



Certification and Qualification Information for General Specifications

DSCC-VQP
REVISION: Original
July 1, 1998

PREFACE

This document is applicable to general specifications administered by the Defense Supply Center, Columbus (DSCC) in its capacity as the qualifying activity. This publication has been developed to outline and discuss the elements needed for you to successfully qualify your products for listing on the Qualified Products List (QPL).

The details discussed in this publication apply only to qualification programs administered by the Defense Supply Center, Columbus, Sourcing and Qualifications Unit (DSCC-VQ) in its capacity as qualifying activity for general specifications.

The manufacturer, by application and subsequent listing on a Qualified Products List (QPL), agrees to comply with all provisions specified in the applicable specification and herein.

This publication outlines the elements necessary for QPL program to be acceptable. This publication will list the key elements needed, but leave the format and implementation of these elements to the manufacturer.

The QPL program is designed to assure a requisite level of performance, quality and reliability necessary for the Department of Defense (DoD).

A handwritten signature in black ink, appearing to read "L. Darrell Hill". The signature is written in a cursive style with a long horizontal line extending to the left.

L. DARRELL HILL
Chief
Sourcing and Qualifications Unit

CONTACT POINTS

Comments or recommendations which may be of use in improving this document should be addressed to: Defense Supply Center, Columbus ATTN: DSCC-VQ, 3990 East Broad Street, Columbus, Ohio 43213. Requests for copies of this document should also be forwarded to DSCC-VQ.

Requests for an assessment or for further information about the MIL-STD-790 program should be directed to one of the VQ contacts listed in Section I.

DSCC:	Defense Supply Center, Columbus
DSCC-V:	Logistics Office (James A. Gambert, Director)
DSCC-VQ	Sourcing and Qualifications Unit (L. Darrell Hill, Chief)
DSCC-VQ:	Passive Devices Team (Robert P. Evans, Chief)

Request for copies of DoD 4120.3-M (Defense Standardization Program (DSP) Policies and Procedures, SD-6 (Provisions Governing Qualification Qualified Products List)) MIL-STD-790, MIL-STD-202, and any other military document should be addressed to DoD Single Stock Point Special Assistance Desk, 700 Robbins Avenue Bldg 4D Philadelphia, PA 19111-5098, (215) 697-2179, M-F 7:30a.m. to 4:30p.m. (EST). See web site www.dodssp.daps.mil.

TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>	<u>PAGE</u>
	Points of Contact	3
I	Requesting an Audit	5
II	Manufacturer Audit for Certification	6
III	Qualification	8
IV	Qualification Testing Procedures and Format	9
V	Certification/Qualification Maintenance	14
VI	List of Acronyms	17
	Common Audit Findings	18

REFERENCES

Military specifications and Qualified Products Lists (QPLs) for a specific stock class may be requested by contacting the applicable DSCC-VQ agent called out on our web site.

http://www.dscclia.mil/offices/sourcing_and_qualification/

The numbers and titles of the military standards, manuals, and handbooks referenced by this document are listed below.

<u>NUMBER</u>	<u>TITLE</u>
DoD 4120.3M	Defense Standardization and Specification Program Policies Procedures, and Instructions
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts
MIL-STD-790	Product Assurance Program for Electronic and Fiber Optic Specifications
MIL-STD-883	Test Methods and Procedures for Microelectronics
SD-6	Provisions Governing Qualification
ANSI/NCSL-Z540-1 or ISO 10012 -1 Calibration Systems Requirements	

Copies of DoD 4120.3-M, Military Specifications, Military Standards, and SD-6, may be obtained from:

DoD Single Stock Point Special Assistance Desk
700 Robbins Avenue, Building 4D
Philadelphia, PA 19111-5094

Phone (215) 697-2179, FAX (215) 697-1462

The Sourcing and Qualifications Unit has a web site. See next page for details.

DSCC-VQ: SOURCING AND QUALIFICATION

UNIT

Defense Supply Center Columbus, 3990 East Broad Street, Columbus, OH 43216

http://www.dscclia.mil/offices/sourcing_and_qualification/

The Sourcing and Qualification web pages were originally developed mid 1995 to provide a user-friendly approach to downloading the Unit's Query Tool programs. The web pages have since been expanded to disseminate much of the public information that was formerly distributed on paper. Our Unit continues to support those customers who rely on paper documents, but we are developing cost effective real-time alternatives to the traditional paper documents, and providing them on the World Wide Web.

General features of the VQ web pages:

- Most pages and graphics are very small for fast transfer to the user's computer
- Pages have been written to utilize the latest features of the Hypertext Markup Language (HTML) language Version 3.2. Pages are best viewed with Netscape Navigator 3.01, or Microsoft's Internet Explorer 3.02. Pages that do not use HTML Tables are backward compatible to the most basic of web browsers.

Items currently available on the VQ web pages:

- General information from the Unit office including the mission, organizational chart, directions to DSCC, and information for visitors.
- General information for each of the Unit's four Teams (**Custom Devices**, **Hybrid Devices**, **Passive Devices**, and **Electronic Devices**). Information includes program information, contacts, available downloads, audit schedules, and QML/QPL status.
- Information about the Unit's **ISO 9000 value-added audit program** including background information, audit information, and the DSCC-VQ ISO 9000 Registration list.
- Reports and information including progress reports, program initiatives, newsletters, and program updates.
- Information about the Unit's Commercial Laboratory Suitability Program (Includes List of Commercial Laboratories Suitable for Testing Military Devices).
- An **on-line part search** capability that encompasses QML-38534, QML-38535, and QPL-19500. Downloading is not required.
- Discussion forums for answering manufacturer's questions about the program and encouraging information exchange between customers.
- A Guest Book for user's general comments about the web site.
- **Qualified Manufacturers List (QML)** and **Qualified Products List (QPL)** documents available in the Adobe Portable Document Format.
- A web page where customers can add contact information so that they may be notified of significant web site changes.
- Automated Notification System for updated QMLs/QPLs available in Adobe Acrobat format (send e-mail to Ned Raybould at Edward_Raybould@dscclia.mil, with your e-mail address, telephone number, name, and list of QPLs and QMLs you wish to be notified of when changes are made).
- **Downloadable Query Tool applications** that provide searching and filtering functionality for QML-38534, QML-38535, and QPL-19500. These are computerized alternatives to the hard copy documents.

Future initiatives for the VQ web pages:

- More QPLs available through the on-line part search engine
- Other features created at a user's request

For further information about the Sourcing and Qualification Unit web pages, contact:
VQWebTeam@dscclia.mil

Ned Raybould, 614-692-0582, Edward_Raybould@dsc.dla.mil
Rick Barker, 614-692-0596, Richard_Barker@dsc.dla.mil

Points of Contact

DSCC-VQ
Defense Supply Center Columbus
Sourcing and Qualification Unit
Passive Devices Team

Fax numbers: (614) 693-1660, (614) 692-6942 or (614) 692-6943

<u>Name</u>	<u>Phone Number</u>	<u>DSN</u>	<u>E-mail address</u>
Robert Evans (Team Chief)	(614) 692-0677	850-0677	robert_evans@dsccl.dla.mil
Gail Groseclose (Secretary)	(614) 692-0581	850-0581	gail_groseclose@dsccl.dla.mil

Group I: 5905 Resistors/5910 Capacitors/5915 Filters/5950 Transformers/5965 Headsets, Loudspeakers, and Microphones/5999 Miscellaneous/1650, 2530, 4720, 4730, 4930 Construction

Gene Ott	(614) 692-0665	850-0665	gene_ott@dsccl.dla.mil
Mark Parshall	(614) 692-0666	850-0666	mark_parshall@dsccl.dla.mil
Carl Radeloff	(614) 692-0664	850-0664	carl_radeloff@dsccl.dla.mil
Nancy Wells	(614) 692-0598	850-0598	nancy_wells@dsccl.dla.mil
Jeff Zern	(614) 692-0597	850-0597	jeffrey_zern@dsccl.dla.mil

Group II: 5935 Connectors/6145 Wire and Cable/GP60 Fiber Optics

Brian Burns	(614) 692-7105	850-7105	brian_burns@dsccl.dla.mil
Angela Eschmeyer	(614) 692-7106	850-7106	angela_eschmeyer@dsccl.dla.mil
Mike Peppas	(614) 692-7108	850-7108	michael_peppas@dsccl.dla.mil

Group III: 5920 Fuses/5925 Circuit Breakers/5930 Switches/5945 Relays/5955 Crystals and Oscillators/5999 Miscellaneous

Todd Lewis	(614) 692-0503	850-0503	todd_lewis@dsccl.dla.mil
Joel Hemmila	(614) 692-7107	850-7107	joel_hemmila@dsccl.dla.mil
John Schwarz	(614) 692-0504	john_schwarz@dsccl.dla.mil	
Art Woolum	(614) 692-0505	850-0505	william_woolum@dsccl.dla.mil

NOTE: This information is correct as of the date of publication. For up to date information, check the VQ web page.

A BRIEF OVERVIEW

Qualified Products List (QPL)

The QPL lists specific families of part numbers which the manufacturer has demonstrated the capability to manufacture reliably and in compliance with his own internal requirements and the military specifications.

STEPS TO QUALIFICATION LISTING

Initially, through documentation, a manufacturer establishes a quality program. Then the program is implemented to ensure required support systems, processes, materials, procedures, and controls are working. DSCC-VQ performs an on site audit of the manufacturer's facilities to assure that these support systems, processes, materials, procedures and controls are implemented and working to provide the desired performance, quality and reliability necessary for the DoD. This is accomplished by reviewing documentation and data, observing processes and tests, looking at actual parts, and interfacing with personnel.

The manufacturer submits product built to the requirements of the quality program to a series of strenuous environmental and electrical tests. These tests, as specified in the applicable specification, give data concerning the performance, quality and reliability of the part. Upon successful completion, QPL listing is granted. Representative product is periodically tested to verify continued conformance to the military performance, quality, and reliability envelope.

Only the manufacturers and users can make the qualification program work. Each manufacturer must educate his customers on the use of QPL products and make such products available. Each military user must enforce the use of qualified products through contractual requirements. Only in this way can all the full benefits of the qualification program be realized.

SECTION I**REQUESTING AN AUDIT**

To begin the qualification process, the manufacturer must first contact this office to request an audit. DSCC-VQ will then send a preaudit letter which specifies the information to be submitted by the manufacturer to DSCC-VQ. The manufacturer may be requested to schedule a meeting with DSCC-VQ to discuss the qualification program and the required preaudit documentation and data.

These precautions are intended to ensure the following items:

- The manufacturer has a documented and controlled operation.
- The manufacturer is meeting his own requirements as well as the military requirements.
- The manufacturer has a functional program in place, with supporting data as necessary.
- The manufacturer has a self audit program.

Self audit results, a quality assurance program plan, as well as other information may be requested to help support the accomplishment of the items listed above.

The advantages to having preaudit requirements are:

- Better use of manpower and funds.
- Performance of timely, effective, and successful audits.
- Quick turnaround from the audit to obtaining QPL listing.

SECTION II**MANUFACTURER AUDIT FOR CERTIFICATION**

The goal of the audit is for DSCC-VQ to verify that the manufacturer has implemented a working qualification system that incorporates all of the manufacturer's and military's requirements (see the applicable military specification and standard). The audit shall provide the audit team with an acceptable confidence level that the manufacturer has a program for continually building high quality product that meets all the military specification requirements without constant government oversight.

A team made up of experts from DSCC-VQ (typically 2 auditors), will perform the audit over a 1-3 day period. The team will apply a sampling technique to various production, testing and quality elements to assure the system is working properly and continuous quality is achieved. Auditors will question and observe operators, examine actual product, as well as review records, operating procedures, and data. All areas from incoming materials to shipment of final product are subject to review.

Below is a list of areas that DSCC-VQ considers essential in order for a manufacturer to become qualified.

- Process parameters are specified and controlled to assure repeatability of processing.
- Test methods are documented in operating procedures, describing how to perform the tests using the manufacturer's own equipment. Test methods shall meet the requirements of MIL-STD-883, MIL-STD-1334, MIL-STD-202 and the applicable military specification as interpreted and approved by DSCC-VQ.
- All necessary elements are contained in the company's quality manual.
- Product is not shipped to the customer or to the next level of assembly until qualification testing and Quality Conformance Inspection (QCI) have been performed and verified.
- A change control review is in place to identify required notification and the impact of any product or military specification changes. This includes determining qualification testing to be performed and whether notification to DSCC-VQ or the prior to implementation customer is required.
- Calibration system effectiveness.
- An ongoing self-audit program is implemented to ensure compliance to military and customer specification and standards as well as to the manufacturer's internal specifications.
- A training program exists that assures each operator is properly trained and retrained in the production and testing of military product.

Attached is a listing of common audit findings for your company to review. Please review these findings.

During the audit, auditors document their observations and provide them to the manufacturer prior to departure. The manufacturer must respond to all observations identified as deficiencies within 30 days, unless otherwise noted.

Once the manufacturer corrects all deficiencies, a "Laboratory Suitability" certificate along with a letter will be sent to the manufacturer describing his successful completion of the audit. Even though there may be more than one processing/testing area at the facility, only those areas included in the audit, are approved

6

for manufacturing and testing QPL product. Products can only be produced in qualified plant locations using the approved qualification system (e.g. procedures, flowcharts, travellers, equipment.) NOTE: Any changes to the plant facility's location constitutes a major change which requires immediate notification of the qualifying activity. Depending on the extent of the move or change, requalification could be required.

SECTION III
QUALIFICATION

After successful completion of the audit, the next step is to qualify the processes, materials, or products audited by the government team. Qualification is accomplished by:

Step 1. Selecting a product or products that are representative of the processes, materials, and technology to be qualified.

Step 2. Submitting an application (DSCC Form19P) for qualification testing to DSCC-VQ (See Section IV, Qualification Testing Procedures and Test report Format.). The application for qualification testing must specify the following, as a minimum:

- Product to be Tested
- Testing to be Performed (100% Screen and Sample testing)
- Sample Sizes
- Test Locations (in plant or an approved laboratory)

Step 3. Building the product, following the approved flows, and using the approved controls and operating procedures.

Step 4. Performing the testing per the approved test plan. All testing must be performed at a DSCC-VQ approved laboratory (Contact DSCC-VQ or our website for the current list of approved test labs.) Successful completion of these environmental, mechanical, and electrical tests verifies the performance, quality, and reliability envelope of the product.

NOTE: Qualification testing at all laboratories may be subject to monitoring by a Government Quality Assurance Representative (QAR). The QAR may select the tests he wishes to witness in addition to those specified by DSCC-VQ, however if the QAR can not make the agreed upon schedule, testing should not be delayed. The company must schedule those tests at a time agreeable to the QAR. The Government QAR signature verifies the test report, but it does not constitute government approval of the test report (paragraph 306 of SD-6).

Step 5. Submitting the test data and report to DSCC-VQ for review and approval.

Step 6. Listing of the manufacturer and products and/or processes and materials on the applicable QPL after DSCC-VQ approves the test data and test report.

Step 7. Testing of representative product is then performed periodically in accordance with the applicable military specification to verify continued conformance to the military performance, quality, and reliability envelope.

SECTION IV

Qualification Testing Procedures and Test Report Format

1. Application/Authorization Procedures

- a. The DSCC 19P form, for the most part, is self explanatory. The manufacturer will complete Section I and must have their Government (QAR) coordinate on the form. The manufacturer will then submit the form to the Sourcing and Qualifications Unit, Passive Devices Team (DSCC-VQ) and will be able to start the qualification testing immediately. This form therefore, eliminates the need to wait for an official response from DSCC-VQ before beginning testing. It should be noted, however, that any testing performed prior to receiving the signed form is done at the manufacturer's risk. Upon receipt of the form, DSCC-VQ will complete Section II and return the signed original with any additional comments to the manufacturer.
- b. One copy of DSCC Form 19P listing the product(s) to be tested is to be submitted to DSCC-VQ. Both the military part or type number and the manufacturer's part number shall be listed on the form.
- c. Normally an application/authorization form should be submitted approximately one month before test samples will be ready for qualification testing. If any test equipment must be audited for suitability status, then the application is to be submitted as soon as possible to permit DSCC-VQ to schedule the audit.
- d. If testing is to be done at more than one location, either approved company inplant laboratories or approved commercial test laboratories, the applicant must show clearly which tests each test laboratory will perform.
- e. If the specification has a family sampling plan where testing a few types will qualify additional types, the manufacturer shall identify the types he will test. He should list in the additional information block on Form 19P all types of the family for which he desires qualification.
- f. Line item number 3 of DSCC Form 19P is a reminder that all test facilities must be acceptable to DSCC-VQ before being used in qualification testing. Failure to have laboratory suitability prior to testing is a common cause of rejection, or delay in acceptance of a test report by DSCC-VQ.
- g. The application/authorization form must be signed by a company official who has the authority to commit the manufacturer of the product to the conditions stated in Form 19P.

2. The following general provisions apply to qualification testing. Failure to comply with them may result in rejection of the test.

- a. Test samples must have been manufactured at the approved plant which is listed on the application/authorization form (DSCC Form 19P).
- b. Qualification testing shall not be started prior to submittal of the DSCC Form 19P nor prior to establishing a test schedule which is acceptable to the Government QAR who will monitor the testing for DSCC.

9

- c. Tests must be performed at the laboratories listed for those tests on the DSCC application/authorization form. If it is necessary to change the laboratory selected for any test, the manufacturer shall inform DSCC prior to testing. DSCC-VQ will then revise or amend the application/authorization form.
 - d. Samples must be subjected to all tests required by the DSCC authorization in the sequence required by the specification. Test procedures must be in accordance with the applicable specification test paragraph or MIL-STD Test Method as interpreted by DSCC-VQ. If there are any questions on a test procedure, please phone or write DSCC-VQ before performing that test. If there are disqualifying failures or problems such as samples damaged in handling or improper testing, test equipment failure, marginal failures or unusual failure modes, DSCC-VQ must be notified before testing further.
 - e. All testing must be performed using test equipment found suitable by DSCC-VQ prior to testing.
 - f. Qualification testing at all nongovernment laboratories must be monitored by the Government QAR. The QAR may select the tests that they wish to witness. The company must schedule those tests at a time agreeable to the QAR. The Government QAR signature verifies the test report, but it does not constitute government approval of the test reports. (See paragraph 306 of SD-6)
3. Recording of Data - Test Data Sheets: Data should be presented in sufficient detail to substantiate the test procedures used and the results obtained in the testing. Failure to submit data in sufficient detail may be cause for rejection of the test report.
 - a. Standard DSCC data sheets are available for some specifications and may be used to record qualification test data. All blocks on the top of the data sheets shall be completed on all copies. When standard DSCC data sheets are not utilized, company forms may be used. It is recommended that they be reviewed by DSCC-VQ prior to use in qualification testing. The DSCC-VQ review is to assure that the company data sheet will contain all required information.
 - b. DATE and TIME each test was started and completed shall be recorded on the data sheet so that the sequence of testing can be established.
 - c. All actual environmental, mechanical and electrical test conditions existing at the time of the test shall be recorded by the test equipment operator. It is important that this data be recorded by

the operator at the time of test and not copied from the specification before testing or when the test report is being assembled.

d. All data in a qualification test report, such as test conditions and test results, must be the actual reading on each item in test. VARIABLES data is required for every measurement taken.

10

e. Dimensional measurements must include all dimensions on the applicable specification figure having a numerical value with a tolerance. Dimensions identified as nominal or reference will not be measured. In many drawings, only one value (usually identified as “typical”) is shown for such things as multiple mounting holes, several leads or several pins. However, all holes, leads or pins must be measured and their measurements recorded. When a specification does not specify the number of units for dimensional measurement, a random sample shall be selected as follows:

<u>No. of Units in Test Lot</u>	<u>No. of Units to be Measured</u>
1 - 10	All
11 - 110	10
111 - 180	15
181 & above	20

f. Test data for environmental and mechanical tests shall include all test conditions. For example, vibration test data must include: vibration amplitude (inches or “g’s”), frequency range, sweep time, duration and planes of vibration that were tested, as well as, any electrical values applied and recorded during test. Results of electrical testing before and after vibration shall be recorded. For tests involving time as a test condition (e.g., thermal shock test) the data should show the clock time that the test started and ended and as, the clock time and temperature for each step of each cycle. This data can be recorded on an operating log sheet and is acceptable as test conditions data in a test report.

g. For electrical tests, the data must include all applicable test conditions, i.e., voltage, current, frequency, etc., and the specified test characteristic. If the characteristic value is calculated, the data must include all readings, the characteristics measured, the formulas used for calculations, a sample calculation and the calculated values. For example, when voltage and current readings are taken for wattage calculation, the values of the voltage and current measured must be recorded on the data sheets along with the calculated wattage. A copy of any chart, table or nomograph used instead of calculations must be included with the data.

h. Corrections on data sheets will be made by ‘lining out’ the incorrect entries with a single line and inserting the correct entry immediately adjacent to the “lined out” entry. Erasures, “mark overs” and “white-out” are not permitted in the original test data sheets.

4. Assembly of the Qualification Test Report

a. The test laboratory will prepare a separate test report for each test report number assigned by DSCC on the DSCC Form 19P "Application/Authorization to Conduct Qualification Test". The test laboratory will then submit to DSCC one original test report. If more than one test laboratory performs tests, the manufacturer will combine the data from each laboratory into one report. Page 3 of the DSCC Form 36F should show all tests in order of the specification test table. The laboratory performing the test can be shown in the remarks column. A separate page 4 of the DSCC Form 36F should be used for each laboratory.

b. All reports will be properly collated and bound, and pages numbered. The test report will consist of the following items:

(1) A completed DSCC Form 36F. Do not omit any of the required information. Page 4 of DSCC Form 36F should list only the equipment used for this qualification test. DSCC Form 36 is not an acceptable substitute for this page. The date of calibration listed on this page should be the last date of calibration prior to this test.

11

(2) A certification of materials, if required by the specification or requested by DSCC.

(3) Design and construction information, if required by the specification or requested by DSCC.

(4) Photographs, when required by the specification or requested by DSCC.

(5) Data sheets in the same order as the listing in the qualification test table(s) of the applicable specification.

(6) Other data or information (e.g., VSWR charts, X-rays, formulae, moisture resistance charts, etc.), if required by the specification or requested by DSCC.

c. One copy of the test report shall be identified on the front cover as the DSCC-VQ original test data copy. This copy differs from the other copies as follows:

(1) The DSCC-VQ original data copy contains the original handwritten sheets in addition to the typed or recopied sheets.

(2) The VQ original test data copy also contains:

(a) Original moisture charts. If the cold subcycle (e.g., step 7a of method 106, MIL-STD-202) is performed in a different chamber, this will be stated on the chart. The chart will also include the following information:

1. Test laboratory name and location

2. Date the chart was recorded

3. Military designation of the product(s) under test.

4. Test report number. (If several tests are performed simultaneously, all test report numbers will be included.)

(b) Image reproductions of the moisture resistance charts will be accepted by DSCC-VQ if it is impractical to submit the original charts. (For example, tests may be performed for several reports simultaneously and it would be impossible to submit the original charts with each test report.) The reproduction will be of the same scale as the original charts. (When the laboratory uses this option, the reason will be stated in the remarks section of the DSCC Form 36F and the reproduced charts annotated to show the report number under which original charts were submitted.)

(c) A photograph or other depiction of the shock wave when required by the DSCC Form 19P.

1. The axes of the illustration are to be properly labeled showing the unit of measure and scale.

12

2. The print should be fastened to a page containing the following information:

a. Name and address of the laboratory conducting the shock test.

b. Date of the test.

c. Test report number.

d. Identification of the test sample, type, number, etc.

e. Overlays and computations which demonstrate compliance.

d. Other photos, diagrams, etc., required by the applicable specification or required by DSCC-VQ.

d. When qualification testing is initiated and then discontinued for any reason, DSCC-VQ is to be notified within 10 working days. If testing is not resumed, a test report covering all testing performed prior to discontinuance must be submitted. Failure to notify DSCC-VQ or to submit this test report by the date agreed is cause for rejection of future applications for qualification testing and may result in loss of laboratory suitability status. If a report covering product failure is submitted and the manufacturer wants to retest, he must submit a new DSCC Form 19P and his proposed corrective action. DSCC-VQ will evaluate the proposed corrective action and if acceptable, will issue a new authorization and test report number.

5. QPL Listing Once a manufacturer has successfully completed qualification testing, the products will be listed on the appropriate QPL. This listing will remain in effect for as long as the product continues to demonstrate compliance with the specification requirements. Compliance includes: successful demonstration of the product's ability to meet the latest specification performance requirements, successful completion of revalidations, proper submittal of all required documentation, continues effectiveness of quality system, etc. In the event that compliance cannot be effectively demonstrated, the manufacturer will be suspended from shipping QPL product until the non-compliance is corrected. The

listing may be discontinued (removed from the QPL) if the manufacturer fails to meet the provisions for qualification listed in DoD 4120.3-M, or if the product fails to meet the performance requirements of the specification.

Products can only be produced in the qualified plant or facility using the approved procedures, equipment, flowcharts, etc. Any changes to the plant location and approved procedures, equipment, flowcharts constitutes a major change which requires immediate notification of the qualifying activity and some type of requalification depending on the extent of the move and/or program change.

SECTION V

CERTIFICATION/QUALIFICATION MAINTENANCE

This section describes the long term relationship between DSCC-VQ and the manufacturer that is required to maintain the certification/qualification status. The items listed below are the basic areas that apply to all qualified product types. Additional requirements and procedures are in the general specification applicable to a particular product.

- Maintain the controls and quality levels for the systems, processes, materials, and products which were audited and approved.
- Build products to the approved flows and procedures.
- Perform self audits for maintaining compliance.
- Keep the qualification listing current and perform qualification testing when required.
- Maintain the quality program plan.
- Notify DSCC-VQ and customers of changes and of failures.
- Keep DSCC-VQ informed of all changes to products, processes, equipment, approved locations, personnel, etc., as applicable to the approved QPL Program. Requalification may be required depending on the change as determined by the qualifying activity.
- Implement all changes (amendments, revisions) to military specifications and standards within the required time frame.

- Perform periodic QCI testing.
- The manufacturer is subject to periodic reaudits by DSCC-VQ. These audits will normally be scheduled at least a month in advance, however, drop-in audits may occur.
- Submit a retention of qualification report to DSCC-VQ as required per the applicable general specification. DSCC-VQ will establish the dates of the reporting period. The report is due at DSCC-VQ no later than 30 days after the end of the period, unless otherwise specified in the military specification. These dates are specified in the first qualification letter to a plant for each specification. A manufacturer who has not been assigned a reporting date for his qualified products should request one from DSCC-VQ.
- When there has been no production, a report must still be submitted which indicates no production has occurred for all qualified styles. If a specification does not contain a retention of qualification requirement (paragraph 4-209 of DoD 4120.3-M), every two years a certification (DD Form 1718) for each plant listed on the QPL is required. The certification will be signed by a responsible official of the company.

14

- Failure to submit this certification by the specified reporting date is cause for removal of the products from the QPL. Paragraph 111.2 of SD-6 provides that the manufacturer need not be notified in advance of the removal. Therefore, it is the manufacturer's responsibility to prepare the certification in time to meet the report due date.
- This report, as a minimum, will cover qualified products and whether or not they were produced for a specified time period. The following information is required on the applicable form or attachments to it:
 1. A list of qualified products that were not produced in the reporting period for which the plant has the capability to produce and wishes to retain on the QPL.
Please include the last lot acceptance date for each product.
 2. A list of qualified products whose production has been discontinued and should be removed from the QPL. When a manufacturer has decided to discontinue production of a product listed on a QPL, DSCC-VQ must be notified immediately, with as much advance notice as possible prior to the end of production.
 3. A statement that the products, which are to remain on the QPL are being or will be made under the same conditions as most recently qualified (i.e., same processes, materials, construction, designs, manufacturers part numbers, or designation) and meets all the requirements of the current issue of the applicable specification.
 4. A separate certification for each applicable general specification and company plant.
 5. The test performed is an indication that all material built since the last acceptable test, was completed and conforms to the requirements of the detail specification. In case of a failure, this product is subject to recall.

SECTION VI

Retention of Qualification Reports

1. Retention of Qualification summary reports shall state, as a minimum, the number of lots which have passed and the number of failures that have occurred. Lots which have failed shall be identified and reasons given for these failures. Disposition of these lots shall be addressed in the summary report.
2. Retention of Qualification periodic test reports shall comply with the requirements of the Qualification Report except:
 - a. DSCC Form 19P is not required.
 - b. DSCC Form 36F is not required but may be used.
 - c. DD Form 1718 is required or equivalent.

In general, all test reports shall meet the same conditions in Section IV of this document, unless otherwise specified by the qualifying activity. This includes submitting original humidity charts (or equivalent), shock photographs, detailed calculations, etc.

3. It will be the responsibility of the manufacturer to notify the Government QAR of the testing schedule for the periodic testing. This can be accomplished either by telephone or by letter. This test schedule shall be acceptable to the QAR. For quality conformance lot testing, it is the function of the QAR to compare the actual raw data against specification requirements and sign-off on the lot summary data submitted to DSCC-VQ. For periodic testing, it should be the responsibility of the QAR to witness and authenticate as many of the required tests that their schedules will permit.

4. Retention of Qualification reports are to be received by this center no later than 30 days from the end of the reporting period, unless otherwise specified by the military specification or as specified by the qualifying activity.

16

SECTION VI
List of Acronyms

- DoD - Department of Defense
- DSCC - Defense Supply Center, Columbus
- DSCC-VQP - Passive Devices Team
- * DD Form 1718 - Certification of Qualified Products
- * DSCC Form 19P - Application/Authorization to Conduct Qualification Test
- * DSCC Form 36 - List of Qualification Test Facilities or List of Quality Conformance Test Facilities
- * DSCC Form 36F - Qualification Test Report at a Non-Government Test Laboratory
- HTML - Hypertext Mark-up Language
- ISA - International Standardization Agreement
- MOU - Memorandum of Understanding
- NATO - North Atlantic Treaty Organization
- POC - Point of Contact

QA - Quality Assurance

QPL - Qualified Products List

SPC - Statistical Process Control

TRB - Technical Review Board

- These forms can be obtained from a separate booklet, or by visiting the VQ web site (see page 2)

17

COMMON AUDIT FINDINGS

This listing of audit findings has been prepared to highlight some of the most common problems found during manufacturer audits conducted by the Passive Devices Team of the Sourcing and Qualifications Unit (DSCC-VQ).

These audit findings are intended to help manufacturers become aware of common audit problems discovered by auditors, and to aid the manufacturer in planning and conducting self-audits.

CAUTION: This list is not intended to give detailed problem scenarios or provide a technical course of action for problems, but rather, contain broad categorization of the problems. Further, it is published to assist manufacturer's self audit teams.

EXAMPLES OF VARIOUS FINDINGS

FINDING # 1: Incorrect Change of Data

Any obliteration of data, use of white out, pencil, tape, erasers, etc., for corrections is not acceptable on any records, including lot travelers, calibration records, C of C, etc. The only acceptable method to change data is to line out the incorrect entry, add the new information, add date of correction and initial of personnel making the change.

FINDING #2: Compliance to Requirements

The manufacturer must establish a quality assurance program that ensures full compliance to all military specification requirements. The Quality Assurance system must include a documentation system (e.g., detail travelers, routing cards) that can clearly and objectively verify that all required processing and testing requirements are met. The manufacturer must also use self auditors or designated QA personnel to routinely verify compliance to all military requirements. CAUTION: Any specification requirement that may be considered technically unwarranted or deemed otherwise unnecessary shall not, under any circumstances, be arbitrarily ignored, deleted or modified by any of the manufacturer's personnel. These specification requirements should be brought to the attention of appropriate government personnel. The qualifying activity will provide a contact point if you do not know how to submit a proposed change.

FINDING #3: Reporting of Failures (Qualification, Group B, Group C)

All failures shall be reported to DSCC-VQ, as they occur, for resolution. Under no circumstances may the manufacturer choose not to report failures.

18

FINDING #4: Communication within engineering and production departments needs to be improved.

- a. Process specifications have not been revised to reflect latest manufacturing operations performed.
- b. Process specifications are not available.
- c. Manufacturing flow charts are incomplete (e.g., manufacturing process, inspection, testing, and document control numbers are not completely identified on the flow).
- d. Manufacturing router is incomplete or incorrect (e.g., missing manufacturing process or more than one manufacturing process included in one operation step).
- e. Manufacturing routers specify incorrect process specification.
- f. Operators are not performing required operations.
- g. Assembly personnel are not verifying completion.
- h. Obsolete or cancelled process specifications were observed in manufacturing areas.
- i. Oven cure time and temperature cannot be verified or are being performed incorrectly. .

j. Tools and fixtures used in manufacturing are not identified or available (e.g., load fixture is not identified for each specification sheet; and one load fixture is used for a specific spec-sheet when two or more load fixtures are needed).

FINDING #5: Calibration System is Not Maintained Properly

a. System evaluating out of tolerance calibration condition is not properly identified, and interval of calibration is not reduced when past calibration history shows equipment out of tolerance.

b. Chamber/oven profile is not available or is done incorrectly.

c. Equipment is not recalibrated within the required calibration schedule (e.g., leak detector is not calibrated every working shift and calibration log is not utilized).

d. There is no segregation of equipment that is out-of-tolerance or past calibration due date from equipment within tolerance.

e. There is no adequate certification or traceability to National Standards.

FINDING #6: ESD Control Procedure is not Documented Properly

a. Wrist strap continuity test record is incomplete; work stations and wrist straps are not identified.

b. Extended frequency of wrist strap continuity test is not justified.

c. The procedure for handling suspect parts between previously successful continuity test and unsatisfactory continuity test is not specified.

19

FINDING #7: Material/production traceability is not documented properly.

The conforming materials identification throughout the production process is incomplete.

FINDING #8: Required Incoming Materials Inspection could not be Verified

a. The purity of gas (e.g. helium) is not verified.

b. An inspection check list is not utilized or shows incomplete inspection steps.

c. Materials requiring measurement data are accepted without supporting data.

FINDING #9: Controlled Storage Area not Maintained for Complete Stock.

a. QPL materials and finished devices are stored with the accepted materials for commercial use only and commercial finished devices.

b. Ink, epoxy, RTV, etc., exceed recommended storage life requirements.

FINDING #10: Quality Conformance Inspection(QCI) Requirements could not be Verified.

a. Improper selection of samples for test (test samples should represent sales and should be selected randomly).

b. There is no positive system for verifying QCI completion prior to product shipment.

FINDING #11: Self Audit Program is not Administered Properly.

a. Incomplete or non-existent self audit program for each area.

b. Corrective actions are not reported to upper management or to the qualifying activity.

c. Follow-up on corrective actions is not performed.

d. Self-audit not taken seriously; insufficient training of auditors; inadequate auditor training records; inadequate resourcing.

e. Auditor checklists are not maintained (evaluated for changes) based on audit findings or specific needs.

f. Reliance on DSCC to determine compliance to the requirements and identify problems instead of depending on the manufacturer's self-audit program. Some manufacturers think their continuous QC program meets the self-audit requirements. Self-audits should be as comprehensive as DSCC audits; should be performed in a 1 or 2 week period per facility; and should be in addition to the ongoing QC function. Survey/audits by other customers does not meet the self-audit requirements.

20

g. Meaningful self-audit summaries are lacking; for example:

(1) areas audited

(2) number of deficiencies for each area and total number of deficiencies

(3) classification of deficiencies (major, minor, repetitive)

(4) trend analysis (current self-audit to previous self-audit and DSCC audit

(5) corrective actions for each discrepancy identified and implemented in a timely manner (in most cases 30 days).

NOTE: A well documented self-audit program will in many cases find, correct, and follow-up deficiencies. This complements DSCC audits; allowing our office to consider extending the interval between DSCC audits.

IMPACT: The certified process can easily change or drift to the point where quality/reliability is questionable. In addition, certification and qualification may be removed for ineffective or lack of self-audits, or more frequent DSCC audits will be required.

FINDING #12: Lack of Procedures and Document Control

a. Process specifications have not been revised to manufacturing operations performed. Manufacturing personnel have performed operations out of sequence when they have determined that the assembly would be less complicated.

b. QCI procedures could not be located at the inspection station.

c. Manufacturing personnel did not have the latest process specification at their assembly area.

d. Manufacturing routers specify incorrect process specifications causing manufacturing flow charts to be inaccurate.

e. Process specifications are identified on manufacturing routers, yet these specifications have not been released to manufacturing.

FINDING #13: Test Equipment Discrepancies

a. Tools and fixtures used in manufacturing are not identified.

b. Test equipment used in QCI has not been recalibrated, yet is being used for testing of product.

c. Test equipment out of calibration has not been segregated.

d. Certifications of calibration records could not be located. (See Finding #3).

e. Correlation between test equipment is nonexistent or inadequate.

FINDING # 14: Discrepancies in Manufacturing Processes and Procedures

a. Operators do not log oven cure time on logs or manufacturing routers.

21

b. Personnel are not stamping off the completion of performed operations.

c. Personnel are not performing operations and inspections required by the routers or military specification.

d. Testing is not done in accordance with military standard.

e. Log books are not kept up to date.

f. Controlled storage area is not available for completed product.

FINDING #15: Test Equipment Problems

Test equipment malfunction being assumed when failures occur is not an acceptable practice. All indicated failures must be reported to DSCC-VQ and an analysis of the problem and a course of action will be decided. Assuming test equipment malfunction without verification is not a valid failure analysis.

FINDING #16: Selection of QCI Samples

Samples used for retention testing (Groups B, C, and D) must be representative of production that occurred during the retention period. Use of special lots is not an acceptable practice. Samples shall represent part numbers, styles, processes, equipment, operators, materials, and all Group A lots produced during that period. Samples shall represent part numbers, styles, processes, equipment, operators, materials, and all Group A lots produced during that period.

IMPACT: Most of these findings indicate a lack of control, but items such as out of date process specifications, failure to verify QCI, incorrect routers, calibration discrepancies, etc. could easily affect product quality. These types of discrepancies can go unnoticed until a major quality problem appears, at which time recognition may be too late. Regular DSCC audits and manufacturer self-audits will find and correct these problems quickly, and help keep manufacturers aware of the areas that should be more frequently monitored.

FINDING #17 Statistical Process Control (SPC) Programs

a. Many manufacturers have not yet taken the SPC requirements seriously as a tool that can be used to accelerate continual process improvements into the manufacturing operations and products.

b. Many manufacturers have not yet established comprehensive SPC plans with realistic and achievable milestones.

We realize that military specifications are in various stages of including SPC. However, we feel all manufacturers should be reviewing their product line and manufacturing operations in order to develop SPC plans that will foster continual improvements.

FINDING #18: Training Program

a. There is no training records for all personnel involved in the manufacture and testing of military product.

b. No re-evaluation of training is established.