 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.

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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. 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 PT&P)

Product(s) ordered under this PO will be inspected and accepted by the requestor to their requirements. The supplier shall maintain on file all information necessary to prove compliance of the product.

20. CALIBRATION CERTIFICATION

Calibration CERT required.

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 "Addendum to First Article Inspection (FAI) Instructions" below and AS9102, 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 use Net-Inspect to document NGC FAIRs and include the approved Form 1 with the FAI shipment. First Article Inspection forms 1, 2, 3 shall be fully populated per AS9102 including upload of all supporting documentation. See also the "ADDENDUM TO FIRST ARTICLE INSPECTION".

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. See also the "ADDENDUM TO FIRST ARTICLE INSPECTION".

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 PT&P approval has been granted.

See also the "ADDENDUM TO FIRST ARTICLE INSPECTION".

22. FIRST ARTICLE INSPECTION AT A NORTHROP GRUMMAN FACILITY

NGC has standardized First Article Inspections (FAIs) utilizing the Net-Inspect tool for FAI reports (FAIRs). Suppliers shall use Net-Inspect to document NGC FAIRs and. First Article Inspection forms 1, 2, 3 shall be fully populated per AS9102 including upload of all supporting documentation.

Use of Net-Inspect is only required when submitting a New FAI or New Delta FAI. If an FAI/Delta FAI package was

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previously submitted and approved, it does not need to be uploaded to Net-Inspect until a New FAI or New Delta FAI is triggered per the requirements of AS9102.

When submitting a Delta FAI to net-inspect, the full FAI package referenced in the Delta FAI shall be included as an attachment to the Delta FAI if it has not already been submitted into Net-Inspect.

Suppliers are responsible for obtaining access to and training employees on the use of Net-Inspect. Note: there is no cost for NGC suppliers or sub-tier suppliers to use the Net-Inspect tool to support NGC FAIRs.

Access the Net-Inspect FAIR repository by using the following link: www.Net-Inspect.com.

Training is accessible by using the following link: Net-Inspect.zendesk.com.

When suppliers are required to perform FAI and create a FAIR, the supplier shall not ship hardware (e.g., parts, materials, assemblies) associated with the FAIR to NGC until NGC has approved the FAIR in Net-Inspect and authorized shipment. Refer to applicable Supplier Quality assurance requirements for on-site or virtual NGSI requirements.

When a supplier is unable to submit FAI through Net-Inspect, suppliers may contact their assigned Northrop Grumman Buyer or Supplier Quality Representative to request an alternate method for submission. The alternate method must be approved in writing by Northrop Grumman prior to submission outside of Net-Inspect.

For additional information, contact your assigned Northrop Grumman Buyer or Supplier Quality Representative.

ADDENDUM TO FIRST ARTICLE INSPECTION (FAI) INSTRUCTIONS

The supplier's First Article Inspection shall be submitted through Net-Inspect and follow the AS9102 format. Compliance with all other QAPs required by the PO shall be included as part of the FAI data. First Article pcs. shall be identified to separate.

Occurrence of any of the following conditions shall require a delta or full FAI:

- a) Any change on material, design, tooling, process or revision that affects the original First Article inspection of the product. **[DELTA FAI]**
- b) Product has not been produced for a period of 24 months or longer. **[FULL FAI]**. This 24 month period applies globally to the whole of Northrop Grumman. This means that to have a gap, a particular part must have not been produced for any campus within Northrop Grumman for 24 months. As an example, if a part has a 26 month gap in production for PT&P; but the same part has been produced for another Northrop Grumman campus within the last 24 months, then, there is no gap and, therefore, no new FAI is required. When this rule is invoked, however, the C of C must include the campus where the parts were delivered as well as the date when the parts were produced and the PO number.
- c) 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]**
- d) 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 the original deliveries and manufacturing lots. This allowance does not absolve the supplier from complying with current revision requirements and residual material deliveries do not count as "production" when determining production gaps. The FAI sample shall fully represent the manufacturing processes for the product, be identified and delivered with the First Article lot.

23. ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) PRODUCTS

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The supplier shall establish and maintain an Electrostatic Discharge Control Program in accordance with MIL-STD-1686, JESD625, ANSI/ESD 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

The witness sample and substrate shall be the same material as the part is being made for, 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.

When this requirement is applied to metal parts with reflectivity requirements:

- a) A witness sample different from drawing 1037374 may be used, as long as it is approved by the corresponding Engineering authority (contact the buyer for additional information).
- b) A scan is not mandatory if the reflectivity is certified by an outside certified laboratory.

26A. PT&P FURNISHED OPTICAL WITNESS SAMPLE

PT&P shall supply witness samples as needed for the PO. Otherwise comply with the requirements of QAP 26 above.

26B. DELETED

26C. DELETED

27. OPTICAL INSPECTION CRITERIA

Products delivered hereunder shall be subject to optical quality and coating inspection in accordance with [P708-APK-GO012](#). PT&P shall furnish a copy of any PT&P 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 documentation. Once assigned, if a

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serialized item is scrapped its serial number shall not be re-used.

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. DELETED

31. OCM/OEM TRACEABILITY; ELECTRICAL, ELECTRONIC, AND ELECTROMECHANICAL COMPONENTS

The following requirements apply to Sellers providing electrical, electronic, or electromechanical (EEE) parts as defined by SAE AS5553, or assemblies containing EEE parts under this order. These requirements do not apply to the original manufacturer of an EEE part being delivered under this order.

1. Seller shall maintain an effective counterfeit protection plan that meets the applicable requirements of AS5553, DFARS 252.246-7007, and DFARS 252.246-7008. The plan shall document processes for (a) ensuring that only authentic and conforming material is procured, and (b) risk mitigation, disposition and reporting in the event counterfeit material is encountered in its supply chain.
2. Seller shall notify PT&P in writing when the source of supply of the EEE part is neither the original manufacturer nor a manufacturer-authorized source, or if the Seller is not capable of providing traceability back to the original manufacturer for the EEE parts they are supplying.
 - a. Prior to use of such EEE parts, Seller shall obtain concurrence from PT&P Mission Assurance using the SIR process (see QAP Note "E", Ref. Form [Q32500-01-MSF](#)).
 - b. If use of such EEE parts is authorized by PT&P, the following verification of authenticity shall be performed:
 - i. For EEE parts being delivered to PT&P, supplier shall have all authenticity validation tests and inspections performed per SAE AS6171 Moderate Risk Level Model 2 prior to shipment to PT&P or as otherwise specified by the PT&P PO;
 - ii. For assemblies containing EEE parts being delivered to PT&P, the Seller shall subject such EEE parts with inadequate traceability or from unauthorized sources to a verification of authenticity process in accordance with the Seller's counterfeit protection plan or as otherwise specified by the PT&P PO.
 - c. PT&P reserves the right to specify or disapprove the use of any facility for authenticity testing. Once verification is completed, all supporting documentation shall be submitted to the PT&P 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.
3. Seller shall have a process for screening credible sources of counterfeiting information and communicate issues or concerns to their supply base as appropriate. The process must include the screening of suspect counterfeit alerts in the Government Industry Data Exchange Program (GIDEP).
4. Seller shall ensure that all occurrences where it has:
 - a. Acquired suspect counterfeit parts related to the Buyer's purchase order are reported to GIDEP in a timely manner.



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- b. Identified suspect counterfeit parts related the Buyer's purchase order are immediately reported to the Buyer.
- 5. Seller shall respond to any suspect counterfeit inquiries made by PT&P regarding the authenticity of products provided by the Seller.
- 6. Seller shall take preventive actions on all suspect counterfeit parts and take corrective actions as appropriate.
- 7. Seller shall impose applicable contractual requirements on all tiers of its supply chain.
- 8. Seller shall make records available, as necessary to support audits and inquiries.
- 9. Seller shall provide PT&P and PT&P’s customer access to its facilities and the facilities of any sub-tier distributor, to verify compliance with PT&P PO requirements.
- 10. Seller shall maintain control for electrostatic discharge (ESD) and moisture sensitivity, as applicable, which comply with ANSI-ESD S20.20 and JEDEC-STD-033, respectively, unless the PT&P purchase order or Engineering requirements specifies other ESD and moisture control.

32. DELETED

33. HEAT TREAT SAMPLES

Supplier shall supply Furnace Charts that provide traceability to the material lot furnace run and the PT&P 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 PT&P 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 PT&P 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:

- PT&P 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 PT&P 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:

COATING TYPE	MINIMUM PERIODICITY OF TESTING TYPE	
Single Wavelength (AR)	Annually	Resistance



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Dual Wavelength (AR)	Annually	Resistance
Complex (i.e. Dichroics, HRs, etc.)	Each calendar Quarter or every 4 lots, whichever occurs first	Resistance
Critical Performance Optics	Every coating lot	Threshold

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. SAFETY DATA SHEET (SDS)/ TSCA INFORMATION

Unless previously provided already, the supplier shall furnish a copy of the SDS for each product supplied under this PO, including its TSCA status.

38. MAGNET PACKAGING

Magnets delivered under this PO shall be individually packed and shipped in double membrane boxes, or a PT&P approved equivalent container. Supplier shall not ship, nor will PT&P 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 PT&P’s facility. PT&P 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 or Uranium content of any finished optical element shall not exceed 10% by weight (10 CFR 40.13 (7)). [For optical elements manufactured before 8-27-13, the limit is set at 30% of Thorium by weight]. When providing optical elements to PT&P 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 PT&P Radiation Safety Officer.

42. MATERIAL COUPON

The supplier shall submit a material coupon or slug for verification of material, by PT&P. The coupon or slug



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must be from the same material that was used for fabrication of the product.

43. SHIPPING DOCUMENTATION INSPECTION CHECKLIST

The vendor is required to include a completed and signed copy of the Shipping Checklist Form PT&P-QAP-01. Failure to provide the completed checklist may result in delayed processing, non-compliance issues, and potential rejection of the shipment. The checklist must be visibly attached to the outside of the package or included with the packing list.

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.

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Shipping Documentation Inspection Checklist

- ☐ Packing Slip
 - ☐ Purchase Order
 - ☐ Part Number
 - ☐ Quantity
- ☐ Certificate of Conformance (COC) or Certificate of Analysis (COA)
 - ☐ Purchase Order
 - ☐ Part Number & Revision
 - ☐ Quantity
 - ☐ Serial or Lot Numbers
 - ☐ RMA or QN/NC number (per QAP General Requirements) (if applicable)
- ☐ Quality Assurance Provisions (QAP) Notes
 - ☐ Ensure all QAP notes are met
 - ☐ eSIR if applicable
 - ☐ Source inspection report (if applicable)
- ☐ Test Reports (if applicable)
 - ☐ Ensure correct part number
 - ☐ Data is conforming per specification
 - ☐ Witness Samples (if applicable)
 - ☐ Serialization
- ☐ First Article Inspection (Net Inspect)
 - ☐ Ensure latest revision is approved
 - ☐ Material Certification
 - ☐ Finish Certification
 - ☐ Required Test Reports
 - ☐ Hardware Certifications
 - ☐ Net-Inspect waiver Form Q32100-01-MSF (if not submitting in Net-Inspect)
- ☐ Labels
 - ☐ Purchase Order Number
 - ☐ Part Number (**Check print for cage code 34860, this must be included on labels if referenced on the print**)
 - ☐ Revision
 - ☐ Quantity
 - ☐ Serial Number (If applicable)
 - ☐ Ensure Drawing Requirements

Note: Ensure checklist and all required documentation has been packaged per requirements.

Completed By: _____ Date _____

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