

INCH-POUND

MIL-DTL-55330D
 14 March 2014
 SUPERSEDING
 MIL-DTL-55330C
 8 JUNE 2001

DETAIL SPECIFICATION

CONNECTORS, ELECTRICAL AND FIBER OPTIC, PACKAGING OF

This specification is approved for use by all
 Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements for the preservation, packing, and container marking of all types of electrical and fiber optic connectors (including interconnectors, splices, couplers, splitters, mixers, and associated accessories) which are primarily classified under Federal Supply Classes (FSC's) 5935, 6005, and 6060 (see 6.1).

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

FEDERAL SPECIFICATIONS

PPP-B-566	-	Boxes, Folding, Paperboard.
PPP-B-676	-	Boxes, Setup.

FEDERAL STANDARD

FED-STD-123	-	Marking for Shipment (Civil Agencies).
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Comments, suggestions, or questions on this document should be addressed to DLA Land and Maritime, ATTN: VAI, P.O. Box 3990, Columbus OH 43218-3990 or emailed to circularconnector@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.dla.mil>.

AMSC N/A

AREA PACK

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DEPARTMENT OF DEFENSE STANDARDS

- MIL-STD-129 - Military Marking for Shipment and Storage.
- MIL-STD-147 - Palletized Unit Loads.
- MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts.
- MIL-STD-2073-1 - Standard Practice for Military Packaging.

(Copies of these documents are available online at <http://quicksearch.dla.mil>.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

AMERICAN SOCIETY FOR QUALITY (ASQ)

- ASQC-Z1.4 - Procedures, Sampling and Tables for Inspection by Attributes.

(Copies of this document is available online at <http://www.asq.org> or from the American Society for Quality, 600 North Plankinton Ave., Milwaukee, Wisconsin, 53203.)

ASTM INTERNATIONAL

- ASTM-D1974/D1974M - Fiberboard Boxes, Methods of Closing, Sealing, and Reinforcing, Standard Practice for.
- ASTM-D3951 - Packaging, Commercial.
- ASTM-D3953 - Steel and Seals, Flat, Strapping.
- ASTM-D6251/D6251M - Natural Wood-Cleated Panelboard Shipping Boxes.
- ASTM-D6880/D6880M - Standard Specification for Wood Boxes.

(Copies of these documents are available at <http://www.astm.org> or from ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania 19428-2959.)

NCSL INTERNATIONAL

- NCSL-Z540.3 - Calibration of Measuring and Test Equipment, Requirements for.

(Copies of these documents are available online at <http://www.ncsli.org> or from NCSL International, 2995 Wilderness Place, Suite 107, Boulder, Colorado 80301-5404.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 General. The packaging terms used herein shall be in accordance with the definitions listed in MIL-STD-129 and MIL-STD-2073-1. The following general requirements apply, as applicable, to military or commercial packaging, as well as to shipments to non-government activities.

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3.1.1 Hardware. Mounting brackets, screws, and other hardware accompanying or furnished with the connectors shall be protected and enclosed within the unit packs in a manner that will not damage the connectors or the packaging materials. When practical, the hardware should be mounted on each connector.

3.1.2 Physical protection. Connectors and accessories shall be packaged in a manner that will ensure compliance with the applicable requirements of MIL-STD-2073-1 as well as those specified herein. For shipments to non-government activities, large quantity unit packs may be used.

3.1.2.1 Contacts, leads, and terminals. Contacts, leads, terminals, and other outward projections shall be protected by means of container design, noncorrosive die-cut inserts, or other suitable supporting materials or devices. If not otherwise protected, protective caps shall be used to prevent damage to the coupling or accessory connector threads.

3.1.2.2 Wrapping and cushioning. Wrapping and cushioning materials shall be noncorrosive and dry. In addition, materials used for fiber optic connectors shall be non-static generating and shall not crumble, flake, powder or shed. Cushioning is not required for accessories.

3.1.3 Exterior containers. Exterior containers shall be of minimum tare weight and cube consistent with the protection required and shall contain quantities of identical stock numbered or otherwise designated items to the greatest extent practicable (see 3.3).

3.2 Preservation. Preservation shall be military or commercial, as specified (see 6.2).

3.2.1 Military.

3.2.1.1 Cleaning. Connectors and accessories shall be cleaned in accordance with MIL-STD-2073-1.

3.2.1.2 Drying. Connectors and accessories shall be dried in accordance with MIL-STD-2073-1.

3.2.1.3 Preservatives. Contact preservatives shall not be used.

3.2.1.4 Unit packs.

3.2.1.4.1 Connectors. Unless otherwise specified (see 6.2), and except as specified herein, connectors (both electrical and fiber optic) shall be individually unit packed in accordance with MIL-STD-2073-1, method 41. Electrical connectors with only gold plated contacts shall be preserved in accordance with MIL-STD-2073-1, method 31.

3.2.1.4.1.1 Connectors with removable contacts. Removable crimp type contacts shall not be installed in the connector insert but shall be placed in a close fitting noncorrosive rigid container such as a vial or box and enclosed within the unit pack. Any spare contacts furnished shall also be within this container.

3.2.1.4.1.2 Connectors with grommet sealing plugs. Grommet sealing plugs supplied with various connectors shall be placed in an envelope or rigid container and enclosed within the unit pack.

3.2.1.4.2 Accessories (when acquired separately).

3.2.1.4.2.1 Contacts. Unless otherwise specified (see 6.2), contacts shall be unit packed five each in accordance with MIL-STD-2073-1, method 41.

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3.2.1.4.2.2 Other accessories. Other accessories such as adapters (mechanical), boots, caps, clamps, covers, elbows, grommet sealing plugs, nuts, rings, and tools shall be unit packed in accordance with MIL-STD-2073-1, method 10. Unit pack quantities for other than "one each" shall be as specified (see 6.2).

3.2.1.4.2.3 Supplementary containers. Connectors and accessories, unit packed as specified in 3.2.1.4.1 and 3.2.1.4.2, with a unit pack volume of 30 cubic inches (491.7 cubic centimeters) or more, or an item dimension 4 inches (10.16 centimeters) or longer shall be placed in a supplementary container conforming to variety 2 of PPP-B-566 or PPP-B-676.

3.2.1.5 Intermediate packs. When the unit pack is a bag of any type or the unit pack is less than 64 cubic inches (1,049 cubic centimeters), uniform quantities of connectors or accessories of the same National Stock Number (NSN) shall be placed in intermediate containers conforming to variety 2 of PPP-B-566, or variety 2 of PPP-B-676; or ASTM-D1974/D1974M, class weather resistant. Alternatively, non-weather or non-water resistant versions of these containers may be used provided they are overwrapped with waterproof barrier materials. Intermediate containers shall contain multiples of five unit packs not to exceed 100 unit packs. No intermediate packs are required when the total quantity shipped to a single destination will result in only one intermediate pack per shipping container.

3.2.2 Commercial. Commercial preservation shall be in accordance with ASTM-D3951.

3.3 Packing. Packing shall be level A, B, or minimal, as specified (see 3.1 and 6.2).

3.3.1 Level A. Connectors and accessories, preserved as specified in 3.2, shall be packed in wood containers conforming to ASTM-D6251/D6251M, overseas type or ASTM-D6880/D6880M, class 2. Closure and strapping shall be in accordance with the applicable container specification except that metal strapping shall conform to ASTM-D3953. The requirements for level B packing shall be used when the total quantity of a stock numbered connector or accessory for a single destination does not exceed a packed volume of 1 cubic foot (0.02832 cubic meter).

3.3.2 Level B. Connectors and accessories, preserved as specified in 3.2, shall be packed in fiberboard containers conforming to ASTM-D1974/D1974M, class weather resistant, style optional, and special requirements. The requirements for box closure, waterproofing and reinforcing shall be in accordance with ASTM-D1974/D1974M.

3.3.3 Minimal. Connectors and accessories, preserved as specified in 3.2, shall be packed in fiberboard containers conforming to ASTM-D1974/D1974M, class domestic, style optional, and special requirements. Closures shall be in accordance with ASTM-D1974/D1974M.

3.3.4 Unitized loads. Unless otherwise specified (see 6.2), unitized loads, commensurate with the level of packing specified in the contract or purchase order, shall be used whenever total quantities for shipment to one destination equal 40 cubic feet (1.1328 cubic meters) or more. Quantities less than 40 cubic feet need not be unitized. Unitized loads shall be uniform in size and quantities to the greatest extent practicable.

3.3.4.1 Level A. Connectors, packed as specified in 3.3.1, shall be unitized on pallets in conformance with MIL-STD-147 with a wood cap (storage aid 5) positioned over each load.

3.3.4.2 Level B. Connectors, packed as specified in 3.3.2, shall be unitized as specified in 3.3.4.1, except that weather resistant fiberboard caps (storage aid 4) shall be used in lieu of wood caps.

3.3.4.3 Minimal. Connectors, packed as specified in 3.3.3, shall be unitized as specified in 3.3.4.2 except that the fiberboard caps shall be class domestic.

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3.4 Marking. The following marking is mandatory for shipments both to U.S. Government and non-government activities.

3.4.1 Standard marking. In addition to any special or other identification marking required by the contract (see 6.2), each unit, supplementary, intermediate, and exterior container and unitized load shall be marked in accordance with MIL-STD-129. The complete military or contractor's type or Part or Identifying Number (PIN), as applicable, including the Commercial and Government Entity (CAGE) code, shall be marked on all unit and on intermediate packs in accordance with the identification marking provisions of MIL-STD-129. When specified in the contract (see 6.2), the marking of domestic shipments for civil agencies shall be in accordance with FED-STD-123.

3.5 First article and quality conformance inspections. First article and quality conformance inspections and tests shall be required as specified in 4.3 and 4.4 respectively. Samples for these tests shall be furnished in accordance with the procedures outlined in 4.3 and 4.4. The performance of the visual and dimensional inspections, rough handling tests, and leakage tests shall conform to the inspections and tests outlined in 4.6.1, 4.6.2.1, and 4.6.2.2, respectively.

3.5.1 Functional requirements.

3.5.1.1 Rough handling test (when specified, see 6.2). When packs have been tested in accordance with 4.6.2.1, all materials and components comprising each pack shall be free from damage or evidence of misplacement which might affect the utility of the preservation method or pack. The connectors and associated accessories within the tested packs shall show no visible signs of damage. When specified in the contract (see 6.2), functional tests in accordance with the group A inspection requirements of the applicable commodity specification shall be conducted on those connectors subjected to the rough handling tests to determine freedom from operational malfunction. The examination of the connectors tested under this group A inspection shall be in accordance with the visual and mechanical inspection requirements specified in the applicable connector commodity specification.

3.5.1.2 Leakage test (when applicable). When a barrier enclosed unit pack has been tested in accordance with 4.6.2.2, there shall be no evidence of moisture within the unit pack.

3.6 Workmanship. The quality of workmanship shall assure acceptance of the completed preservation, packing, and marking requirements in accordance with the inspections specified in section 4.

3.7 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

4. VERIFICATION

4.1 Classification of inspections. The inspections specified herein are classified as follows:

- a. First article inspection (see 4.3).
- b. Conformance inspection (see 4.4).
- c. Materials inspection (see 4.5).

4.2.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspection shall be established and maintained by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with NCSL-Z540.3.

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4.2.2 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in the general requirements of MIL-STD-202.

4.3 First article inspection. When specified (see 6.2), first article inspection shall be performed by the contractor, after award of contract and prior to production at a time and location acceptable to the Government.

First article inspection shall not be required if one or more of the following conditions are met:

- a. When there have been no changes in materials, processes, or packaging design that will adversely affect item protection since the last recorded inspection.
- b. When the detailed packaging instructions are furnished by the acquisition activity.
- c. When minimal protection is specified.
- d. When a prior successful inspection was conducted on a like item and pack (subject to the approval of the administrative contracting officer).

4.3.1 Sample size. One sample unit consisting of a military preservation, as applicable, fully packed shipping container shall be submitted for first article inspection. The sample for the rough handling test shall consist of the pack selected for first article inspection. The sample for the leakage test shall be five unit packs selected at random from the first article exterior pack (shipping container).

4.3.2 Inspection routine. The sample shall be subjected to the inspections specified in tables I and II. The leakage test, when applicable, shall follow the rough handling test.

4.3.3 Failures. One or more failures shall be cause for refusal to grant first article approval.

4.3.4 Resubmission of first article sample. If the sample fails to pass first article inspection, the contractor shall change the preservation and packing processes to correct the cause of the deficiency. First article inspection shall be performed on a corrected sample to prove that the corrective action is acceptable.

4.4 Conformance inspection. This inspection shall consist of the inspections and tests specified in tables I and II, respectively.

TABLE I. Visual and dimensional inspection.

Inspection	Requirement paragraph	Method paragraph
Uncleaned or improperly cleaned items	3.2.1.1 and 3.2.1.2	4.6.1
Punctured or improperly fabricated barrier bag	3.2.1.4.1 and 3.2.1.4.2	
Incorrect preservation method	3.2.1.4.1 and 3.2.1.4.2	
Wrong quantity per unit pack	3.2.1.4.1 and 3.2.1.4.2	
Non-use or incorrect application of intermediate containers	3.2.1.5	
Improper box closures	3.3.1 and 3.3.2	
Omitted, incorrect or illegible marking	3.4	

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TABLE II. Functional inspection.

Test	Requirement paragraph	Method paragraph
Rough handling (when specified)	3.5.1.1	4.6.2.1
Leakage (when applicable)	3.5.1.2	4.6.2.2

4.4.1 Inspection lot. An inspection lot shall consist of unit or exterior (shipping) packs produced under essentially the same conditions and offered for inspection at one time. For the purpose of selecting samples to be inspected and tested for compliance with the requirements of this specification, either items in process or completed packs, except as stated herein, may be combined into lots without regard to individual items, contracts, or the quantities therein. Unit packs of the same size and made from the same packaging materials may be grouped together except when item complexity, item value, or the complexity of the preservation method warrants that the inspection of such items be performed on a separate basis. A separate application of the sampling or inspection procedure shall be made on these items. The combination of items to be subjected to inspection shall be determined by either the government or the contractor, subject to the approval of the Government.

4.4.2 Visual and dimensional inspection. Visual and dimensional inspection shall consist of those inspections specified in table I.

4.4.2.1 Sampling plan. Statistical sampling and inspection shall be in accordance with ASQC-Z1.4. There shall be no failures for all inspections of table I combined.

4.4.2.2 Rejected lots. If an inspection lot is rejected, the contractor may rework it to correct the defects, or screen out the defective units, and resubmit for reinspection. Resubmitted lots shall be inspected using tightened inspection. Resubmitted lots shall be separate from new lots, and shall be clearly identified as reinspected lots.

4.4.2.3 Disposition of sample units. Sample units which have passed all the inspections specified in table I may be delivered on the contract, provided the lot is accepted.

4.4.3 Functional inspection. Functional inspection shall consist of the tests specified in table II.

4.4.3.1 Sampling plan. Sampling plans shall be as follows:

One sample unit for the rough handling test shall be selected whenever the design of the item or package is changed.

For unit packs requiring waterproof or water-vaporproof barriers, five sample units for the leakage test shall be selected daily at random from the first lot processed each day. Five additional samples shall be selected at random from the day's total production.

The leakage test shall also be performed following the rough handling test on unit packs requiring waterproof or water-vapor proof barriers. Five sample units or the number of units contained within the shipping container (if less than five) shall be selected.

4.4.3.2 Failures. One or more failures shall be cause for rejection of the lot.

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4.4.3.3 Disposition of sample units. Sample units which have passed the inspections specified in table II may be delivered on the contract if the lot is accepted and opened packs have been reprocessed.

4.4.3.4 Noncompliance. If a sample fails to pass the inspections specified in table II, the contractor shall take corrective action on the materials or processes or both, as warranted, on all unit, intermediate, and exterior (shipping) packs which can be corrected and which were processed under essentially the same conditions, with essentially the same materials, and which are considered subject to the same failure. Acceptance of the unit, intermediate, and exterior packs shall be discontinued until corrective action has been taken and the applicable inspections specified in table II have been repeated on additional sample units. All inspections, or the inspection which the original sample failed, shall be at the option of the Government. Inspections specified in table II may be reinstated; however, final acceptance shall be withheld until the reinspection in accordance with table II has shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure and corrective action taken shall be furnished to the administrative contracting officer.

4.5 Materials inspection. Materials inspection shall consist of certification supported by verifying data that the materials used are in accordance with the applicable requirements specified herein.

4.6 Methods of inspections and tests.

4.6.1 Visual and dimensional inspections. Unit, intermediate, and exterior packs shall be examined to verify that the materials, Designs, methods, physical limitations, marking, and workmanship are in accordance with the applicable requirements (see 3.1 through 3.6). Nonconformance is defined as one or more defects as listed in table I.

4.6.2 Functional tests.

4.6.2.1 Rough handling. Packs shall be subjected to the applicable rough handling tests and the interpretation of results or cause for rejection as specified in 3.5.1.1 and MIL-STD-2073-1.

4.6.2.2 Leakage. When a waterproof or water-vaporproof barrier is required, the unit pack shall be subjected the applicable leakage test and interpretation of results specified in 3.5.1.2 and MIL-STD-2073-1.

5. PACKAGING

5.1 Packaging requirements. This section is not applicable to this specification.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The preservation, packing, and marking specified herein are intended for direct shipments to the Government. Unless otherwise designated, the general requirements (3.1) and marking requirements (3.4) are applicable for the preparation of military specification connectors and accessories for shipment from the parts manufacturer to non-Government activities.

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6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Levels of preservation and packing (see 3.2 and 3.3).
- c. Quantity per unit pack, if other than specified (see 3.2.1.4.1, 3.2.1.4.2.1, and 3.2.1.5.2.2).
- d. Method of preservation, if other than that specified (see 3.2.1.4.1 and 3.2.1.4.2.1).
- e. If a unitized load is not required for shipment to one destination when total quantities are equal to 40 cubic feet or more (see 3.3.4).
- f. Whether any special marking or additional identification marking is required (see 3.4.1).
- g. If FED-STD-123 is required for civil agency marking (see 3.4.1).
- h. If a rough handling test is required (see 3.5.1.1).
- i. If connector functional tests are required (see 3.5.1.1).
- j. If the contractor is not responsible for the performance of all inspection requirements (see 4.1).
- k. If first article inspection is not required (see 4.4).

6.3 Inspection for first article. The sample pack submitted for first article inspection (when satisfactorily performed as specified in 4.4) will serve as the production standard for subsequent packaging operations. The contractor should inform the acquisition activity or the activity administering the contract of the time and location of this specification so that the Government representative will have an opportunity to witness the tests.

6.4 Subject term (key word) listing.

Connector accessories
Marking
Packing
Physical protection
Preservation
Unitized loads

6.5 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmental Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals and additional information is available on their website at <http://www.epa.gov/osw/hazard/wastemin/priority.htm>. Included in the list of 31 priority chemicals are cadmium, lead, and mercury. Use of these materials should be minimized or eliminated unless needed to meet the requirements specified herein (see section 3).

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

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CONCLUDING MATERIAL

Custodians:

Army - CR

Navy - EC

Air Force - 99

DLA - CC

Preparing activity:

DLA - CC

(Project PACK-2013-005)

Review activities:

Army – MI, SM

DLA - DH

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil>.