

Packaging Information for Vendors Hard Copies Uncontrolled. Verify Revision Prior to Use.	Engineer	Approved	
	K. Dinjian	D.A.Verfaillie	
Nomenclature General Vendor Packaging	Part or Drawing No. PIV-6012	Date 29-Aug-16	Revision 10
Instructions:			Sheet No. 1 of 7

This specification is provided to inform vendors of Raytheon Systems Company's minimum packaging requirements. This document is superseded by any special requirements listed on drawings or specifications.

Suppliers must be able to provide proof of compliance to use of military specification materials called out in this document upon request by Supplier Quality.

I. General Packaging Requirements:

- A. The packaging should allow for **safe delivery** of the shipment to its destination with no damage to the contents.
- B. Drop Shipments to the D.O.D. or Raytheon Customers shall be per MIL-STD-2073, Level A for both Foreign and Domestic Shipments.
- C. Follow **ASTM-D3951** (Standard Practice for Commercial Packaging) except for Drop Shipments to the Customer (Section I, B) or excluded items (Section I, D).
- D. Items excluded from ASTM-D3951:
 - 1. Ammunition, explosives and hazardous materials
 - 2. Tape and reel components
 - 3. Plastic Encapsulated Microcircuits (PEMs)
 - 4. All overseas shipments either to or from the Continental United States.
- E. This document provides supplemental details and clarification for items covered by ASTM-D3951.
- F. No packaging material is to be used that will leave any residue from the packaging material on the parts as a result of packaging or unpacking the product.
- G. **Foreign Object Debris (FOD)**
 - 1. **DO NOT USE LOOSE FILL MATERIAL IN ANY FORM.** Loose fill material will be considered as any small piece of packaging material that can be poured into a container to fill void container space. Some examples of loose fill are packing peanuts, shredded paper or plastic, folded paperboard pieces and broken expanded polystyrene (Styrofoam) pieces. **See ASTM D3951, Section 5.1.1.4.**
 - 2. There shall be no evidence of FOD in received containers.
- H. Staples are not to be used for the closure of packs due to several negative impacts:
 - 1. When staples are removed they can become FOD
 - 2. Staples do not provide for a proper seal of barrier bags
 - 3. The removal process of staples can lead to potential personal injuries (eye and hand)
- I. Mitigate part movement
 - 1. Helps to prevent part damage due to vibration such as scratches
 - 2. Remove excess air from bags with multiple parts. Roll excess bag material around the bagged items and secure.
 - 3. Fill void spaces with cushioning material or blocking (when necessary to mitigate part movement)
- J. "Pink Poly" in any form, used as cushioning, wraps, bags or dunnage/filler must comply with MIL-STD-3010, Method 3005. **"Pink Poly" does not provide ESD shielding properties and may not be used to replace conductive materials as the ESD protective shielding medium for static sensitive devices.** Acceptable "Pink Poly" material shall comply with military specifications (i.e. A-A-3129, Style B, Type I, Class B, Grade 2 or PPP-C-795, Class 2).
WARNING: The supplier must be able to supply proof of compliance to MIL-STD-3010, Method 3005.

II.

Packaging of Items Excluded from ASTM-D3951

A. Ammunition, Explosives and Hazardous Materials

- 1. Shall be packaged in accordance with **Title 49 of the United States Code of Federal Regulations (49 CFR).**
- 2. The vendor will assure that packaging containing or intended to contain designated hazardous materials will be properly tested (Performance Oriented Packaging) and certified as complying with the performance standards of the United Nations and the United States Department of Transportation:
 - a) International Civil Aviation Organization
 - b) International Air Transport Association (Section 10)
 - c) International Maritime Organization (Volume 1, Annex 1, Section 8)

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II. Packaging of Items Excluded from ASTM-D3951 (Continued)

B. Tape and Reel Components

1. The requirement for tape and reeling of components will be determined by the appearance of Quality Note MR (QNMR) on the purchase requisition.
2. QNMR instructions will provide tape and reel specifications. However, the tape and reeled lot is to be packaged (over-packed) for shipment in accordance with ASTM-D3951.

C. Plastic Encapsulated Microcircuits (PEMs)

1. Packaging, handling and marking of the PEMs shall be in accordance with:
JOINT INDUSTRY STANDARD, IPC/JEDEC J-STD-033
2. Major categories (but not limited to) J-bend and gull-wing leaded packages such as:
 - a) Plastic Leaded Chip Carriers (PLCC's)
 - b) Small Outline Integrated Circuits (SOIC's)
 - c) Plastic Quad Flat Packs (PQFP's)
 - d) Thin Small Outline Packages (TSOP's)
3. Mark all PEMs packages: "**DO NOT DE TRASH**"
4. Cover each populated JEDEC tray with an empty JEDEC tray as a cover, allowing each populated JEDEC tray the ability to be separated and shipped individually with its own cover if necessary.
5. Secure trays using non-stretching bands, straps or JEDEC tray clips.

Example Material: Correct Products, Inc., Part Number: VSI-24ESD

Web Address: <http://www.correctproducts.com>

Phone: 800-870-1199

D. DIE CARRIERS

1. The word "shall" invokes a binding requirement for the supplier to meet.
- 2.1 The supplier shall ensure all die are packaged in 2 inch by 2 inch conductive Fluoroware trays and lids, part number H2O series or equivalent and packaged to meet the following requirements.
- 2.2 All die shall be oriented in the same direction with the bond pads facing upward and there shall be only one die per cavity.
- 2.3 The package shall be chosen to allow for not more than 15 degrees of rotational movement and the internal grid shall be of a size to allow adequate removal via vacuum pick-up tool.
- 2.4 The package lid, when in place, shall prevent intermingling of the die. The die carriers shall be packaged in conductive field-shielding barrier bags per MIL-PRF-81705, type I, class 1.

III. Supplemental Packaging Details for Special Items Following ASTM-D3951

A. Static Sensitive Devices

1. Package in compliance with ASTM-D3951 and use only packaging materials that will protect the part from electrostatic damage and corrosion during long-term storage and in-plant handling.
2. "Pink Poly" in any form, used as cushioning, wraps, bags or dunnage/filler must comply with MIL-STD-3010, Method 3005. **"Pink Poly" does not provide ESD shielding properties and may not be used to replace conductive materials as the ESD protective shielding medium for static sensitive devices.** Acceptable "Pink Poly" material shall comply with military specifications (i.e. A-A-3129, Style B, Type I, Class B, Grade 2 or PPP-C-795, Class 2).
WARNING: The supplier must be able to supply proof of compliance to MIL-STD-3010, Method 3005.
3. Assure shielding bags conform to MIL-DTL-117, Class F and are made from MIL-PRF-81705, Type I barrier material.
4. Evacuate excess air (by vacuum or hand) and heat seal.
5. Desiccate items for drop-ship or over-seas shipments per MIL-STD-2073, Section 5.2.3.7
6. Affix static electricity labels as shown below or equivalent types to the unit package and exterior container when applicable.



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<p>III. Supplemental Packaging Details for Special Items Following ASTM-D3951 (Continued)</p> <p>B. Metals (Requirements are for Non-ESD Sensitive items only. For Static Sensitive Devices, see section III-A.)</p> <p>1. Cadmium items (Parts with cadmium and Assemblies containing parts with cadmium)</p> <p>a) Exempt from cadmium requirements: Cadmium covered by metal overlay/plating</p> <p>b) NOT exempt from cadmium requirements: Any/all cadmium NOT covered by metal overlay/plating</p> <p>c) Place in WATER VAPOR PROOF bags conforming to MIL-DTL-117, Class E or F</p> <p>d) Remove excess air and heat seal.</p> <p>2. Silver plated and copper plated items</p> <p>a) Place in WATER VAPOR PROOF bags conforming to MIL-DTL-117, Class F for ESD Sensitive items or MIL-DTL-117, Class E or F for Non-ESD Sensitive items</p> <p>b) Remove excess air and heat seal.</p> <p>3. Painted or plated items</p> <p>a) Includes: Cadmium covered by metal overlay/plating</p> <p>b) Does NOT include:</p> <p>(1) Any/all cadmium NOT covered by metal overlay/plating</p> <p>(2) Silver plated items</p> <p>(3) Copper plated items</p> <p>c) Place in WATERPROOF bags conforming to MIL-DTL-117, Class B, C, E, F or H</p> <p>d) Remove excess air.</p> <p>e) Heat seal or seal with tape (ASTM D5486, Type III or IV). Must ensure waterproof seal.</p> <p>4. All other non-plated and/or unpainted items</p> <p>a) Option 1</p> <p>(1) Place in Static Intercept LDPE zip-lock bags.</p> <p style="text-align: right;">Reference Supplier: Liberty Packaging Co., Address: 22 Raleigh Road, Braintree, MA Phone: 781-849-3365</p> <p>(2) Remove excess air and seal.</p> <p>b) Option 2</p> <p>(1) Place in WATER VAPOR PROOF bags conforming to MIL-DTL-117, Class E or F</p> <p>(2) Remove excess air and heat seal.</p> <p>C. Optics and Polycarbonates</p> <p>1. Packaging material requirements</p> <p>a) Chemically neutral (E.G. amine free)</p> <p>b) Non-dusting</p> <p>c) Free of foreign contaminants</p> <p>2. Intimate cover (to prevent scratching)</p> <p>a) Lens safe tissue</p> <p>b) Lens safe cloth</p> <p>3. Additional protection over intimate cover</p> <p>a) Must prevent objects from exerting direct surface pressure</p> <p>b) Static Sensitive Devices</p> <p>(1) Material must be static dissipative or conductive</p> <p>(2) Material must comply with MIL-STD-3010, Method 3005 and EIA 564 testing</p>			
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III. Supplemental Packaging Details for Special Items Following ASTM-D3951 (Continued)

D. Cables and Cable Connectors

1. The packaging method must protect the connectors from physical damage and Foreign Object Debris (FOD).
2. Connectors on cables must be capped, bagged, covered with cushioning or wrapped.
 - a) Preferred method for protection of connectors on cables are appropriate sized conductive protective caps. Non-conductive caps may be used if the part is not ESD Sensitive.
 - b) Small cables with light connectors may use individual cable bagging to protect the connectors.
 - (1) The connectors may not directly touch each other.
 - (2) For coiled cables, coil in a manner that does not allow the connectors to touch.
 - c) Large, heavy connectors must either be individually capped with appropriate sized protective caps or individually protected with bags, wraps and/or cushions.
3. Packaging materials for cables
 - a) **Bags**
 - (1) All connector and cable bags shall be waterproof or water vapor proof.
 - (2) For bag closure, excess air shall be removed and the bag shall be heat sealed or sealed in a manner that assures a waterproof seal.
 - (3) Bags covering individual connectors on cables shall be taped per the taping instructions below.
 - b) **Cushioned Wraps**
 - (1) Cushioned wraps covering individual connectors on cables shall be taped per the taping instructions below.
 - c) **Tapes** - for securing cushioning and bags
 - (1) Allow no tape to contact the connector body
 - (2) Tapes allowed for securing that may contact the cable jacket/sleeving:
Non-Residual Tape: SAE-AMS-T-22085, Type II
 - (3) All other tapes may not contact the cable jacket/sleeving.

E. Items with Preservative Coatings, Open Ports or Containing Liquids

1. Preservative Coatings
 - a) To limit the amount of required cleaning, preservative coatings should only be used when necessary.
 - b) When preservatives are required, ease of cleaning should be taken into consideration when selecting preservatives.
 - c) Items coated with oil or grease based preservatives should be wrapped or bagged in a manner that prevents leaking using one of the following materials or equivalent:
 - (1) Water vapor proof, greaseproof bag: MIL-DTL-117, Class E
 - (2) Waterproof, greaseproof bag: MIL-DTL-117, Class C
 - (3) Water vapor proof, greaseproof barrier: MIL-PRF-131
 - (4) Waterproof, greaseproof barrier: MIL-PRF-121
2. All Open Ports should be capped, plugged or suitably covered to prevent leakage or contamination.
3. Items Containing Liquids
 - a) Package in a manner to prevent leakage inside the unit container
 - b) Mark the exterior unit container with orientation labels when the package orientation affects leakage

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IV. Shipping Containers, Pallets and Lumber

- A. Pack containers to assure carrier acceptance, safe delivery and adequate storage at receiving location.
- B. Assure containers are in accordance with carrier rules and regulations, applicable to the mode of transportation.
- C. Use a minimum size container to provide a snug fit for the item.
- D. All wood boxes, wood skids, wood filler assemblies, wood dunnage assemblies, and wood pallets must be compliant to **International Standards For Phytosanitary Measures No. 15 (ISPM-15)**.
- E. Wood packaging material shall be assembled using materials certified compliant with the American Lumber Standards Committee (ALSC) Non-Manufactured Wood Packing (NMWP) regulations and International Plant Protection Convention (IPPC) standard requirements.
- F. The shipping container shall be capable of multiple handling and storage periods at a minimum of one year in enclosed facilities without damage to the product.
- G. **Usable container specifications**
 - 1. Commercial equivalents must meet performance specifications of ASTM D3951, Section 2.
 - 2. Fiberboard Containers
 - a) Raytheon insists on strict compliance with Uniform Freight Classification, Rule 41 from the railway industry for the minimum requirements of fiberboard containers regarding weight and size limitations.
 - b) Staples are not to be used for closure.
 - c) Fiberboard Shipping Boxes: ASTM D5118
 - c) Triple-Wall Corrugated Fiberboard Containers: ASTM D5168
 - 3. Crates
 - a) Crate specifications
 - (1) Wood-Cleated Panelboard Shipping Boxes: ASTM D6251
(Preferred design is ASTM D6251, Type III, Class 2, Style A or B)
 - (2) Wood Boxes: ASTM D6880
 - (3) Wood-Cleated with Skidded, Load-Bearing Bases: ASTM D6256
 - (4) Wirebound Pallet Type Wood Boxes: ASTM D6254
 - (5) Steel or Aluminum Slotted Angle Crates: ASTM D6255
 - (6) Open and Covered Wood Crates: ASTM D6039
 - (7) Heavy Duty Sheathed Wood Crates: ASTM D7478
 - (8) Open Wood Crates; 12,000 and 16,000 Pound Capacity: MIL-C-3774
 - b) Weight and size limitations: See ASTM D3951, Table I or container specification.
 - c) Crates with gross weight over 250 pounds
 - (1) Provided with skids made from 4" x 4" nominal lumber or larger
 - (2) If the crate specification requires a skid size larger than 4" x 4" nominal lumber, the larger skid size shall be used.
 - d) Closure for shipments within the Continental United States (CONUS) to Raytheon facilities
 - (1) Use closure methods that allow for ease of uncrating
 - (2) Closure method should not inhibit the integrity of the crate construction
 - (3) Suitable method examples:
 - Phillips wood screws (appropriate size, not drywall screws)
 - Klimp fasteners per Military Specification MS24535
 - ASTM D6251, Figure 3: Unnailed Top Panel Closure secured with strapping

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V. Marking

- A. Markings shall be sufficient to clearly and visibly identify the contents of the package.
- B. Markings shall be in accordance with carrier rules and regulations.
- C. Hazardous or restricted items must be properly marked **in accordance with Title 49 of the United States Code of Federal Regulations (49 CFR).**

- 1. Exterior shipping packages (shipping cartons) shall be marked with U.N. certification markings indicating the level of performance achieved through testing.
- 2. For interior packaging such as cans and bottles, a certificate of compliance or actual test reports indicating the level of performance achieved through testing must be provided.
Reference Title 49 of the United States Code of Federal Regulations (49 CFR).

D. Minimum Container Markings

- 1. Minimum container markings apply to the unit container, the intermediate container (when unit containers are overpacked into an intermediate container) and the exterior shipping container.
- 2. Minimum container markings shall be **IN ADDITION TO** other required markings such as hazardous material markings.
- 3. Shipments within the Continental United States (CONUS) to Raytheon facilities shall be in accordance with **ASTM D3951, Section 5.1.6 except for Classified Items. The nomenclature shall not appear on the exterior container for Classified Items.**
- 4. All drop shipments to the Department of Defense shall be in accordance with **MIL-STD-129.**
- 5. Include precautionary markings, if applicable
 - a) Static Sensitive: Affix static electricity labels as shown below or equivalent types to the unit package and exterior container when applicable.



- b) Magnetic
- c) Fragile

E. Temperature Sensitive Materials (when required)

- 1. Only required when the item is susceptible to damage from temperature extremes due to the shipping or storage environment or when specified in the contract, purchase order or drawing.
- 2. Affix storage temperature warning labels
- 3. Locations of storage temperature warning labels
 - a) On the package closest to the product
 - b) On the outside shipping container

F. Lot, batch or identification control numbers (when required)

- 1. Only required when specified in the contract or purchase order.
- 2. Place on unit packs, intermediate containers and exterior containers.
- 3. Precede with the proper designation. (Example: LOT A03, Serial Number 15790)
- 4. Show adjacent to the contract number.

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V. Marking (Continued)

G. Shelf Life Marking (when required)

1. Only required when specified in the contract, purchase order, drawing or Q-Note other than PIV.
2. Apply shelf life markings as part of the item identification data to unit packs, intermediate containers, exterior containers and unpacked items.
3. Mixing different shelf life dates in the same unit container is not allowed.
4. When two or more unit packs of the same item are consolidated within any intermediate or exterior containers and have different shelf-life dates, the earliest dates shall be shown on those containers.
5. For items that contain rubber or synthetic elastomers, calculate dates from the cured date

6. Examples

- a) **EXAMPLE 1 (TYPE I) - Non-Extendable Shelf Life Items, (Month/Year)**
MFD DATE 4/12
EXP DATE 4/16
- b) **EXAMPLE 2 (TYPE II) - Extendable Shelf Life Items, (Month/Year)**
ASSEMBLED DATE 10/13
INSP/TEST DATE 10/16
- c) **EXAMPLE 3 (TYPE II) - Identify cured items by calendar quarter, (Quarter/Year)**
CURED DATE 4Q13
INSP/TEST DATE 4Q16

VI. Quality Assurance

- A. Failure to comply with the requirements specified herein may result in rejection and return of consignment(s) to the supplier at their expense.
- B. For questions related to the application of this Packaging Information, please contact the Raytheon Buyer.
- C. Any exceptions to this document must be authorized by the Supplier Quality Representative.

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