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## DELICATE PART CUSHIONED WITHIN CONTAINER (CUSHIONING DETAILED)

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### 1.0 SCOPE

This standard provides for the individual packaging of delicate/fragile parts or components in a container with flexible cushioning and protection of such items subject to damage from field forces, e.g., electrostatic, electromagnetic, magnetic and radioactive.

### 2.0 REFERENCES

- 2.1 Lockheed General Packaging Standard LPS 40-001 (General Requirements Specification)
- 2.2 Lockheed Packaging Standard P-201, "Thermal Control" Labels
- 2.3 LMSSC 2.4.2-T1-SpecEng-6.1-S, "ESD Control Standard"

### 3.0 REQUIREMENTS

#### 3.1 GENERAL

- 3.1.1 The quantity per unit package shall be one each.
- 3.1.2 Any loose item(s) required per part shall be enclosed in a separate plastic bag and secured within the unit package so as to prevent damage to other items.
- 3.1.3 Components consisting of two or more separate matched parts (sets) shall be packaged within the same unit package providing that appropriate protection is provided, or they may be individually packaged then overpacked within one unit container.
- 3.1.4 Exposed silver or silver-plated parts shall be protected with tarnish-inhibitor material. Minimum surface area of the tarnish inhibitor shall be twice the area of the silver surface of the item.

**NOTE:** The treated side of the inhibitor material must be facing the item.

**CAUTION:** ITEMS HAVING ANY SURFACE INCOMPATIBLE WITH THE TARNISH INHIBITOR SHALL BE COMPLETELY WRAPPED WITH A NEUTRAL MATERIAL PRIOR TO APPLICATION.

- 3.1.5 Assemblies, parts and components identified in the procurement document (2) specification, or drawing as being susceptible to damage by field forces, shall be packaged in accordance with Paragraphs 3.2.2, 3.2.3, or 3.2.4, as applicable.
- 3.1.6 Protect all exposed or projecting pins, contacts, fittings, etc., with proper size type and style of protective caps (conductive when required), plugs, closures (see Paragraph 5.1.2).

**CAUTION:** USE ONLY STATIC PROTECTIVE CAPS OR COVERS ON STATIC SENSITIVE ASSEMBLIES.

- 3.1.7 Cushioning material, thickness and container type and style shall be in accordance with Table 1, Table 2, and Table 3. Cushioning design shall conform to Figure 2.
- 3.1.8 When specified in the detail item drawing or specification, special cleaning requirements, protective wraps, bags, etc., shall be accomplished in lieu of the normal requirements specified in Paragraph 3.2.1.

**CAUTION:** USE ONLY STATIC PROTECTIVE CAPS OR COVERS ON STATIC SENSITIVE ASSEMBLIES.

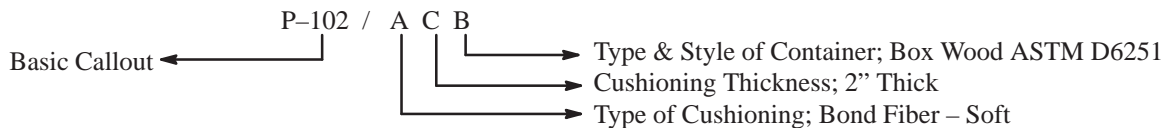
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- 3.1.9 The type of cushioning, thickness of cushioning and container requirements shall be designated by the suffix letters following the basic callout (P-102), e.g., Table 1 identifies nine types of material (LPS Suffix A through I); Table 2 identifies eight possible cushion thickness (LPS Suffix A through C, plus X when no specific thickness is designated). Table 3 identifies nine possible container types and styles (LPS suffix A through I)



### 3.2 UNIT PACKAGING

- 3.2.1 Unless otherwise specified, nonstatic sensitive item(s) shall be wrapped with a neutral material or placed in a plastic bag, include tarnish inhibitor and provide protective caps as applicable (Ref Paragraphs 3.1.4 and 3.1.6). If a bag is used, allow sufficient material to permit at least one additional resealing.
- 3.2.2 Static Sensitive Items – Use only static protective plastic material (MIL-B-81705) to wrap or bag each item.
- 3.2.3 Electromagnetic Sensitive Item(s) – Wrap each item in a neutral material and enclose in a bag, close by heat seal allowing sufficient material for two additional heat seals. Suppliers shall preserve and pack ESD hardware in accordance with requirements established in the Purchase Order, Statement of Work (SOW), Product Specification or Engineering Drawing. LMSSC facilities shall preserve and pack ESD hardware in accordance with 2.4.2-T1-SpecEng-6.1-S, ESD Control Standard and applicable Engineering Drawing Notes. Should there be a conflict between the requirements of this packaging standard and contractual requirements, the Contract shall take precedence.
- 3.2.4 Magnetic Sensitive Item(s) – Wrap each item in ferrous/ferritic composition of sufficient thickness to provide the degree of protection required. Since damaging influence of magnetic fields vary with the degree of susceptibility, shielding effectiveness should be verified prior to shipment.
- 3.2.5 Provide type of cushioning, thickness and design in accordance with Paragraph 3.1.7. Cutouts of the cushioning for multiple items (Figure 2) shall be adequately spaced to prevent the items from contacting each other during storage/shipment. Other cushioning applications may be selected, providing that equivalent shock/vibration protection of the cushioning design has been established and validated by tests, cushioning curves (MIL-HDBK-304), satisfactory shipments, etc. Place item(s) in a snug fitting container. Container size shall be commensurate with size and configuration of item(s) and the amount of cushioning specified.

### 3.3 INTERMEDIATE PACKAGING

- 3.3.1 Pack any number of fiberboard unit packages uniformly in fiberboard or wood containers.
- 3.3.2 Fill all voids with suitable dunnage, blocking or bracing to prevent damage during handling/shipment.

### 3.4 PACKING

- 3.4.1 Pack any number of intermediate fiberboard containers uniformly into each shipping container.
- 3.4.2 Shipping containers as packed, shall protect each item and package during ordinary handling and shipping and shall meet the minimum requirements of the common carriers for acceptance for safe transportation at the lowest rate to the point of delivery.
- 3.4.3 Intermediate containers which meet the requirements of Paragraph 3.4.2 may be used as shipping containers.
- 3.4.4 Enclose or attach a copy of packing slip to the shipping container.

3.5 **MARKING** (Unless otherwise specified in the contract or P.O. use the following criteria)

3.5.1 Unit Package Marking – Label or mark each package to show at least the part number per contracting document and supplier identity. Apply Thermal Control Labels (P-201), when applicable. Packages containing a tarnish inhibitor shall be marked/labeled: “Protected with Tarnish Inhibitor – Do Not Open Until Ready for Use or Inspection.” Apply additional markings as specified in the item detail specification/drawing.

3.5.1.1 Electrostatic CAUTION Label – Apply WARNING label to each unit package containing a static sensitive device.



Figure 1. Electrostatic CAUTION Label

**CAUTION:** LABELS MUST ADHERE PERMANENTLY TO ALL PACKAGE MATERIALS. SUPPLIERS SHOULD ONLY USE LABELS WITH PROPER ADHESIVE QUALITIES COMPATIBLE WITH THE STATIC PROTECTIVE PLASTIC PACKAGES. IF ABOVE LABELS ARE NOT AVAILABLE, OTHER STYLES, COLOR AND MARKING MAY BE SUBSTITUTED, PROVIDING THAT EQUIVALENT STATIC PROTECTIVE PRECAUTIONARY WORDING IS USED AND THE ADHESIVE QUALITY IS ACCEPTABLE.

3.5.1.2 Apply warning label(s) (electromagnetic, magnetic, radioactive, etc.) to each unit package when applicable.

3.5.2 Intermediate Packaging Marking – Label or mark each intermediate package per Paragraphs 3.5.1 through 3.5.1.2 ; include the quantity within each intermediate package.

3.5.3 Shipping Container Marking – Label or mark each container to show part number per contracting document, the LMSSC contracting document number, supplier, destination and quantity of parts.

3.5.3.1 Delicate handling markings and electrostatic WARNING label(s), shall be applied as required.

3.5.3.2 Apply magnetic/radioactive WARNING labels, as applicable, when required by the Department of Transportation Regulations.

**4.0 QUALITY ASSURANCE**

4.1 Packaging shall be accomplished in such a manner as to prevent physical damage to, or degradation of, the packaged items during delivery to the using activity. It shall be the prerogative of LMSSC to return damaged items, at supplier's expense, when such damage is attributable to improper or inadequate protection.

**5.0 NOTES**

5.1 The following information is intended as a guide or aid to suppliers in meeting the requirements of this specification.

5.1.1 Definition – Unprotected Silver Surfaces. All metallic silver surfaces (having stringent reflectivity or conductivity requirements, close tolerance finishes and/or dimensions, without supplementary tarnish-resistant treatment), the deterioration of which may result in premature failure or malfunction of the item or equipment having such surfaces.

5.1.2 References

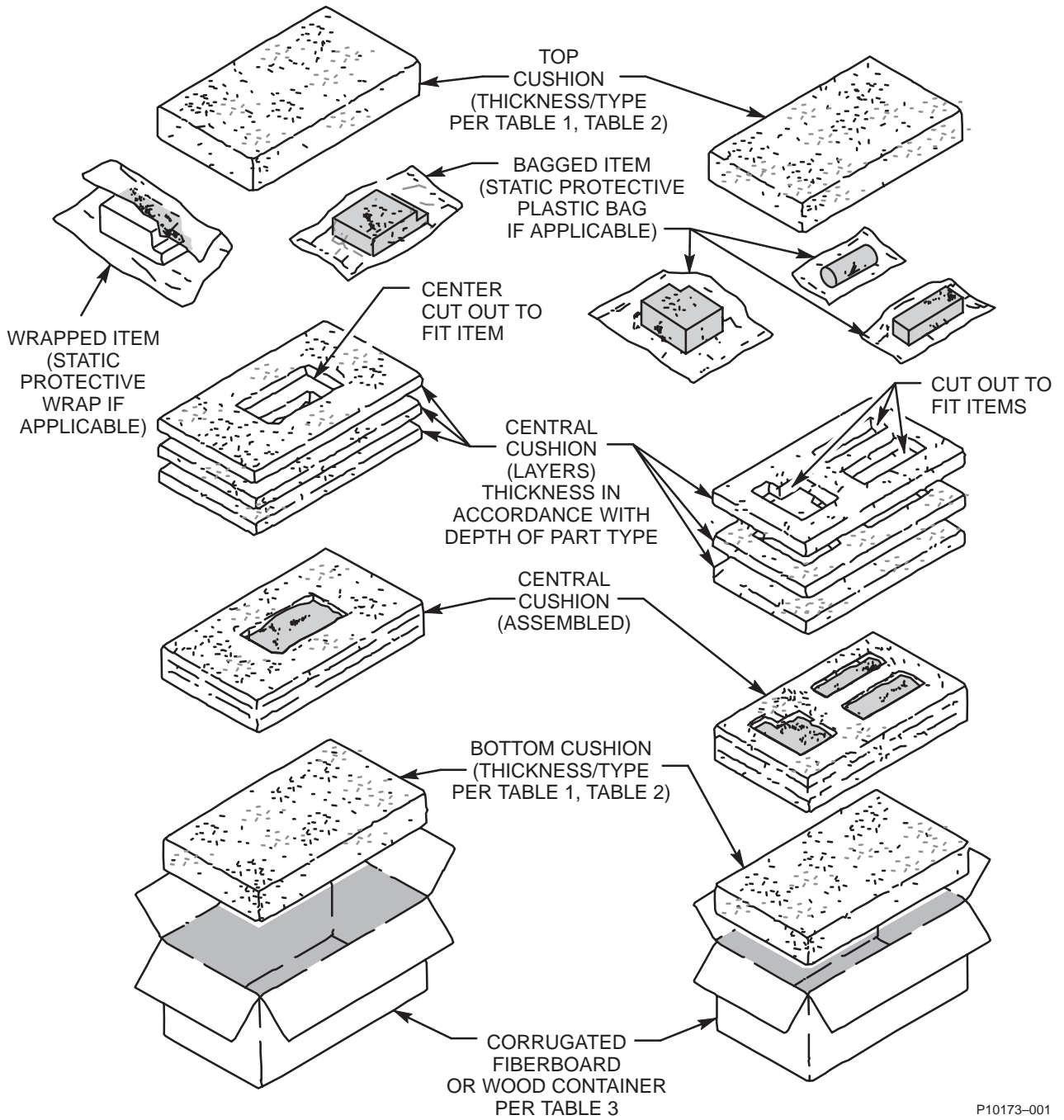
<u>Commodity</u>	<u>Military/Commercial Specifications/Source</u>
Barrier Material, Electromagnetic	MIL-PRF-81705, Type 1, Class 1
Cushioning Material	PPP-C-1120
Cushioning, Polyurethane, Flexible	MIL-PRF-26514, Type I, Class 2, Grade B
Label, Static WARNING	Commercially Available
Plastic, Sheet/Strip	A-A-3174, Type I, Class 1, Grade B
Package Cushion Design	MIL-HDBK-304
Paper, Wrapping, Neutral	MIL-P-17667, Type 2, Class 1
Protective Caps	AS090376 or NAS 831; NAS 813, 820
Silver Tarnish Inhibitor	Commercially Available (Must be approved by LMSSC PMP)
Box, Corrugated (Tri-Wall)	ASTM D5168 (Nonweather Resistant)
Box, Fiberboard	ASTM D5118, Type CF, Class Domestic, SW, Style RSC, Grade 44 ECT or 200 Mullen
Box, Wood	ASTM D6880
Box, Wood Cleated, Plywood	ASTM D6251
Box, Wood Cleated, Veneer	PPP-B-576 (Domestic Class)
Fiber Box, Closing	ASTM D1974

**6.0 SPECIAL PRECAUTIONARY MEASURES**

Electrostatic sensitive devices/assemblies are susceptible to damage by electrostatic discharge (ESD). Users should observe the following precautions when handling these types of devices or assemblies.

6.1 DO NOT handle/transport unless the items are in static protective or conductive packages/trays, etc.

6.2 Remove items from static protective packaging only at a certified grounded workstation. All equipment, tools, materials and personnel shall be static protective.



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Figure 2.

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<b>Table 1</b>		
<b>CUSHIONING</b>		
<b>LPS Suffix</b>	<b>Type of Material</b>	<b>Material Specification</b>
A	Bound Fiber – Types I, Class B, Soft	PPP-C-1120
B	Bound Fiber – Type II, Class B, Medium Soft	PPP-C-1120
C	Bound Fiber – Type III, Class B, Medium Firm	PPP-C-1120
D	Bound Fiber – Type IV, Class B, Firm	PPP-C-1120
E	Polyurethane Foam – Flexible, Type I, Class 2, 1.2 – 1.5 Density	MIL-PRF-26514
F	Polyurethane Foam – Flexible, Type I, Class 2, 1.6 – 1.9 Density	MIL-PRF-26514
G	Polyurethane Foam – Flexible, Type I, Class 2, 2.5 – 3.0 Density	MIL-PRF-26514
H	Polyurethane Foam – Flexible, Type I, Class 2, 2.5 – 4.0 Density	MIL-PRF-26514
I	Polyurethane Foam – Flexible, Type I, Class 2, 3.1 – 4.0 Density	MIL-PRF-26514

<b>Table 2</b>	
<b>CUSHIONING THICKNESS</b>	
<b>LPS Suffix</b>	<b>Cushioning Thickness Required on All Sides of the Items</b>
A	1/2 inch
B	1 inch
C	2 inch
D	3 inch
E	4 inch
F	5 inch
G	6 inch
X	As Required

<b>Table 3</b>		
<b>CONTAINERS</b>		
<b>LPS Suffix</b>	<b>Type/Style</b>	<b>Specification</b>
A	Box, Wood/Corrugated – Any Style, Providing that the provisions of this specification are met	Suppliers Option (Ref Para 5.1.2)
B	Box, Corrugated, Domestic – Any Style, Single Wall (SW)	ASTM D5118
C	Box, Corrugated, Domestic – Any Style, Double Wall (DW)	ASTM D5118
D	Box, Corrugated, Weather Resistant – Any Style, Single Wall (SW)	ASTM D5118
E	Box, Corrugated, Weather Resistant – Any Style, Double Wall (DW)	ASTM D5118
F	Box, Corrugated, Triple Wall – Any Style, (Nonweather Resistant)	ASTM D5168
G	Box, Wood, Nailed, Domestic – Any Style	ASTM D6880
H	Box, Wood, Cleated, Domestic – Any Style	ASTM D6251
I	Box, Wood, Cleated, Veneer, Domestic – Any Style	PPP-B-576

