

# LM SPACE PACKAGING STANDARD

Revision 1.0

02/03/2022

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## PACKAGING OF ELECTRONIC CHASSIS

### 1. SCOPE

This standard provides methods for packaging electronic chassis. This standard only applies to shipments from Lockheed Martin Space (LM Space) facilities. It does not apply to suppliers. Exceptions or additional requirements shall be specified by the purchase order or work instruction.

### 2. APPLICABLE DOCUMENTS

The following documents, of the latest issue, form a part of this standard to the extent specified herein.

#### 2.1. LMSSC DOCUMENTS

P-40	General Requirements and Commercial Packaging
MPI-441008	Protection of Electrostatic Discharge Sensitive (ESDS) Devices

#### 2.2. GOVERNMENT DOCUMENTS

PPP-C-795	Plastic Film, Cushioning, Flexible, Cellular (Regular Non-Antistatic Bubble Wrap)
A-A-59135	Sheet, Closed Cell Polypropylene Foam (Microfoam Sheeting)
A-A-3174	Plastic Sheet, Polyolefin
A-A-1898	Cushioning Material, Packaging, Closed Cell Foam Plank, Polyethylene, Density: 2.0 pcf
MIL-PRF-26514	Polyurethane Foam, Flexible, for Packaging, Density: 2.0 pcf

#### 2.3. INDUSTRY DOCUMENTS

ASTM D5118	Corrugated Fiberboard Boxes, Class: Domestic, Variety: Single Wall, Style: Regular Slotted Container, Grade: ??
ASTM D5118	Corrugated Fiberboard Boxes, Class: Domestic, Variety: Double Wall, Style: Regular Slotted Container, Grade: ??
ASTM D5168	Corrugated Fiberboard Boxes, Class: Domestic, Variety: Triple Wall, Style: Regular Slotted Container, Grade: ??
ASTM D5486	Pressure-sensitive, Water Resistant Tape
ASTM D5749	Reinforced Gummed Tape
ASTM D3953	Strapping, Flat Steel, Heavy Duty, ¾" wide x 0.031" thick
ASTM D3953	Strapping Seals, Snap-on or Open
ASTM D3950	Strapping, Polypropylene, ½" wide x 0.030" thick
ASTM D3950	Seals for Polypropylene Strapping, Open Style, for ½" wide x 0.030"
PS 1	Structural Plywood, Interior Grade
Commercial	Fiberboard or Metal Edge Protectors
Commercial	Earth Cell 1450, Bio-Based Polyol Cushioning Material

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### 3. REQUIREMENTS

#### 3.1. GENERAL

- 3.1.1. If there are any conflicts between this documents requirements and released engineering, the released engineering takes precedence.
- 3.1.2. The requirements of P-40, General Requirements for Commercial Packaging, also apply.
- 3.1.3. If the chassis is sensitive to electrostatic discharge, refer to the requirements in MPI-441008.
- 3.1.4. Any loose item(s) required per part shall be enclosed in a separate bag.
- 3.1.5. A chassis having irregular shapes, projections, or appendages shall be cushioned in a manner to protect ports, connectors, fittings, etc. Examples of projections are shown below



- 3.1.6. Cushioning calculations (see Task Folder 15-00056) were based on an estimated chassis fragility of 85G's. Refer to MIL-STD-2073, Table I). Drop heights were based on Table 4-2 in the N2.3-T1-ProdProt-1.0-S1, PHST Standard.

**3.2. UNIT PACKAGING SUMMARY**

**Table I – Unit Pack Options**

<b>Option No</b>	<b>Chassis Weight</b>	<b>Chassis Height</b>	<b>QUP</b>	<b>Fiberboard Container</b>	<b>Cushioning</b>	<b>Maximum Container Wt</b>
1	Less than 45 lbs	Less than 6"	1	Single Wall	4" Grey Polyurethane	65 lbs
2	Less than 45 lbs	6" or more	1	Single Wall	2" Grey Polyurethane	65 lbs
3	45 lbs to 90 lbs	3.5" to 11"	1	Double Wall	2" White Polyethylene	100 lbs
For items not falling into the above options, contact Product Protection Engineering for further assistance.						

**3.3. UNIT PACKAGING DETAILS**

**3.3.1. Option 1 – One Chassis Weighing less than 45 pounds with a height 6 inches or less**

- 3.3.1.1. Wrap chassis with polyethylene film (A-A-3174), non-antistatic bubble pack (PPP-C-795) or microfoam sheeting (A-A-59135).
- 3.3.1.2. Place wrapped chassis in a single wall fiberboard box lined with 4" minimum polyurethane ether cushioning material.
  - 3.3.1.2.1. Ensure that 4" thickness of cushioning is measured from the fiberboard box to any projection from the face or back panel of the chassis. Do not cut this cushioning to make way for projections.
- 3.3.1.3. Close the fiberboard box with 2" minimum width of pressure sensitive tape (preferred method) or reinforced gum tape.
- 3.3.1.4. Apply fragile and up arrow labels to the exterior of the fiberboard shipping container.

**3.3.2. Option 2 – One Chassis Weighing less than 45 pounds with a height 6 inches or greater**

- 3.3.2.1. Wrap chassis with polyethylene film (A-A-3174), non-antistatic bubble pack (PPP-C-795) or microfoam sheeting (A-A-59135).
- 3.3.2.2. Place wrapped chassis in a single wall fiberboard box lined with 2" minimum polyurethane ether cushioning material.
  - 3.3.2.2.1. Ensure that 2" thickness of cushioning is measured from the fiberboard box to any projection from the face or back panel of the chassis. Do not cut this cushioning to make way for projections.
- 3.3.2.3. Close the fiberboard box with 2" minimum width of pressure sensitive tape (preferred method) or reinforced gum tape.
- 3.3.2.4. Apply fragile and up arrow labels to the exterior of the fiberboard shipping container.

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### **3.3.3. Option 3 – One Chassis weighing between 45 and 100 pounds**

- 3.3.3.1.** Wrap chassis with polyethylene film (A-A-3174), non-antistatic bubble pack (PPP-C-795) or microfoam sheeting (A-A-59135).
- 3.3.3.2.** Place wrapped chassis in a double wall fiberboard box lined with 2” minimum pad of polyethylene.
  - 3.3.3.2.1.** Ensure that 2” thickness of cushioning is measured from the fiberboard box to any projection from the face or back panel of the chassis. Do not cut this cushioning to make way for projections.
- 3.3.3.3.** Close the double wall fiberboard box with 2” minimum width of pressure sensitive tape (preferred method) or reinforced gum tape applied over all seams and corners of the box. The tape shall extend over the corners and edges of the box a minimum of 2.5 inches onto the adjacent box panel.
- 3.3.3.4.** Apply heavy, fragile and up arrow labels to the exterior of the fiberboard shipping container.

### **3.4. PACKING**

- 3.4.1.** Containers which meet the requirements of Section 3.3 may be used as shipping containers.
- 3.4.2.** Enclose or attach a copy of the packing slip to the shipping container.
- 3.4.3.** Chassis packed in accordance with Section 3.3.1 or 3.3.2 may be consolidated onto a wooden pallet, banded and/or shrink wrapped in place. If they are banded in place, edge protectors shall be used to spread the load. They may also be consolidated into a cleated-plywood container or triple wall fiberboard container.

### **3.5. QUALITY ASSURANCE**

Not applicable, unless unique inspection requirements are driven by a specific program.

## **4. NOTES**

If assistance is required or the item does not fall into one of the options listed above, contact LM Space Product Protection Engineering or your local transportation department for further assistance.

**REVISION HISTORY**

<b>Release Date</b>	<b>Rev</b>	<b>Change Description</b>	<b>Responsible Engineer</b>
10-09-2015	0.0	Original Release. Task 15-00056.	Bill Manning
02-03-2022	1.0	<a href="#">Project ID: 22-07595</a> . Administrative change to remove packaging options 4 & 5. Updated signature block.	Joshua D. Harris

**APPROVALS**

<b>Approvers</b>	<b>Disciplines</b>	<b>Date: MM-DD-YYYY</b>
Kevin Farrauto	PHST (SME) - SVL	02-03-2022
Tom Shanley	PHST (Lead)	02-03-2022
Robert Chaffin	Shipping Manager – Denver	02-03-2022
Paige Commins	Shipping Manager – SVL	02-03-2022
Joshua D. Harris	Product Protection Engineering Manager	02-03-2022