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MILITARY SPECIFICATION

ELECTRON TUBES, 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 electron tubes and associated accessories (see 6.1).

1.2 Classification. The electron tubes covered by this specification shall be included within the following packaging groups.

1.2.1 Packaging group 1. Receiving tubes and other electron tubes or devices which do not exceed a 6 by 6 by 15 inch (15.24 by 15.24 by 38.1 centimeters) unit pack size.

1.2.2 Packaging group 4. Cathode ray, picture, storage, and related tube types.

1.2.3 Packaging group 9. Magnetron and other electron tubes containing permanent magnets.

1.2.4 Packaging group 23. Electron tubes (except receiving, magnetron, cathode ray and related tube types) which do not exceed an 18 by 18 by 40-inch (45.72 by 45.72 by 101.6 centimeters) unit pack size.

1.2.5 Packaging group 24. Electron tubes exceeding an 18 by 18 by 40-inch unit pack size.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

QQ-S-781	- Strapping, Steel, and Seals.
PPP-B-566	- Boxes, Folding, Paperboard.
PPP-B-601	- Boxes, Wood, Cleated-Plywood.
PPP-B-621	- Boxes, Wood, Nailed and Lock-Corner.
PPP-B-636	- Boxes, Shipping, Fiberboard.
PPP-B-640	- Boxes, Fiberboard, Corrugated, Triple-Wall.
PPP-B-676	- Boxes, Setup.
PPP-F-320	- Fiberboard, Corrugated and Solid, Sheet Stock (Container Grade), and Cut Shapes.

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MIL-E-1	- Electron Tubes, General Specification For.
MIL-P-116	- Preservation, Methods of.
MIL-S-4473	- Shielding of Magnetron Tubes and Magnets for Air Shipment.
MIL-D-6054	- Drum, Metal-Shipping and Storage.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Space and Naval Warfare Systems Command, ATTN: Code 8111, Department of the Navy, Washington D.C. 20363 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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STANDARDS

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MIL-STD-105	- Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129	- Marking for Shipment and Storage.
MIL-STD-147	- Palletized Unit Loads.
MIL-STD-202	- Test Methods for Electronic and Electrical Component Parts.
MIL-STD-1185	- Cushioning, Anchoring, Bracing, Blocking, and Water-proofing; with Appropriate Test Methods.
MIL-STD-2073-1	- DoD Materiel, Procedures for Development and Application of Packaging Requirements.
MIL-STD-45662	- Calibration System Requirements

(Copies of specifications, and standards, required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, specification (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede 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-2073-1. The following general requirements apply, as applicable, to levels A, B, and C.

3.1.1 Pairs and sets. Electron tubes furnished in pairs or sets under one national stock number (NSN) shall be unit packed as one pair or one set, as applicable. When individual unit packs are used to make up a pair or set of tubes, they shall not be taped or glued together but shall be enclosed within a close fitting, unit container.

3.1.2 Hardware. Hardware accompanying electron tubes shall be protected and enclosed within the unit packs in a manner that will not damage the electron tubes or packaging materials. When practical, the hardware should be mounted on each electron tube.

3.1.3 Physical protection. Electron tubes and accessories shall be packaged in a manner that will ensure compliance with the applicable requirements of MIL-P-116 as well as those specified herein.

3.1.3.1 Pins, leads, terminals, and waveguide mounting surfaces. Pins, leads, terminals, and other outward projections shall be protected by means of container design or noncorrosive die-cut inserts or other suitable supporting materials or devices. Waveguide mounting surfaces shall be protected with tight-fitting plastic covers, caps, or other suitable protective materials.

3.1.3.2 Wrapping and cushioning. Wrapping and cushioning materials shall be noncorrosive and dry. The use of hygroscopic or loose fill materials is prohibited for shipboard applications.

3.1.3.3 Blocking and bracing. Blocking and bracing shall conform to the applicable provisions of MIL-STD-1186.

3.1.4 Design and construction. Interior and exterior packs shall be of the design and construction specified herein. Exterior containers shall be of minimum tare and cube consistent with the protection required and shall contain equal quantities of identical stock numbered or otherwise designated items to the greatest extent practicable.

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3.1.5 Army acquisitions.

3.1.5.1 Levels A, B, and C unit packs. The quantity per unit pack (QUP) shall be one, unless otherwise specified (see 6.2). Unit and supplementary containers conforming to PPP-B-636, class weather-resistant shall be utilized in lieu of PPP-B-566 or PPP-B-676 containers.

3.1.5.2 Levels A, B, and C intermediate packs. Electron tubes, unit packed in containers less than 64 cubic inches and bearing the same NSN, shall be placed in intermediate containers conforming to PPP-B-636, class weather-resistant. Level C intermediate containers shall conform to PPP-B-636, class domestic. Intermediate containers shall not exceed 40 pounds (18.144 kilograms) net weight, or a maximum size of 1.5 cubic feet (0.04248 cubic meter) with at least two dimensions not exceeding 16 inches (40.64 centimeters). Intermediate containers shall not be required when the total quantity to be shipped will result in only one intermediate pack per shipping container.

3.1.5.3 Levels A, B, and C packing. For wood containers conforming to PPP-B-601 or PPP-B-621, when the gross weight exceeds 200 pounds (90.72 kilograms), or the container length and width is 48 x 24 inches (121.92 x 60.96 centimeters) or more and the weight exceeds 100 pounds (45.36 kilograms), 3 x 4 inch (7.62 x 10.16 centimeters) skids (laid flat) shall be applied in accordance with the requirements of the container specification. Palletization shall be required when containers specified in 3.3.1, 3.3.2, and 3.3.3 do not require skids; quantities per destination exceed either a total of 250 pounds or 113.4 kilograms (excluding the pallet) or a volume of 20 cubic feet (0.05663 cubic meter); and the container size permits use of one of the pallet patterns of MIL-STD-147. A quantity of containers, packed as specified, except that container strapping may be omitted, shall be placed on a pallet, load type I conforming to MIL-STD-147. For levels B and C, unit or intermediate containers which meet these requirements may be palletized without further packing. The pallet shall conform to NN-P-71, type IV, group I or II woods. The load shall be "bonded" to the pallet by strapping conforming to QQ-S-781, type I, finish A, or shrink film conforming to L-P-378, type IV. Stretch wrap in accordance with MIL-STD-147 is authorized for shipments within the continental United States and for containerized shipments.

3.2 Preservation. Preservation shall be in accordance with level A, B, or C, as specified (see 6.2).

3.2.1 Level A.

3.2.1.1 Cleaning. Electron tubes and accessories shall be cleaned in accordance with MIL-P-116, process C-1.

3.2.1.2 Drying. Electron tubes and accessories shall be dried in accordance with MIL-P-116.

3.2.1.3 Preservatives. Contact preservatives shall not be used.

3.2.1.4 Unit packs.

3.2.1.4.1 Packaging group 1 (see 1.2.1). Except as specified herein, receiving tubes and other miscellaneous small electron tubes shall be individually unit packed in accordance with method III of MIL-P-116. Those that are tunable or adjustable or with silver plated contacts or surfaces shall be unit packed in accordance with submethod IA-8 of MIL-P-116. Flexible cushioning material or die-cut devices shall be used to protect each tube having fragile projections (not including sealed off tips and pins). The unit container for method III protection and the supplemental container for submethod IA-8 shall conform to variety 2 of PPP-B-566 or PPP-B-676 for unit packs less than 5 by 5 by 12 inches (12.7 by 12.7 by 30.48 centimeters) or 300 cubic inches (4,916 cubic centimeters). Containers exceeding this size shall conform to PPP-B-636, class weather-resistant.

3.2.1.4.2 Packaging group 4 (see 1.2.2). Cathode ray and related electron tube types shall be individually unit packed in accordance with method III of MIL-P-116. Resilient pads, corner blocks, or die-cut devices conforming to type CF, class

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domestic of PPP-F-320 shall be used to centrally position the tube within each unit pack in a manner to prevent physical damage to the tube from shock and vibration and to prevent tip seals from coming in contact with the container. The unit container shall conform to PPP-B-636, class weather-resistant.

3.2.1.4.3 Packaging group 9 (see 1.2.3). Except as specified herein, magnetron and other electron tubes having permanent magnets shall be preserved in accordance with method III of MIL-P-116. Unless otherwise specified in the contract or purchase order (see 6.2), those tubes that are tunable or adjustable or have silver plated contacts or surfaces shall be preserved in accordance with submethod IA-8 of MIL-P-116 with a supplementary container. The distance between the outer magnetic surfaces and the outside of the unit container shall be no less than the protective distance required in the precautionary handling or magnetic isolation instruction in the MIL-E-1 detail specification or manufacturer's tube specification, as applicable. When special instructions are not available, a minimum protective distance of 4 inches shall be maintained. Cushioning, blocking, and bracing shall be as specified herein. The supplementary container shall conform to PPP-B-636, class weather-resistant or, when these box requirements are exceeded, to PPP-B-640, class 2. When specified in the contract or purchase order (see 6.2) or by transportation rules and regulations, magnetic shielding shall be applied in accordance with MIL-S-4473. When shielding is required, submethod IId of MIL-P-116, using sealed metal drums which meet the MIL-S-4473 shielding requirements and the magnetic isolation distances specified herein, may be used in lieu of the preservation and unit container requirements described above.

3.2.1.4.4 Packaging group 23 (see 1.2.4). Except as specified herein, electron tubes (except receiving, magnetron, cathode ray, and related tube types) having a container size ranging from 6 by 5 by 15 inches (15.2 by 15.2 by 38.1 centimeters) to 18 by 18 by 40 inches (45.7 by 45.7 by 101.6 centimeters) shall be preserved in accordance with method III of MIL-P-116. Unless otherwise specified in the contract or purchase order (see 6.2), electron tubes that are tunable or adjustable or have silver plated contacts or surfaces shall be preserved in accordance with MIL-P-116, submethod IA-8 with a supplementary container, or submethod IA-14. Cushioning, blocking, and bracing shall be as specified herein. The unit container shall conform to PPP-B-636, class weather-resistant.

3.2.1.4.5 Packaging group 24 (see 1.2.5). Except as specified herein, electron tubes exceeding an 18 by 18 by 40-inch (45.7 by 45.7 by 101.6 centimeters) unit pack size shall be preserved in accordance with method III of MIL-P-116. Electron tubes that are tunable or adjustable or have silver plated contacts or surfaces shall be preserved in accordance with submethod IIb or IId of MIL-P-116. Cushioning, blocking, and bracing shall be applied as specified herein. The unit container shall conform to PPP-B-601, overseas type or PPP-B-621, class 2.

3.2.1.4.6 Accessories (when separately acquired). Accessories, such as shields, retainers, and adapters, shall be unit packed one each in accordance with MIL-P-116, method III. Unit pack quantities for other than one each shall be as specified (see 6.2). The unit container for items exceeding 1 inch (2.54 centimeters) in the smallest overall dimension shall conform to variety 2 of PPP-B-566 or PPP-B-676.

3.2.1.5 Intermediate packs. Electron tubes, unit packed in containers less than 30 cubic inches in size (see 3.2.1.4.1), shall be further packaged in units of five packs each in an open top box or sleeve which provides a sufficiently tight fit to prevent the individual unit packs from falling out during handling. Accessories, which are not unit packed in boxes (see 3.2.1.4.6), shall be placed in intermediate containers conforming to variety 2 of PPP-B-566 or PPP-B-676. All intermediate containers shall be uniform in size, shape, and quantities, and shall be of minimum tare and cube and shall contain multiples of 5 unit packs, not to exceed 100 unit packs. No intermediate packs are required when the total quantity shipped to a single destination is less than 100 unit packs.

3.2.2 Level B. Except as specified herein, the level B preservation for electron tubes and accessories is identical to that specified for level A. For packaging groups 1, 4, 9, and 23, nonweather (or nonwater) resistant versions of the PPP-B-566, PPP-B-676, PPP-B-636, or PPP-B-640 unit containers specified for level A shall be used. For packaging group 24, unit containers conforming to PPP-B-601, domestic

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type; PPP-B-621, class 1; PPP-B-636, class weather-resistant (not to exceed the limits of the box specification); or PPP-B-640, class 2 may be used as the unit container when level B or C is specified for packing.

3.2.3 Level C. The level C preservation for electron tubes and accessories shall conform to the MIL-STD-2073-1 requirements for this level. Unless otherwise specified in the contract (see 6.2), the quantity per unit pack shall be at the option of the supplier.

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

3.3.1 Level A.

3.3.1.1 Packaging groups 1, 4, 9, 23 and accessories. Electron tubes and accessories, preserved as specified in 3.2, shall be packed in wood containers conforming to PPP-B-601, overseas type or PPP-B-621, class 2. Closure and strapping shall be in accordance with the applicable container specification, except that metal strapping shall conform to QQ-S-781, type 1, finish A. The requirements for level B packing shall be used when the total quantity of a stock numbered electron tube or accessory for a single destination does not exceed a packed volume of one cubic foot (0.02832 cubic meter).

3.3.1.2 Packaging group 24. The unit container for each electron tube unit packed as specified in 3.2.1.4.5 will serve as the shipping container. For electron tubes with level B or C preservation, the shipping container shall conform to that specified for the level A unit container. Closure, waterproofing, and banding (reinforcement requirements) shall be in accordance with the applicable container specification for level A. When necessary to facilitate handling, a weather (or water) resistant skid or pallet base shall be applied in accordance with the applicable box specification, or if not specified, in a manner which will adequately support the enclosed tube and facilitate the use of material handling equipment.

3.3.2 Level B.

3.3.2.1 Packaging group 1 and accessories. Electron tubes and accessories, preserved as specified in 3.2, shall be packed in fiberboard containers in accordance with PPP-B-636, class weather-resistant, style optional, special requirements. The requirements for box closure, waterproofing, and reinforcing shall be in accordance with method V of the PPP-B-636 appendix. Unit containers conforming to PPP-B-636, class weather-resistant, special requirements require no further packing provided that the requirements for closure, waterproofing, and reinforcing specified herein are met.

3.3.2.2 Packaging groups 4, 9, and 23 - not exceeding one cubic foot. Unit packs in packaging groups 4, 9, and 23 with a packed volume not exceeding one cubic foot shall be packed as specified for packaging group 1 (see 3.3.2.1).

3.3.2.3 Packaging groups 4, 9, and 23 - exceeding one cubic foot. The level A unit container for these packaging groups will suffice as the shipping container. For electron tubes with level B or C preservation, the shipping container shall conform to that specified for the level A unit container in the applicable packaging group. Closure, waterproofing, and banding (reinforcement requirements) shall be in accordance with the applicable container specification for level B shipment.

3.3.2.4 Packaging group 24. The unit container for each electron tube unit packed as specified in 3.2.1.4.5 or 3.2.2 will serve as the shipping container. For electron tubes with level C preservation, the shipping container shall conform to that specified for the level B unit container. Closure shall be in accordance with the applicable container specification for level B. When necessary to facilitate handling, a skid or pallet base shall be applied in accordance with the applicable box specification, or if not specified, in a manner which will adequately support the enclosed tube and facilitate the use of material handling equipment.

3.3.3 Level C.

3.3.3.1 Packaging group 1 and accessories. Packaged electron tubes and accessories shall be packed in fiberboard containers conforming to PPP-B-636, class domestic, style optional, special requirements. Closures shall be in accordance with the PPP-B-636 appendix.

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3.3.3.2 Packaging groups 4, 9, and 23 - not exceeding one cubic foot. Electron tubes in unit containers specified for packaging groups 4, 9, or 23 with a packed volume not exceeding one cubic foot shall be packed as specified for packaging group 1 (see 3.3.3.1).

3.3.3.3 Packaging groups 4, 9, and 23 - exceeding one cubic foot. The level A or B unit container for these packaging groups will suffice as the shipping container. For electron tubes with level C preservation, the shipping container shall conform to that specified for the level B unit container in the applicable packaging group. Closure shall be in accordance with the applicable container specification.

3.3.3.4 Packaging group 24. The unit container will serve as the shipping container. Closure shall be in accordance with the applicable container specification.

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. Electron tubes, packed as specified 3.3.1, shall be unitized on pallets in conformance with MIL-STD-147, load type I, with a wood cap (storage aid 5) positioned over each load.

3.3.4.2 Level B. Electron tubes, 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 Level C. Electron tubes, 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.

3.4 Marking. In addition to any other identification marking and special marking required by the contract (see 6.2), and except as specified herein, each unit pack, intermediate and exterior container, and unitized load shall be marked in accordance with MIL-STD-129.

3.4.1 Additional identification marking. The electron tube type number together with the manufacturer's part number (MFR/PN) and the Commercial and Government Entity (CAGE) code, shall be marked on interior and exterior containers as specified in MIL-STD-129. The alternate single label for small packs may be used at the option of the contractor for packaging group 1 tubes (see figure 1).

FROM:	NSN _____
	CAGE _____ MFR/PN _____
	ELECTRON TUBES
	(SPACE FOR QUANTITY AND UNIT OF ISSUE)
	(SPACE FOR CONTRACT NUMBER)
	(SPACE FOR PRES./PACKING LEVELS AND DATE PACKED)
	WT. _____ CU. _____
	TYPE NO. (IF APPLICABLE) _____
	(SPACE FOR SPECIAL MARKING)
	TO:

FIGURE 1. Alternate single label for small packs.

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3.4.2 Special marking.

3.4.2.1 Infrared tubes. Infrared tubes susceptible to damage by prolonged exposure to light shall include the following marking on the unit container: "DO NOT REMOVE FROM CONTAINER EXCEPT FOR USE OR TEST. AVOID PROLONGED EXPOSURE TO LIGHT."

3.4.2.2 Country of origin. When the country of origin does not appear on the tube due to inadequate allowable marking area, the phrase "MADE IN USA" or the abbreviation "U.S.A." shall be marked on each unit container. For electron tubes manufactured in other countries, the phrase shall be changed accordingly.

3.4.2.3 Miscellaneous special markings. Containers for which the upper corner drop tests are not required shall be marked with arrows as specified in MIL-STD-129 (see 4.6.2.1). When applicable, Method II, radioactive and magnetized material markings shall be applied in accordance with MIL-STD-129.

3.5 First article and quality conformance inspections. First article and quality conformance inspections and tests shall be required as specified in 4.4 and 4.5, respectively. Samples for these tests shall be furnished in accordance with the procedures outlined in 4.4 and 4.5. 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. The inspection required for industrial packaging shall be as specified (see 6.2).

3.5.1 Functional requirements.

3.5.1.1 Rough handling test. 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 electron tubes within the tested packs shall show no visible signs of damage. When specified (see 6.2), functional tests in accordance with the sampling and inspection criteria of MIL-E-1, table I (sampling and acceptance criteria for qualification) shall be conducted on those electron tubes subjected to the rough handling test to determine freedom from operational malfunction.

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.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order (see 6.2), the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of section 3. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 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

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accuracy of the measuring and test equipment shall be in accordance with MIL-STD-45662.

4.1.3 Inspection conditions. All inspections shall be performed in accordance with the test conditions specified in the general requirements of MIL-STD-202.

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

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

4.3 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.

4.4 First article inspection. Unless otherwise 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 (a) when there have been changes in materials, processes or packaging design that will not adversely affect item protection since the last recorded inspection; (b) when special, detailed packaging instructions are furnished by the acquiring activity; (c) where level C protection is specified or; (d) (subject to the approval of the administrative contracting officer) when a prior successful inspection was conducted on a like item and pack. In the event electron tubes are supplied to government activities from existing inventories, the applicable first article inspections may be integrated with the quality conformance inspection requirements.

4.4.1 Sample size. One sample unit consisting of a level A or level B pack, as applicable, shall be submitted for first article inspection. The sample for the rough handling test shall consist of a complete pack as prepared for shipment except that when the unit container conforms to PPP-B-636, the sample shall apply to the unit pack. The sample for the leakage test shall be five unit packs selected at random from the first article exterior pack (shipping container).

4.4.2 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.

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

4.4.4 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.

TABLE I. Visual and dimensional inspections.

Major defects	Requirement paragraph	Method paragraph
Packaging materials not conforming to referenced specification requirements - - - - -	Section 3	} 4.6.1
Uncleaned or improperly cleaned items - - - - -	3.2.1.1 and 3.2.1.2	
Punctured or improperly fabricated barrier bag-	3.2.1.4.1, 3.2.1.4.3, 3.2.1.4.4, and 3.2.1.4.5	
Incorrect preservation method - - - - -	3.2.1.4	
Wrong quantity per unit or intermediate pack -	3.2.1.4 and 3.2.1.5	
Nonuse or incorrect application of intermediate containers- - - - -	3.2.1.5	
Improper box closures - - - - -	3.3.1, 3.3.2, and 3.3.3	
Omitted, incorrect, or illegible marking- - -	3.4	

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TABLE II. Functional inspections.

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

4.5 Quality conformance inspection. This inspection shall consist of the methods of inspection specified in tables I and II, respectively.

4.5.1 Inspection lot. An inspection lot, as far as practicable, 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.

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

4.5.2.1 Sampling plan. Statistical sampling and inspection shall be in accordance with MIL-STD-105 for special inspection level S-4. The acceptable quality level (AQL) shall be 4.0 percent defective for all inspections of table I combined.

4.5.2.2 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. Such lots shall be separate from new lots and shall be clearly identified as reinspected lots.

4.5.2.3 Disposition of sample units. Sample units which have passed all the inspections specified in table II may be delivered on the contract or purchase order if the lot is accepted.

4.5.3 Functional inspection. Functional inspection shall consist of the test specified in table II.

4.5.3.1 Sampling plan. Sampling plans shall be as follows:

- a. One sample unit for the rough handling test shall be selected whenever the design of the item or packaging is changed.
- b. 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 or the number produced if less than five.
- c. The leakage test shall also be performed following the rough handling test on unit packs requiring waterproof or water-vaporproof barriers. Five sample units or the number of units contained within the shipping container, if less than five, shall be selected.

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

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

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4.5.3.4 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 I may be reinstated; however, final acceptance shall be withheld until the reinspection in accordance with table II shows 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.

4.6 Methods of inspection.

4.6.1 Visual and dimensional inspections. Unit, intermediate, and exterior packs shall be inspected to verify that the materials, designs, methods, physical limitations, marking, and workmanship are in accordance with the applicable requirements (see section 3 and table I).

4.6.2 Functional inspections.

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 MIL-P-116 and 3.5.1.1. The upper corner drops of the free fall drop test shall not be required for those tubes that cannot be inverted without internal damage.

4.6.2.2 Leakage. When a waterproof or water-vaporproof barrier is required, the unit pack shall be subjected to the applicable leakage test and interpretation of results specified in MIL-P-116 and 3.5.1.2.

5. PACKAGING

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

6. NOTES

6.1 Intended use. The preservation, packing, and marking specified herein are intended for direct shipments to the Government. However, this specification may also be used for the preparation of electron tubes and accessories for shipment from the parts contractor to the original equipment manufacturer.

6.2 Ordering data. 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. Methods of preservation, if other than that specified (see 3.2.1.4.3 and 3.2.1.4.4).
- d. If magnetic shielding is required (see 3.2.1.4.3).
- e. Quantity per unit pack, if other than specified (see 3.1.5.1, 3.2.1.4.6, and 3.2.3).
- f. 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).
- g. If other identification marking or special marking is required (see 3.4).
- h. If electron tube functional inspections are required (see 3.5.1.1).
- i. If the contractor is not responsible for the performance of all inspection requirements (see 4.1).
- j. If first article inspection is not required (see 4.4).

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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 acquiring activity or the activity administering the contract of the time and location of this inspection so that the Government representative will have an opportunity to witness the tests.

6.4 Conditions for use of level B preservation. When level B preservation is specified (see 3.2), this level of protection should be reserved for the acquisition of electron tubes and accessories for resupply worldwide under known favorable conditions.

6.5 Subject term (key word) listing.

Cathode ray tubes
 Electron tubes
 Magnetic shielding
 Magnetron tubes
 Marking
 Packaging
 Packaging groups
 Receiving tubes
 Special marking

6.6 International standardization agreement. Certain provisions of this specification are the subject of NAT-STD-4012. When an amendment, revision or cancellation of this specification is proposed which will modify the international agreement concerned, the preparing activity will take appropriate action through international standardization channels, including departmental standardization offices to change the agreement or make other appropriate accommodations.

6.7 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

Custodians:

Army - ER
 Navy - EC
 Air Force - 85
 DLA - ES

Preparing activity:

Navy - EC

Agent:

DLA- ES

Review activities:

Army - AR, CR, MI, SM
 Air Force - 80

(Project 5960-3363)

User activities:

Navy - AS, CG, MC, OS, SH

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NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

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