LM SPACE PACKAGING STANDARD
P-127
Revision 1.1

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 (+0, -0.5) pcf

2.3. INDUSTRY DOCUMENTS

ASTM D1974	Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
ASTM D5118	Standard Practice for Fabrication of Fiberboard Shipping Boxes
ASTM D5168	Standard Practice for Closure of Triple-Wall Corrugated Fiberboard Containers
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	Polyethylene Film/Bag, 4 mil. Thickness or Greater

3. REQUIREMENTS

3.1. GENERAL

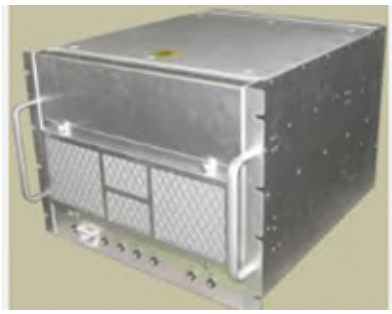
3.1.1. If there are any conflicts between this documents requirements and released engineering, the released engineering takes precedence.

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 SPD00252, PHST Standard.

3.2. UNIT PACKAGING SUMMARY

Table I – Unit Pack Options

Option No	Chassis Weight	Chassis Height	QUP	Fiberboard Container	Cushioning	Maximum Container Wt
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 on container evaluation.						

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), microfoam sheeting (A-A-59135), or commercial equivalent polyethylene film or bag, with a minimum thickness of 4 mil.

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 IAW ASTM D1974, Sealing Method B.

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), microfoam sheeting (A-A-59135), or commercial equivalent polyethylene film or bag, with a minimum thickness of 4 mil.

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 IAW ASTM D1974, Sealing Method B.

3.3.2.4. Apply fragile and up arrow labels to the exterior of the fiberboard shipping container.

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), microfoam sheeting (A-A-59135), or commercial equivalent polyethylene bag or wrap, with a minimum thickness of 4 mil.

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 IAW ASTM D1974, Sealing Method B.

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 or contract.

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

Release Date	Rev	Change Description	Responsible Engineer
10-09-2015	0.0	Original Release. Task 15-00056.	Bill Manning
02-03-2022	1.0	Project ID: 22-07595. Administrative change to remove packaging options 4 & 5. Updated signature block.	Joshua D. Harris
05-31-2024	1.1	Project ID: 24-11884 Administrative changes to allow commerical grade or equal of PPP-C-795. Added sealing methods for ASTM D1974. Updated signature block.	Tasha Craig

APPROVALS

Approvers	Disciplines	Date: MM-DD-YYYY
Kevin Farrauto	PHST (Lead) - SVL	05-14-2024
Evan Lockard	PHST (Lead) - Denver	05-22-2024
Robert Chaffin	Shipping Manager – Denver	05-14-2024
Paige Commins	Shipping Manager – SVL	05-14-2024
Damian Prado	Shipping Supervisor-SVL	05-17-2024
Joshua D. Harris	Product Protection Engineering Manager	05-31-2024