

1.0 Purpose

- 1.1 This procedure is intended to establish a standard and efficient method for ensuring the incorporation of all applicable quality requirements on Purchase Requisitions and Purchase Orders.

2.0 References / Applicable Documents

SOP-74 Procurement Process

3.0 Responsibilities

- 3.1 **Quality Engineering** shall be responsible for ensuring the applicable Quality requirements are contained on L3Harris Technologies, Inc., Narda Microwave-West's (NMW) purchasing documents prior to their issuance. Quality Engineering shall base the specified Quality Clauses upon a thorough review of the part-specific requirements, as well as contractually imposed customer requirements. As indicated in the Procurement Process Procedure, SOP-74, Group 1, Group 2 or Group 3 designations are assigned to all drawing/specifications for purchased and fabricated parts, subassemblies and assemblies. The assigned group (1, 2 or 3) and Quality Clause Code (A through T and GRP3) as applicable are permanently attached to the part number in NMW's Visual MRP system, and are printed on the Purchase Order each time that part is ordered. Although Purchase Orders are subject to periodic audits, the above described system is intended to satisfy the requirement for reviewing all Purchase Orders.
- 3.2 **Material Control** shall be responsible for ensuring that all Purchase Orders provided to suppliers contain the assigned purchase group (1,2,3), and Quality Clause Code for Group 1 and 2 purchases. Furthermore, Material Control shall be responsible for ensuring Suppliers have and understand the definitions of the current and applicable Quality Clause Codes.
- 3.3 **Suppliers** are responsible for compliance to all Quality Clauses contained on the NMW purchasing document. It is the supplier's responsibility to request clarification of codes, clauses or any requirement that is not fully understood. A failure to comply with all Quality Clauses, even when the material conforms to the latest Engineering drawing requirements, shall be sufficient cause for rejection. Unless specifically stated in the Purchase Order, the Supplier is not granted MRB authority; all use-as-is and repair dispositions shall be submitted to NMW for review and approval prior to implementation.

- 3.4 The supplier is responsible for maintaining an acceptable Quality Rating in both Acceptance Quality Level (AQL) and On-Time Delivery.
Supplier DPPM – L3Harris captures this metric in three parts, instead of a single score). L3Harris captures a monthly value for the following, as they related to this metric:

Defects: The actual defect count

Population: The total part count

Composite Score: The DPPM calculation

- 3.4.1 AQL will be measured in Defective Parts Per Million (DPPM). To calculate DPPM use the following formula:

$$\text{Parts Rejected} / \text{Parts Received} \times 1,000,000$$

- 3.4.2 The table below defines the rating used. Suppliers are expected to meet the Gold Standard each month.

DPPM	Rating
≤ 1500	Gold
1501 to 45000	Green
45001 to 60000	Yellow
≥ 60001	Red

- 3.5 To meet the Gold standard (Goal), the supplier must assure that no material is shipped to NMW that does not meet all drawing requirements.
- 3.6 The supplier is responsible for maintaining an acceptable On Time Delivery (OTD) of 96%.
- 3.6.1 OTD will be measured by Purchase order promise date plus 3 days.

4.0 Quality Clause Codes

Quality Clauses shall be specified on procurement documents using either a single alpha character Quality Clause Code or a listing of the actual Quality Clauses defined herein. Table 1 below provides a cross reference between the Quality Clause Codes, the Quality Clauses that apply to each code, and a general category or description of the types of parts, materials or services procured.

Quality Clause Codes	Quality Clauses	Types or Categories of Procured Parts, Materials, or Services
A	Q5,Q12,Q14,Q35,Q40,Q41Q50,Q65,Q80, Q90	Machined Parts (un-plated), Connectors, and Discrete Components
B	Q5,Q12,Q14,Q35,Q40,Q41,Q50,Q65,Q80, Q90	Machined Parts (plated), Metallized Substrates and Circuit Boards
C	Q5,Q11,Q14,Q40,Q50,Q65,Q80, Q90	Plating Only, and other Special Processes
D	Q5,Q12,Q14,Q30,Q40,Q50,Q65,Q80	Hardware, wire
E	Q5,Q12,Q14,Q15,Q24, Q35,Q40,Q41,Q50,Q58, Q65,Q80, Q90	Space Qualified Discrete Components
F	Q5,Q12,Q14,Q30,Q43,Q50,Q65,Q80	Paints, Epoxies, Adhesives, etc.
G	Q5,Q14,Q42,Q50,Q65,Q80	Raw Materials
H	Q5,Q14,Q20,Q24,Q35,Q40,Q55,Q56, Q58,Q65,Q80	Test Laboratories
J	Q14,Q23,Q35,Q40,Q50,Q58,Q65,Q70,Q71	Calibration Services
K	Not Pre-determined	All Group 1 and those Group 2 orders designated by Quality Engineering at time of order
L	Q5,Q10,Q14,Q20, Q35,Q40,Q41,Q42, Q50,Q65, Q80,Q90 Add Clauses Q15, Q24, and Q58 for discrete (EEE) components	Parts or materials requiring actual physical/chemical analysis reports identifying the manufacturer's lot shall be delivered with each lot.
M	Q2, Q12, Q14, Q21, ,Q35, Q39, Q41, Q80, Q90, Q91	Major subassemblies, (e.g., DC/DC Converters, TCXOs, etc.
T		Machined/Assemblies Material Traceability. No restrictions on second operations special processes, ie. Plating, brazing, heat treat
Grp3	Q13, Q30, Q38, Q50, Q65, Q80	GRP 3 Parts and Material

TABLE 1

**THE FOLLOWING CLAUSES ARE APPLICABLE ONLY AS NOTED ON THE PURCHASE ORDER, EITHER BY QUALITY CLAUSE CODE OR ITEMIZED QUALITY CLAUSES:
SOURCE INSPECTION REQUIREMENTS**

Q-1 NASA - All work on this order is subject to inspection and test by the Government at any time and place. The Government Quality Representative who has been delegated NASA Quality Assurance functions on this procurement shall be notified immediately upon receipt of this order. The Government Representative shall also be notified forty-eight (48) hours in advance of the articles or materials being ready for inspection or test.

Q-2 NMW Source Inspection - All Work under this purchase order shall be subject to NMW inspection and test at all times (during the period of performance) and places; and, at any event up to and including final acceptance. The NMW Quality Department shall be notified forty-eight (48) hours in advance of the articles or processes being ready for inspection or test.

Q-3 Government Source Inspection (GSI) is required prior to shipment from the Supplier's facility. Upon receipt of this order, promptly notify the Government Representative who normally services your company and provide a copy of this Purchase Order so that appropriate planning for Government inspection can be accomplished.

Q-4 NMW's Customer Source Inspection (CSI) acceptance is required prior to shipment of articles on this Purchase Order from the Supplier's facility.

Q-5 During the performance of this order, the Supplier's Quality control or inspection system and manufacturing processes are subject to review, verification and analysis by authorized Government and or NMW's customer representatives. Government/customer inspection of product prior to shipment is not required unless the Supplier is otherwise notified.

SUBCONTRACTOR CERTIFICATION REQUIREMENTS

Q-10 Chemical/Physical Test Reports - CRITICAL REQUIREMENTS: Fabricated articles supplied on this order must be accompanied by actual chemical/physical test reports pertaining and identified to any materials used which are controlled by a reference specification. Material received at NMW without the required test reports will not be accepted.

Q-11 NMW Furnished Material - CRITICAL REQUIREMENT: The Supplier shall furnish with each shipment a signed statement identified to the material, Purchase Order and packing sheet, certifying that NMW furnished material was used without substitution (or listing all authorized substitutions) in the production of the articles specified in the contract or Purchase Order. Material received at NMW without the required certification will not be accepted. The Supplier shall produce the articles specified in the contract or Purchase Order using the material supplied by NMW for the purpose of producing said articles. Any required substitution of material must be authorized formally by NMW. Articles produced from substitute materials shall be so identified, and handled as a separate manufacturing lot with associated certifications.

NOTE: Certification must contain the following information:

- a. NMW P.O. number
- b. Drawing or Specification number
- c. Revision Letter
- d. Quantity
- e. NMW assigned trace or date code number(s)
- f. Supplier's Production lot number (identify separate lots)
- g. Serial number when applicable

Q-12 Standard Certification - The following statement, or substantial equivalent, shall appear on the packing slip or an accompanying certificate of conformance specifically identified to the articles, and must be received at our plant with receipt of each shipment: "*The articles supplied in this shipment were produced from materials for which the supplier has available for examination Chemical and/or Physical Test Reports indicating conformance to applicable specifications.*" Such statements must be dated and signed by an authorized representative of the Supplier, showing title. Articles received at NMW without the required certification will not be accepted.

NOTE: Certification must contain the following information:

- | | |
|------------------------------------|-------------------------------------------------------------------------------|
| a. NMW P.O. number | e. Raw material mfr.'s lot, batch, mill, heat or melt number(s). ID each lot. |
| b. Drawing or Specification number | f. Supplier's Production lot number (identify separate lots) |
| c. Revision Letter | g. Serial number when applicable |
| d. Quantity | |

Q-13 Supplier shall furnish certification stating that the requirements of the Purchase Order were met. It is not necessary for the Supplier to maintain supportive data on this Purchase Order, unless otherwise stated.

Q14 At the time of acceptance of a new order or prior to the delivery of existing orders, the Supplier is required to notify NMW of any design, material or process changes - including the location of manufacture. NMW shall evaluate the change to determine if the form, fit, function, reliability or qualification status of the product or service being supplied has been affected.

Q15 Homogeneous Lot Certification. The supplier shall certify that the entire order quantity is the product of a single homogeneous manufacturing lot. A homogeneous manufacturing lot is defined as the number of parts of the same part number, produced from the same traceable raw material lots, under essentially identical conditions, during one manufacturing time span not to exceed six weeks and offered for inspection at one time.

TEST DATA

Q-20 Supplier shall furnish a certified report of chemical and/or physical analysis of the materials to be supplied to NMW. Reports shall include the actual measured values and indicate compliance or noncompliance with applicable specifications.

Q-21 Supplier shall furnish functional test data with each unit or item shipped. Data sheets shall reference or include applicable Purchase Order and packing slip numbers, part or model numbers, configuration or revision status, drawing, specification and/or catalog numbers and min/max limits to which tested for respective items, as applicable.

Q-22 Supplier shall furnish, with the first shipment of each item, sufficient drawing and specification data to facilitate inspection of the items, including as a minimum, all applicable mounting, interface, performance and environmental data with S/N or other identification as applicable.

Q-23 Supplier certification shall include nomenclature, identification number, calibration interval and source, and environmental conditions under which the measurement standards were applied. Certification shall include all necessary correction data, and indicate that the calibration of all standards used are traceable to the National Institute of Standards and Technology (NIST).

Q-24 Certified test data, attested to by the supplier and properly recorded on appropriate letterhead by the organization performing the tests, shall be supplied with each shipment related to this Purchase Order. The test report must contain all of the factual information necessary to demonstrate conformance to the specification made a part of the Purchase Order, and shall include S/N or other identification as applicable.

Q-25 Statistical Process Control (SPC) data is required. The selection of key characteristics or critical parameters shall be proposed by the Supplier and shall be subject to NMW's approval.

LIMITED LIFE MATERIAL

Q30 For Limited Life Material only, the shelf life, expiration date, and recommended storage conditions when applicable, must accompany each lot, batch and/or shipment of limited life material. The Limited Life Material shall have at least 75% of the specified shelf life period remaining. Limited shelf life materials include but are not limited to paints, epoxies, solder, various other chemicals and adhesives, and rubber material.

QUALITY ASSURANCE SYSTEM REQUIREMENTS

Q-35 Supplier shall control and maintain all test and measurement equipment used for inspection and acceptance in accordance with ANSI/NCSL Z540-1 or an equivalent NMW approved Calibration System.

Q-36 NASA - supplier shall establish and maintain an inspection system applicable to this order that meets the requirements of NHB-5300.4(1.c).

Q37 Supplier shall establish and maintain an inspection system applicable to this order that meets the requirements of MIL-I-45208A.

Q-38 A NMW approved inspection system.

SUPPLIER TRACEABILITY SYSTEM

Q39 Supplier shall establish and maintain a Quality Management System, and have evidence of certification, according to the requirements of ISO 9001, AS9100, or an equivalent standard approved by NMW.

Q-40 **CRITICAL REQUIREMENTS:** Supplier shall establish and maintain a system of traceability applicable to this order, which will allow the back-tracking of records to the specific Chemical/Physical/Electrical Test Report pertaining and identified to any material used which are controlled by a referenced specification. Records shall be retained by the supplier for a minimum of seven (7) years, and shall be available for NMW review upon request. Supplier's system shall assure that each manufactured lot remains separated and identified as such at all times, including shipment to NMW.

Q-41 **CRITICAL REQUIREMENTS:** Supplier shall impose the necessary traceability requirements on his subcontractors to assure the availability of records referencing and traceable to the reports pertaining to any materials used which are controlled by a referenced specification.

RAW MATERIAL CERTIFICATION/TEST REPORT REQUIREMENTS

Q-42 Chemical/Physical test reports - **CRITICAL REQUIREMENT:** Materials supplied on this order must be accompanied by actual chemical/physical test reports of the material. Such reports shall contain measured values and indicate compliance to requirements. Melt, heat or batch number, or other identifying numbers necessary to relate the test reports to the material shall be included. Material received at NMW without the required test reports will not be accepted.

Q-43 Standard Certification - Raw materials supplied on this order must be accompanied by a signed certification reading substantially as follows: *“The materials supplied on this order were manufactured in accordance with all contractually applicable specifications. Seller has available for examination chemical and/or physical test reports indicating conformance of the material to applicable specifications”*

NOTE: Material certification must contain the following information:

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>a. NMW P.O. Number</p> <p>b. Material Specification</p> <p>c. Revision Letter or issue date</p> <p>d. Material type or description</p> | <p>e. Raw material manufacturer’s Lot, Batch, Mill, Heat, or Melt Number(s) as applicable & traceable to a chemical and/or Physical Test Report. If multiple lots, identify & separate.</p> <p>f. Supplier’s Production Lot Number(s) as applicable. If supplier produces multiple lots, Identify and separate.</p> |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

TOOLING

Q-45 NMW owned tooling, procured and /or used in the performance of this order, shall be marked with the proper tool number and shall be delivered to NMW upon completion of this purchase order. Invoices for tooling are payable upon delivery of parts, made to applicable blueprint specification, which have been accepted by NMW or upon NMW’s acceptance of the tooling.

Q-46 This is a CPFF Contract with the U.S., and tooling must be handled in accordance with applicable regulations. Tooling must be marked “property of the U.S.” and also part number, tooling number, Government Contract Number. Parts of tools should be marked with “1 of 4”, “2of 4”, etc., where applicable. Supplier’s invoice for tooling shall be payable upon delivery of parts made to applicable blueprint specifications, which have been accepted by NMW or by acceptance of tooling by NMW, whichever occurs first. Upon completion of this purchase order, all tooling must be returned and marked “Attention CPFF Stores”.

Q-47 NMW owned tooling shall be retained by the supplier, pending further instructions as to proper disposition, upon completion of this order. The supplier shall be responsible for the control and storage of the tooling, necessary to avoid loss or damage. Supplier’s invoice for tooling shall be payable upon delivery of parts made to applicable blueprint specifications, which have been accepted by NMW or by acceptance of tooling by NMW, whichever occurs first.

INSPECTION REQUIREMENTS

Q-50 The supplier shall maintain an Inspection System relative to its Product/Service that assures NMW of Product/Service Inspection prior to shipment from the seller’s facility.

Q-51 Supplier shall furnish a First Article Inspection (FAI) Report with this order. The FAI Report must contain documented evidence of electrical compliance, dimensional conformance, and/or the adequacy of the processes as determined by appropriate destructive tests. First Article Inspection samples shall be labeled and packaged separately to permit the correlation of test results by NMW Quality Assurance.

TEST FACILITY

Q-55 The supplier shall provide the appropriate facilities, calibrated test apparatus and trained personnel necessary to accomplish tests as outlined in NMW's purchase order.

Q-56 The supplier shall accommodate and assist NMW's test personnel during pre-test and post-test operations.

Q-57 The supplier shall notify Government/Customer representatives for test witness as applicable.

Q-58 The supplier shall provide Certified Test Reports and associated documentation, containing reference to the NMW purchase order number, part numbers and serial numbers of units tested, the controlling test specifications, and the conditions - such as environmental - under which the testing was performed. The Certified Test Report shall be dated and signed by an authorized representative of the test facility.

RADIOGRAPHICS

Q-60 X-Ray requirements shall be as indicated on the applicable NMW drawing or purchase order and shall meet the intent of MIL-STD-453, unless otherwise specified.

PACKAGING

Q-65 The supplier shall assure that the supplies on this order are packaged with Best Commercial practice. Packaging shall provide adequate protection against damage and contamination.

Q-66 Suppliers of military or special packaging shall perform all functions necessary to comply with all purchase order and referenced specification requirements.

Q-67 Logmar Bar Codes shall be in accordance with all contractually applicable specifications.

CALIBRATION AND REPAIR OF TEST EQUIPMENT

Q-70 The supplier shall verify the performance or accuracy of the equipment at the time of receipt, and notify NMW of any out-of-tolerance conditions observed. Upon completion of calibration, the equipment shall have a new calibration label applied, containing the date of the next scheduled calibration.

Q-71 The supplier shall describe the equipment malfunction, the parameters and degree of out-of-tolerance, the suspected cause of the failure, necessary repairs, cost, and corrective actions, as applicable. Test and verification data, as required, shall accompany each unit upon return to NMW.

PURCHASED, RENTED OR LEASED TEST EQUIPMENT

Q-75 Supplier of purchased, rented or leased test equipment shall provide evidence of calibration, (See Q-35- if applicable), data sheets, operator's manual and catalogs, as necessary.

CHANGE NOTICES TO NMW PURCHASE ORDERS

Q-80 Acceptance of verbal change to this purchase order from anyone except the NMW Purchasing Department shall be at the supplier's own risk. Verbal instructions from the NMW Purchasing Department shall be followed by a Purchase Order Change Notice within 24 hours.

APPROVED SPECIAL PROCESSES AND/OR PROCESS SOURCES

Q-90 When a supplier is required to use a facility other than his own to perform a special process, the special process supplier shall require NMW's prior approval. Special Processes include, but are not limited to, the following: Plating, heat treating, chemical films, X-rays, magnetic particle and die penetrant inspection, soldering, encapsulation, welding, printed circuit boards, foundries, brazing, etc. The special processes shall meet the applicable specifications indicated on NMW's drawing, purchase order and/or statement of work. Material received that has been processed by a process source not previously approved by NMW shall be subject to rejection.

Q91 Suppliers of major subassemblies are required to submit copies of their parts and material specifications and process documentation for NMW's review and approval prior to critical design reviews (CDRs) or manufacturing readiness reviews (MRRs). Other required analyses; circuit stress, worst case, reliability, failure mode and effects, radiation, etc. shall also be available during these review sessions when specified on NMW's P.O. These documents establish the configuration baseline of the supplier's end item. Any/all proposed changes to baseline documents shall require NMW's review and approval prior to their implementation. The end item data package (EIDP) accompanying the delivery of each serialized end item shall include an as-designed as-built parts, material and processes list containing traceability information for all parts and materials and reconciling all differences between the as-designed and as-built configurations. The EIDP shall also include the manufacturing traveler or router showing the sequence of operations, the controlling documentation, references to recorded nonconformances, and providing accountability and objective evidence of the completion of each operation. Also required are copies of all nonconformance reports, waivers/deviations, digital photographs showing all critical elements taken prior to closure and at final acceptance.

5.0 Revision History

Revision	DCO #	Change Description	Release Date
K	D10079	Added Quality Clause Q-15; Q-15 added to Quality Clause Code E for space-qualified discrete components	1/4/02
L	D100100	Revise Quality Clause Q-14 to require reporting of changes so that Narda West can evaluate and determine if form, fit, function, reliability or qualification status of the product or service has been affected.	3/12/02
M	D100436	Added Quality Code 'M' (Table 1) to address the requirements Imposed on suppliers of major subassemblies (DC to DC Converters, TCXOs, etc.). Revised/clarified Quality Code L (Table 1). Clarified Q90 and added Q39 and Q91. Changed data retention requirement from 5 years to 7 years (Q40).	1/27/09
N	21030	Added Q41 and Q90 to Quality Clause Code A, Added Q90 to Codes B, C, E, and M. Added Quality Clause Code T	12/10/14
P	22876	Cleaned up document, Changed Para 4.0 Codes for Limited life material. Added Code Grp3 for Group 3 quality requirements. Updated Code Q30 to add 75% of shelf life required.	2/19/2019
R	23466	Added paragraphs 3.4 to 3.6. Notifying the suppliers of acceptance and delivery goals	Feb-5-2020