P-111Revision 4
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10-23-97

PACKAGING OF EXPLOSIVES FOR STORAGE AT THE SANTA CRUZ FACILITY

1.0 SCOPE

This standard provides for the packaging of electro–explosive devices, explosive parts, components and pyrotechnics for storage at the Santa Cruz Facility.

CAUTION: NO SHIPMENT IS AUTHORIZED USING THIS STANDARD. THIS STANDARD IS FOR USE ONLY AT THE SANTA CRUZ FACILITY, AND FOR STORAGE ONLY AT THE SANTA CRUZ FACILITY.

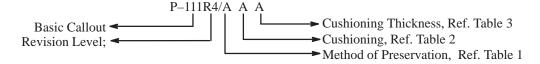
2.0 REFERENCES

- 2.1 Lockheed Packaging Standard LPS 40–001
- 2.2 NAS Packaging Standard 3425

3.0 REQUIREMENTS

3.1 GENERAL

- 3.1.1 Unless otherwise specified the quantity per unit package shall be one (1) each.
- 3.1.2 Items shall be clean and free of foreign matter.
- 3.1.3 Items subject to detonation by buildup of static electricity shall be individually wrapped in noncorrosive self–extinguishing, antistatic material (see Para 5.2). The material shall have a maximum surface resistivity of 1 x 1012 ohms when tested per ASTM D257–66 or meet the requirements of MIL–B–81705.
- 3.1.4 The use of <u>nonconductive polyethylene</u> material as an intimate wrap or package for explosives susceptible to detonation by static electricity is <u>prohibited</u>.
- 3.1.5 Any loose item(s) required per part shall be enclosed in a separate package, envelope, etc., and secured within the unit package.
- 3.1.6 Items having sharp protrusions, projections, fittings, etc., shall be adequately padded/cushioned to prevent damage to the package or item during handling/shipping.
- 3.1.7 Unless otherwise specified, detail preservation/packaging requirements shall be in accordance with Table 1, Table 2 and Table 3, as annotated on the procurement document. The basic callout (P–111R4) prescribes the packaging for explosives. The suffix letters following the basic callout, e.g., P–111R4/AAA identifies specific methods of preservation/cushioning (see tables).



3.2 <u>UNIT PACKAGING</u> (Ref MIL–P–116)

- 3.2.1 Each item shall be individually preserved/packaged in accordance with the designated LPS callout (see applicable tables).
- 3.2.2 Items normally procured by section, length, feet or reel shall be packaged in the quantity units specified by the item drawing/specification.
- 3.2.3 <u>Coilable Cut Lengths</u> Form item to a minimum safe diameter which will not degrade/damage the functioning or the performance of the explosive. Stiffener(s) made from corrugated fiberboard may be used to support coiled item(s) (see Figure 3).
- 3.2.4 <u>Reeled Explosive Charge</u> Coil item on a reel using a core of sufficient diameter to prevent permanent kinking or distortion of the charge (see Figure 6).

3.3 <u>INTERMEDIATE PACKAGING</u> (Consolidation of Unit Packages)

- 3.3.1 The quantity of unit packages per intermediate container shall not exceed the maximum dimension/weight provisions of the container specification. When packing more than one lot, each lot shall be in a separate intermediate container.
- 3.3.2 Fill all voids with suitable dunnage, blocking or bracing to prevent damage during handling/storage.

3.4 PACKING

- 3.4.1 Pack any number of intermediate containers uniformly into each storage container.
- 3.4.2 Storage containers as packed, shall protect each item during ordinary handling and storage.

3.5 MARKING

- 3.5.1 <u>Unit Package Marking</u> Label or mark each package to show:
 - a. Part number per contracting document
 - b. Supplier identity
 - c. Proper DOT shipping name/class of explosive
 - d. Net weight of explosive in package
 - e. Manufacturing or loading date
 - f. Lot number
 - g. Manufacturing serial number (when applicable)
 - h. Limited calendar life (when applicable)
 - i. Apply humidity control labels (when applicable)
 - j. Special Marks: "WARNING (red letters) contents subject to ignition/detonation by electrostatic discharge. Ground inner conductive wrap before and during removal from this package."
- 3.5.2 <u>Intermediate Packaging Marking</u> Label or mark each container same as Paragraph 3.5.1.
- 3.5.3 <u>Storage Container Marking</u> Label or mark each container to show part number, the LMMS contracting document number, supplier, and quantity of parts. Apply appropriate explosive labels, as required.
- 3.5.4 Special precautionary and handling markings shall be applied as required.

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 handling & storage.

5.0 NOTES

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

5.2 MATERIAL SPECIFICATIONS

Commodity	Military/Commercial Specifications
Barrier, Water Vaporproof	MIL-B-131, Class 1
Box, Fiberboard	PPP-B-636
Box, Wood Cleated	PPP-B-601
Box, Wood Nailed	PPP-B-621
Can, Fiber, Spiral Wound	MIL-C-3955
Can, Metal	PPP-C-96
Desiccant, Bagged	MIL-D-3464
Drum, Metal	MIL-D-6054
Drum, Reusable	MIL-D-6055
Fiberboard, Corrugated	PPP-F-320
Indicator, Humidity	MS20003
Paper, Waterproof/Greaseproof	MIL-B-121
Plastic Sheets, Electrostatic Free	MIL-B-81705
Velostat (conductive film)	#1701, Custom Materials, Chelmsford, MA

6.0 NOTES - EXPLOSIVES SENSITIVE TO STATIC ELECTRICITY

Ammonium Picrate Dust Mercury Fulminate
Black Powder Dust Potassium Chlorate

Diazo – Dinitrophenol Tetrazene
Grade B Magnesium Powder Tetryl
Igniter Compositions Tetrytol

Lead Azide Zirconium Powder

Lead Styphnate

	Table 1			
METHODS OF PRESERVATION				
LPS Suffix	Type of Preservation	Method (Ref MIL-P-116)		
A	No specific preservation required. Package for mechanical/physical protection.	III		
В	Waterproof barrier (any applicable ID method)	IC		
С	Water-vaporproof barrier without desiccant (any applicable IA method)	IA		
D	Water-vaporproof barrier with desiccant (floating bag) Figure 1	IIa		
Е	Water-vaporproof barrier with desiccant (container, barrier, container) Figure 2	IIb		
F	Water-vaporproof barrier with desiccant (cushioned item, bag) Figure 3, Figure 4	IIc		
G	Water-vaporproof barrier with desiccant (rigid metal container) Figure 8	IId		
Н	Water-vaporproof barrier with desiccant (container, barrier) Figure 5, Figure 6	IIe		
I	Water-vaporproof with desiccant (rigid container, other than metal) Figure 7	IIf		

Table 2		
CUSHIONING		
LPS Suffix	Type of Material	Material Specification
A	Cellulosic Cushioning	PPP-C-843
В	Flexible Corrugated	PPP-P-291
С	Bound Fiber – Type III, Class B, Medium Firm	PPP-C-1120
D	Bound Fiber – Type IV, Class B Firm	PPP-C-1120
Е	Polyurethane Foam – Flexible, Type I, Class 2, 1.2 – 1.5 Density	MIL-P-26514
F	Polyurethane Foam – Flexible, Type I, Class 2, 2.0 – 2.4 Density	MIL-P-26514
G	Polyurethane Foam – Flexible, Type I, Class 2, 2.0 – 2.4 Density	MIL-P-26514
Н	Polyurethane Foam – Flexible, Type I, Class 2, 2.5 – 3.0 Density	MIL-P-26514
I	Any of the Above – Supplier Option	_
J	No specific cushioning required	_

Table 3		
CUSHIONING THICKNESS		
LPS Suffix	Cushioning Thickness Required on All Sides of the Item	
A	1/2 inch	
В	1 inch	
С	2 inches	
D	3 inches	
Е	4 inches	
F	5 inches	
G	6 inches	
Н	Not applicable	
X	As required	

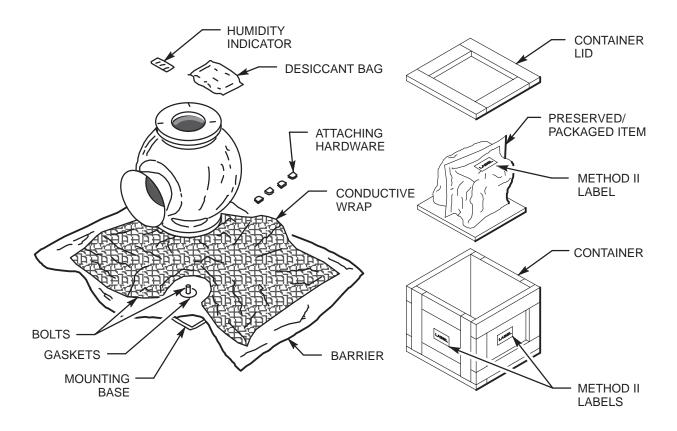


Figure 1. Floating Bag Package

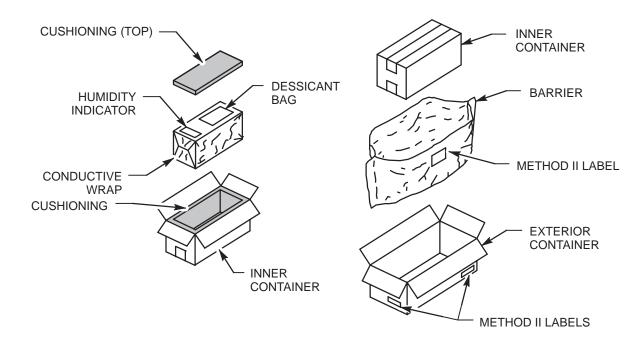


Figure 2. Container, Barrier, Container

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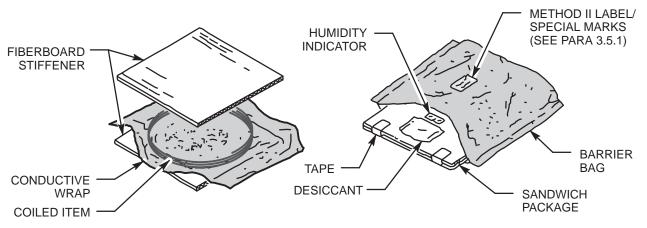


Figure 3. Cushioned Item Bag - Coiled Item

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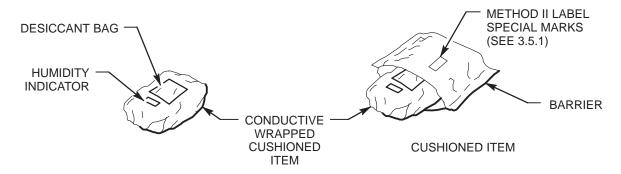


Figure 4. Cushioned Item Bag

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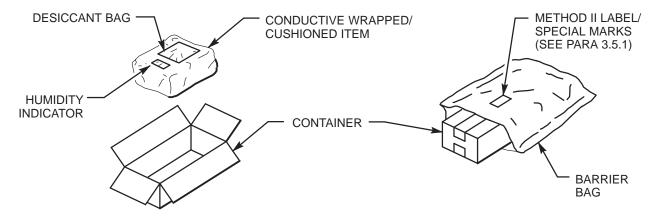


Figure 5. Container, Barrier

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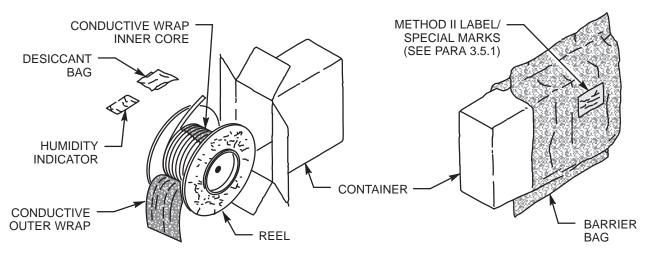


Figure 6. Reel Package

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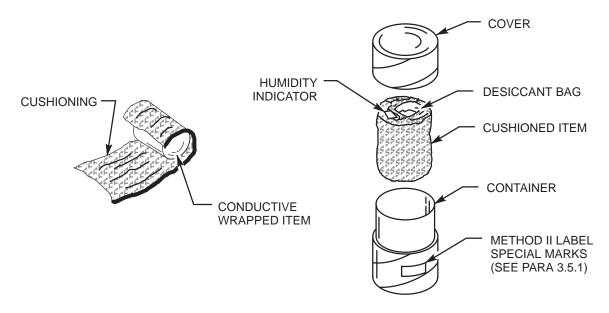


Figure 7. Rigid Container (Other Than Metal)

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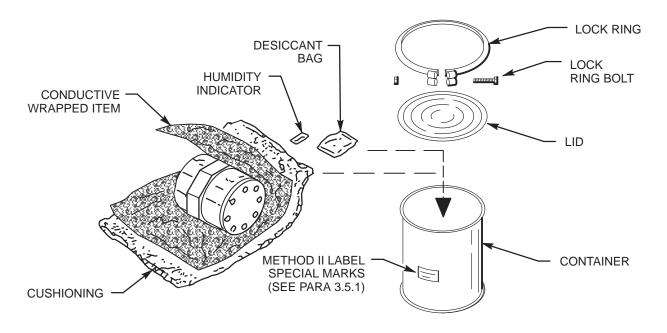


Figure 8. Rigid Metal Container

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