



DEPARTMENT OF THE NAVY
NAVAL SURFACE WARFARE CENTER
CARDEROCK DIVISION

NAVAL SHIP SYSTEMS
ENGINEERING STATION
PHILADELPHIA, PA 19112-5083

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From: Commander, Naval Surface Warfare Center, Carderock
Division, Ship Systems Engineering Station
To: Commander, Space and Naval Warfare Systems Command,
Headquarters San Diego (Code PD 15Q)

Subj: APPROVAL PROCESS FOR ITEM LISTING IN THE FIBER OPTIC RECOMMENDED
COMPONENTS PARTS LIST

Encl: (1) Qualified Products List (QPL) Documentation and Test Process Sequence, Generalized Summary
(2) Items Evaluated During A DSCC Audit, Partial List
(3) Items Reviewed During A Navy Drawing or COTS Site Inspection, Partial List

1. This letter addresses the approval process for item listing in the Fiber Optic Recommended Components Parts List. The Fiber Optic Laboratory (FOL) at the Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station (NSWCCD-SSES) is responsible for maintenance of this parts list. The approval process varies with the different component specification types. The four component types addressed in this letter are (1) qualified products per military specification; (2) first article products per military specification; (3) approved sources to Navy Drawings; and (4) approved Commercial-Off-The-Shelf (COTS) products.

2. QPL specifications. The process for qualifying to a military specification is summarized in enclosure (a). The site audit is addressed more completely in enclosure (2). Product qualification by similarity is specified in each individual specification. Abbreviated qualifications may be considered on a case-by-case basis for changes in material or construction to existing component configurations. Entry on the parts list letter occurs upon granting of qualification approval.

3. First article specifications. Entry on the parts list requires the following:

- a. Submit first article samples.
- b. Submit a complete first article inspection test report.
- c. Submit to a site inspection per enclosure (3).

Entry on the parts list letter occurs upon acceptance of the submitted first article samples, acceptance of the submitted data package and resolution of any site inspection concerns. The Navy reserves the right to perform the testing on any component deemed appropriate prior to placement on the recommended parts list.

4. Navy Drawing. Entry on the parts list requires the following:

- a. Submit one of every item on the drawing.
- b. Submit a test report containing required test data.
- c. Submit to a site inspection per enclosure (3).

Entry on the parts list letter occurs upon acceptance of the submitted item, acceptance of the submitted test report and resolution of any site inspection concerns. The Navy reserves the right to perform the testing on any component deemed appropriate prior to placement on the recommended parts list.



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5. COTS. Entry on the parts list requires the following:

- a. Submit product samples.
- b. Submit a complete test data package. COTS component test data package requirements may be obtained from NSWCCD-SSES.
- c. Submit to a site inspection per enclosure (3).

Entry on the parts list letter occurs upon acceptance of the product samples, acceptance of the submitted data package and resolution of any site inspection concerns. The Navy reserves the right to perform the testing on any component deemed appropriate prior to placement on the recommended parts list.

6. The Navy reserves the right to add, change or delete components from the recommended parts list. The Navy reserves the right to test any component prior to placement on the recommended parts list.

7. NSWCCD-SSES FOL point of contact for technical issues regarding testing and test/product submission sites is E. Bluebond, (215) 897-8510.

J. P. Coppola
By Direction

Copy to:

SPAWAR PD 15Q2 (C. LeBoeuf)
SPAWAR PD 15Q2 (D. Mullins)
NAVSEA 03.J21 (H. Lewis)
NAVSEA 03.J21 (C. Courchaine)
NAVSEA 03.J21 (K. Long)
NSWC DD B35 (G. Brown)
DSCC-VQP (A. Eschmeyer)
DSCC-VQP (R. Wallace)

12 March 1998

QUALIFIED PRODUCTS LIST (QPL)
DOCUMENTATION AND TEST PROCESS SEQUENCE
GENERALIZED SUMMARY

1. Submit DSCC Form 19P.
 - a. Submittal of this form will initiate the QPL process.
2. Submit reliability assurance program plan. These items must be submitted to DSCC two months prior to the audit.
 - a. Documentation to be submitted includes:
 - (1) MIL-STD-790 program plan only.
 - (a) DESC Form 696 (QA program: MIL-STD--790 vs company documentation).
 - (b) DESC Form 695 (calibration: MIL-STD-45662 vs company documentation).
 - (2) Program plan for all QPL components.
 - (a) Flow chart of manufacturing process (use paragraph 5.2.17 of MIL-STD-790E, if MIL-STD790 program plan; if not, then may use for guidance).
 - (b) Equipment List (DESC Form 36 or equivalent format for equipment used to test product).
 - (c) Test procedures.
 - b. A. plant audit, performed by DSCC, will be scheduled upon review and acceptance of the reliability assurance program plan.

Note: Test procedures need to be prepared for the audit. Test procedures prepared previously should be reviewed for applicability. The test procedures are required during the audit; however, submittal prior to the audit is preferred.
3. Prepare for plant audit.
 - a. DSCC audits manufacturer's product line(s), quality assurance program and test facilities. Items evaluated during the DSCC audit include;
 - (1) Procedures (both test and process).
 - (2) Equipment list.
 - (3) Training.
 - (4) Self audit.
 - (5) Operator performance of test/process.
 - (6) Process flow chart.
 - (7) Documentation control.
 - (8) Material control.
 - (9) Calibration system.
 - (10) Quality control.
 - (11) Failure and defect analysis program.

Note: Procedures are used to ensure proper and consistent testing/product, evaluate operator competence, perform/evaluate training and verify proper test performance during a self-audit.

 - b. Ensure process and test documentation available for inspection.
 - c. Ensure process, test and QA personnel present for audit.
 - d. DSCC prepares list of discrepancies that must be corrected before the manufacturing line(s) are certified.
 - (1) DSCC sends written notification to the manufacturer that the line(s) are certified upon correction of the discrepancies.
 - (2) Manufacturer receives authorization from DSCC to perform initial qualification testing after the line(s) are certified.

Enclosure (1)

4. Perform initial qualification testing.
 - a. Submit test schedule at least one month prior to start of testing (if feasible).
 - b. Ensure data sheets contain test data and information required by DSCC as specified in DESC publication: Qualification Information for Manufacturers.
 - c. Ensure specified personnel are on site to witness testing, when required (Government DEMC-QAR, etc.).
5. Submit test report.
 - a. Use DESC Form 36F or equivalent.
 - b. Place original data sheets behind DESC Form 36F.
 - c. Submit test samples as required (Submit one to DSCC, remainder to NSWCCD-SSES).
6. Await placement on a QPL.
 - a. DSCC reviews test report.
 - b. DSCC places manufacturer on QPL listing if test report shows conformance to the military specification.
7. Maintain QPL certification/qualification.
 - a. Perform quality conformance (Group A, B and C) testing.
 - b. Maintain quality assurance provisions as specified by the applicable military specification.
8. General.
 - a. All documentation is to be submitted to DSCC with a copy to NSWCCD-SSES.
 - b. Responses on technical issues regarding QPL testing and copies of DESC publication "Qualification Information for Manufacturers" can be obtained from NSWCCD-SSES point of contact E. Bluebond. He can be contacted at (215) 897-8510, FAX: (215) 897-8509.
9. Miscellaneous Topics.
 - (a) Manufacturing Process Where Multiple Lines/Equipment Is Used.
 - (1) Audit approach to multiple lines/equipment.
 - (a) Identify stages on the process flow chart where multiple equipment is used.
 - (b) Perform sampling for those stages during an audit in lieu of 100 percent inspection.
 - (2) Reporting requirements for multiple lines/equipment.
 - (a) Report changes in the process sequence (additions, deletions, changes in order, etc.) upon incorporating the change into the process.
 - (b) Report changes in product materials upon incorporating the change into the process.
 - (c) Report any process change that affects physical dimensions or degrades product performance upon incorporating the change into the process. This change must still permit the product to meet specified requirements.
 - (d) Report new and modified equipment at the start of the next audit.
 - (e) Report of changes in machine control parameters is not required.
 - b. DSCC MIL-STD-790 audit versus ISO-9000 audit. The DSCC MIL-STD-790 audit is similar to an ISO-9000 audit. One significant difference is that a DSCC MIL-STD-790 audit thoroughly examines the test procedures (i.e., both test and manufacturing process procedures). These test procedures are used to ensure proper and consistent testing (product), evaluate operator competence, perform/evaluate training and verify proper test performance during a self-audit. An ISO-9000 audit concentrates more on the procedures involved with controlled documentation.
 - c. Outside test laboratory services. Unless otherwise authorized by DSCC, use of outside test laboratories will be restricted to those on the "List of Commercial Laboratory Suitable For Testing Military Devices" prepared by DSCC. When applicable, NSWCCD-SSES test laboratory can be used to test/qualify fiber optic components also.

10. Quality Conformance Testing.
- a. Intent
- (1) Group A: Screening tests to ensure product meets specification. When applicable, particular test methods already in place for production (only parameters sampled) will be used.
 - (2) Group B: Tests selected are those which provide a check of product design and process control. Summary of Group A and B testing must be submitted to DSCC on a yearly basis.
 - (3) Group C: Requalification of the product, which is performed every 60 months. Tests selected are those, which are performed by industry, and those, which are important to the military. Manufacturer is expected to perform Group C tests; however the option is available to ask the Government for assistance in the performance of any specialized testing.
- b. System flexibility.
- (1) The military specification is a legal document; however, there is flexibility in the system.
 - (a) Navy is aware of the burden these tests place on individual companies. The Navy is willing to negotiate on the issues where the manufacturer's process is not compatible with military requirements, but the tests performed accomplish the same result and will not compromise on the standards required.
 - (b) Any production, including limited production volume, requires that specified reporting periods still be maintained. If no production occurs during a reporting period, DESC Form 1718 must be completed. This form is used to ensure that manufacturer capability is maintained although no production has occurred. If DSCC receives two to three consecutive no production reports, DSCC will determine if a Group C test is still warranted.
 - (2) Test failures. Products on the QPL must meet the requirements of the specification as defined by the Government. If a product fails a test, the manufacturer is required to notify the Government immediately that the product from that lot is not within the specification. Proposed corrective action must be approved by the Qualifying Activity (DSCC) and the Navy Technical Agent (NSWCCD-SSES) prior to implementation.
 - (c) Product change. The manufacturer must notify the Government of any change in the process or product being shipped with the exceptions listed above.

ITEMS EVALUATED DURING A DESC AUDIT
PARTIAL LIST

1. Procedures (both test and process).
 - a. Test procedures (including inspection procedures) must be specific to the equipment/instruments used to perform the test and must have sufficient detail so that someone with minimal training can "step in" and perform the test and must include the following:
 - (1) Setup procedure or sufficiently detailed schematic, as appropriate.
 - (2) Step-by-step test method specific to the equipment/instruments to be used and to the component(s) being tested.
 - (3) Pass/fail criteria (specification requirements).
 - (4) Equipment list or specific reference to such equipment.
 - (5) Reference documentation must be listed. Also, latest version of military and commercial specifications cited in the component specification must be available and shown during the audit.
 - (6) Sample calculations for test methods where mathematical equations are used to determine the results.
 - (7) Data sheet where standard data sheet is not used or appropriate. Data sheets must contain information specified in DESC General Qualification Information Supplement.
 - b. Process procedures must be specific to the equipment/instruments used on the manufacturing line(s) used to manufacture the component(s) and include the following:
 - (1) Setup procedure or sufficiently detailed schematic, as appropriate.
 - (2) Step-by-step operating procedure for each station specific to the equipment/instruments to be used to manufacture the component(s).
 - (3) Acceptance/rejection criteria.
 - (4) Sample calculations for specific process steps/stations where mathematical equations are used to determine the results.
 - (5) Process control documentation used at each station to verify work at each station performed properly.
2. Equipment list.
 - a. List must contain the information on DESC Form 36.
 - b. List can be prepared in an equivalent format.
 - c. List must reflect time period submitted to DESC or prior to or at time of audit.
3. Training.
 - a. Required level of proficiency must be demonstrated for each test, process or inspection performed.
 - b. Each individual must be retested or retrained (or both) at the end of a designated period or when personal performance indicates poor proficiency.
 - c. Training must be specific to methods or procedures used to test, produce and inspect the QPL component (s).
 - d. Test, process or inspection procedure can be used to train the applicable personnel.
 - e. On-the job training is acceptable. Documentation must include the trained individuals, trainer, duration of training and supervisor/laboratory coordinator sign off , indicating that trained individual understands the procedure.
 - f. Training records must be available for each individual that performs the test (including inspections) or process.

Enclosure (2)

4. Self audit.
 - a. Intent is to verify that the personnel can perform the test (including inspection) process procedure (technically competent). Understanding of, and compliance with documentation control and calibration system maintenance must also be demonstrated.
 - b. Once written, the applicable procedure can be used as a tool to perform the self-audit.
 - c. Documentation must be maintained that includes the results of the self-audit.
 - d. For a QPL component with a MIL-STD-790 Product Assurance Program, Appendix A of that standard also applies.
5. Operator performance of test/process.
 - a. During the audit, DSCC inspectors review each test/process procedure, verify that equipment matches the equipment list and review the steps involved with each test or process step with the personnel that perform that function.
 - b. Personnel that perform functions evaluated during the audit must be present and available. This includes personnel involved with training, self-audit, calibration, documentation control, material control and quality control.
6. Process flow chart.
 - a. Flow chart must have sufficient detail to identify each step in the manufacturing process.
 - b. Flow chart must include inspection, testing, quality verification points and point where materials or subassemblies enter the process.
 - c. Flow chart must identify the steps where multiple equipment is used, if applicable.
7. Documentation control.
 - a. Review system to ensure all required documentation is in existence and that only the latest version is used.
 - b. Various material certifications, shipping and receiving documents, travelers and other applicable records will be selected randomly for review.
8. Material control.
 - a. Incoming, in-process, outgoing and inventory material control measures will be selected randomly for review.
 - b. Material control includes raw materials, piece parts and product.
9. Calibration system.
 - a. Calibration system will be reviewed to determine conformance with MIL-STD-45662.
 - b. A record must be kept for each instrument, which includes the measurement values obtained during each calibration.
 - c. Documentation or method used for calibration recall must be presented.
 - d. Calibration records and instrument labeling will be selected randomly for review.
10. Quality control.
 - a. Quality control should be performed to the degree that it is needed.
 - b. Quality control operations must be documented as to type, procedures, equipment, judgement and action criteria, records and frequency of use.
11. Failure and defect analysis program.
 - a. This program is to include failure reporting, failure and defect analysis records, analysis capabilities and facilities, and corrective action plans.
 - b. For a QPL component with a MIL-STD-790 Product Assurance Program, paragraph 5.2.4 of that standard also applies.

Note: Procedures are used to ensure proper and consistent testing/product, evaluate operator competence, perform/evaluate training and verify proper test performance during a self-audit.

Note: DESC General Qualification Information, DESC General Qualification Information Supplement and MIL-STD-790 (if applicable) should also be used as a guide to prepare for the DSCC audit.

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ITEMS REVIEWED DURING A FIRST ARTICLE SPECIFICATION,
NAVY DRAWING OR COTS SITE INSPECTION

1. Procedures (both test and process).
 - a. Test procedures (including inspection procedures) must be specific to the equipment/instruments used to perform the test, must have sufficient detail so that someone with minimal training can “step in” and perform the test.
 - b. Process procedures must be specific to the equipment/instruments used on the manufacturing line(s) used to manufacture the component(s) and shall include:
 - (1) Setup procedure or sufficiently detailed schematic, as appropriate.
 - (2) Step-by-step operating procedure for each station specific to the equipment/instruments used to manufacture the component (s).
 - (3) Acceptance/rejection criteria.
 - (4) Sample calculations for specific process steps/stations where mathematical equations are used to determine the results.
 - (5) Process control documentation used at each station to verify work at each station performed properly.
2. Training.
 - a. Required level of proficiency must be demonstrated for each test process or inspection performed.
 - b. On-the-job training is acceptable.
3. Operator performance of test/process.
 - a. Review random test/process procedure, verify equipment matches the equipment list and review the steps involved with each test, or process step, with the personnel that perform that function.
 - b. Personnel that perform functions evaluated during the audit must be present and available.
4. Documentation control.
 - a. Review system used to ensure all required documentation is in existence and that only the latest version is used.
 - b. Various material certifications, shipping and receiving documents, travelers and other applicable records will be selected randomly for review.
5. Material control.
 - a. Incoming, in-process, outgoing and inventory material control measures will be selected randomly for review.
 - b. Material control includes raw materials, piece parts and product.
6. Calibration system.
 - a. A record must be kept for each instrument, which includes the measurement values, obtained during each calibration.
 - b. Documentation or method used for calibration recall must be presented.
 - c. Calibration records and instrument labeling will be selected randomly for review.
7. Quality control.
 - a. Quality control should be performed to the degree that it is needed.
 - b. Quality control operations must be documented as to type, procedures, equipment, judgement and action criteria, records and frequency of use.

Note: Procedures are used to ensure proper and consistent testing/product and to evaluate operator competence.

Enclosure (3)