
GRAPHITE EPOXY PREPREG MATERIALS REQUIRING REFRIGERATION

1.0 SCOPE

This standard provides for the packaging of graphite/epoxy prepreg materials requiring refrigeration during shipment and storage.

2.0 REFERENCES (CURRENT ISSUE)

- 2.1 Lockheed General Packaging Standard LPS 40-001 (General Requirements Specification)
- 2.2 Hazardous Materials Regulations, Department of Transportation
- 2.3 Uniform Freight Classification
- 2.4 Consolidated Freight Classification
- 2.5 National Motor Freight Classification

3.0 REQUIREMENTS

3.1 GENERAL

- 3.1.1 The quantity per unit package shall be as specified in the LMSSC Material Specification, procurement document, or if unspecified, quantity shall be as commonly furnished by the supplier.
- 3.1.2 The supplier's package shall meet or exceed the General Packaging Requirements of LPS 40-001.
- 3.1.3 Shipments of items/materials classified as hazardous; e.g., compressed gas, poisons, etc., shall be properly identified, packaged and marked in compliance with applicable carrier/state/federal regulations.
- 3.1.4 Preservation/packaging methods and designs shall be of minimum cost consistent with adequate performance. The preservation/packaging methods selected shall ensure protection of the item(s) against natural and induced environments during handling/shipment.
- 3.1.5 The environment of packaged material shall be maintained in accordance with the applicable material specification during shipment.
- 3.1.6 The shipping container shall be selected to ensure material protection consistent with the mode of transportation required.

3.2 UNIT PACKAGING

- 3.2.1 Wound or Rolled Material (Figure 1, Figure 2, Figure 3 & Figure 4)
 - 3.2.1.1 The type of cores shall be as specified in the applicable LMSSC material specification.
 - 3.2.1.2 Enclose each roll of material in a Class 1 or 3 MIL-B-131 barrier bag. Evacuate excess air by vacuum to minimize moisture condensation on material surface so as to draw the barrier closely around the roll of material and ends of core.
 - 3.2.1.3 Rolls of cloth wound on cores shall be axially supported on saddles, top and bottom, to prevent contact of the rolls with the insulation or the box interior.
- 3.2.2 Tape on Reels or Spools (Figure 5)
 - 3.2.2.1 Material such as tape wound on reels or spools shall be enclosed in barrier bags (see Paragraph 3.2.1.2) and stacked in insulated containers.
- 3.2.3 Material Supplied in Cans, Tubes, Plastic Containers, Bags, etc.
 - 3.2.3.1 Containers shall be adequately sealed against leakage and furnished in sizes consistent with the procurement document. Provide sufficient cushioning/dunnage to protect contents from leakage or damage during shipment.

3.3 SHIPPING CONTAINER

- 3.3.1 Unless otherwise specified, the number of unit packages per shipping container (containing identical parts) shall be limited to the dimensions and gross weight provisions of the container specification (reference item Number 222 of the National Motor Freight Classification).

3.3.2 The shipping container shall be a corrugated fiberboard box, (Regular Slotted Container (RSC) or Full Overlap Slotted Container (FOL) style) meeting Common Carrier regulations.

3.4 PACKING

3.4.1 Packing for Temperature Controlled Vehicle Shipment

3.4.1.1 Shipping containers to be transported in temperature controlled vehicles do not require carbon dioxide solid (dry ice) or temperature recorders in each container of material.

3.4.1.2 Pack rolls of cloth wound on cores in individual fiberboard containers (Figure 1).

3.4.1.3 Pack tape on reels or spools per Para 3.2.2.1 and Figure 5.

3.4.1.4 Pack material supplied in cans, tubes, plastic containers, bags, etc., per 3.2.3 and Figure 5.

3.4.2 Monitoring temperature controlled Vehicle Shipments

3.4.2.1 A minimum of 2 (two) temperature recorders are required per shipment. Place recorders at opposite ends of the load of material if less than truck load quantity or at opposite ends of the truck cargo compartment if truck load quantity.

3.4.3 Packing for Air Shipments or Nontemperature Controlled Vehicle Shipment

3.4.3.1 Material shall be enclosed in a container that is fully insulated with provision for placement of carbon dioxide solid (dry ice) within the container for low temperature maintenance while in transit (see Figure 2, Figure 4 & Figure 5).

3.4.3.2 Include adequate amount of dry ice in tip, side or center of the container (see Figure 2, Figure 4 & Figure 5). The dry ice weight shall be 50 pounds minimum, or an amount equal to 50% of the product weight whichever is greater.

3.4.3.3 Unless otherwise specified in the procurement document, secure a recording thermometer in the package (Figure 2, Figure 4 & Figure 5) separated and opposite from the dry ice. The device shall have a range of at least -30°F to 70°F.

3.4.3.4 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

3.5.1.1 Label or mark each unit bag to include at least the following:

- a. Material supplier and designation
- b. purchase order number
- c. Specification number and revision letter
- d. Date of manufacture
- e. Material class and type, as applicable
- f. Size/quantity as applicable
- g. Lot number
- h. Roll number
- i. Warning: Moisture is detrimental to material if required by P.O. or spec
- j. Maximum 0°F storage required unless specified otherwise in material specification
- k. Limited-calendar-life control marking in accordance with the requirements of the material specification or purchase order.
- l. Marking should be limited to that required by the PO or material specification.

3.5.1.2 Markings to remain legible until material is used.

3.5.2 Shipping Container Marking

- 3.5.2.1 In addition to any special marking required by the material specification, contract, or order, label or mark each package to include the following:
- a. Part number per procurement document
 - b. Material description
 - c. Specification number and revision letter
 - d. Purchase order number
 - e. Manufacturer's name, trademark, or symbol
 - f. Manufacturer's lot number
 - g. Date of manufacture
 - h. Manufacturer's batch number
 - i. Manufacturer's prepreg designation
 - j. Nominal width and length per reel/roll/sheet/spool
 - k. Net linear feet per reel/roll/spool
 - l. Gross weight
 - m. Limited-calendar-life control marking per Paragraph 3.5.1.1.
 - n. Precautionary handling/storage restrictions and markings as required; e.g., "This side UP," "Wear Gloves if Handling Dry Ice," "Material Must be Maintained at 0°F or Colder, Do not Store in Direct Sunlight"
 - o. Special markings required for shipments by air, "Class 9, DRY ICE" (include weight of dry ice). For compliance with Department of Transportation (DOT).

3.5.3 Apply special handling and precautionary markings as required:

- a. Special and precautionary handling labels shall meet ASTM D5445., Pictorial Marking for Handling of Goods.
- b. Maximum 0°F storage required unless specified otherwise in material specification.
- c. Limited-calendar-life control marking in accordance with the requirements of the material specification or purchase order.
- d. Limited-calendar-life control marking per Paragraph 3.5.1.1.

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 goods or packages in which the recording charts indicate noncompliance with Paragraphs 3.4.2.1 and 3.4.3.3 or when damage or degradation is attributable to improper or inadequate packaging. Return of such goods shall be at the supplier's expense.
- 4.2 Evidence of calibration of the temperature recorder shall be maintained and filed by the vendor, and traceable to the National Bureau of Standards.

5.0 NOTES

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

<u>Commodity</u>	<u>Military/Commercial Specifications</u>
Barrier Material, Waterproof	MIL-B-131, Class 1 or 3
Box, Fiberboard	ASTM D5118, Type CF, Class Domestic, SW, Style RSC, Grade 44 ECT or 200 Mullen
Polystyrene	MIL-P-19644, Type 1, Class 2 or 3
Cushioning, Polyethylene	A-A-59135, Class 2, Grade B (for sheet material) A-A-59136, Class 1, Grade B, Type 1 (for plank material)
Temperature Recorder	Commercially Available (Suggestion; Pacific Transducer Corp)
Fiber Box, Closing	ASTM D1974

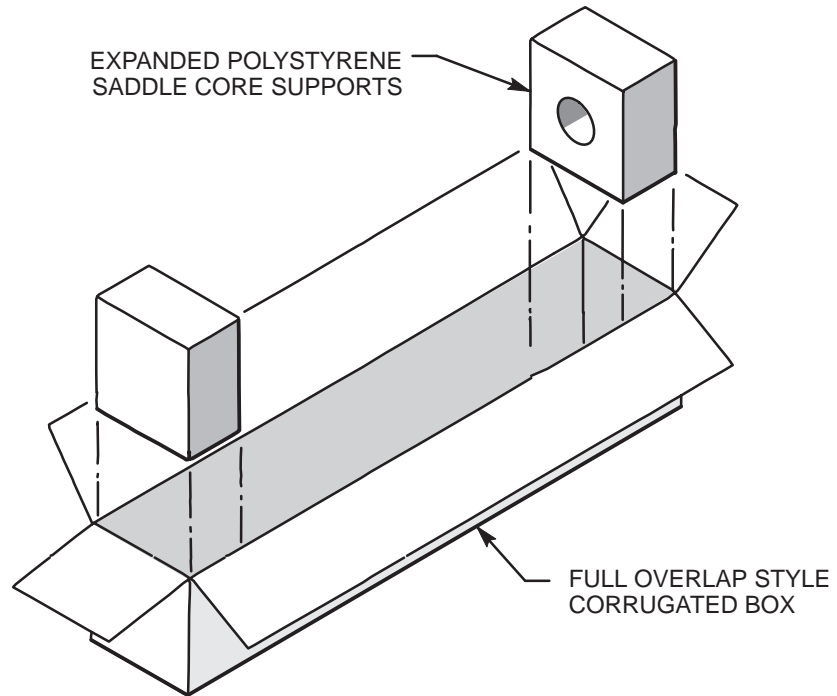
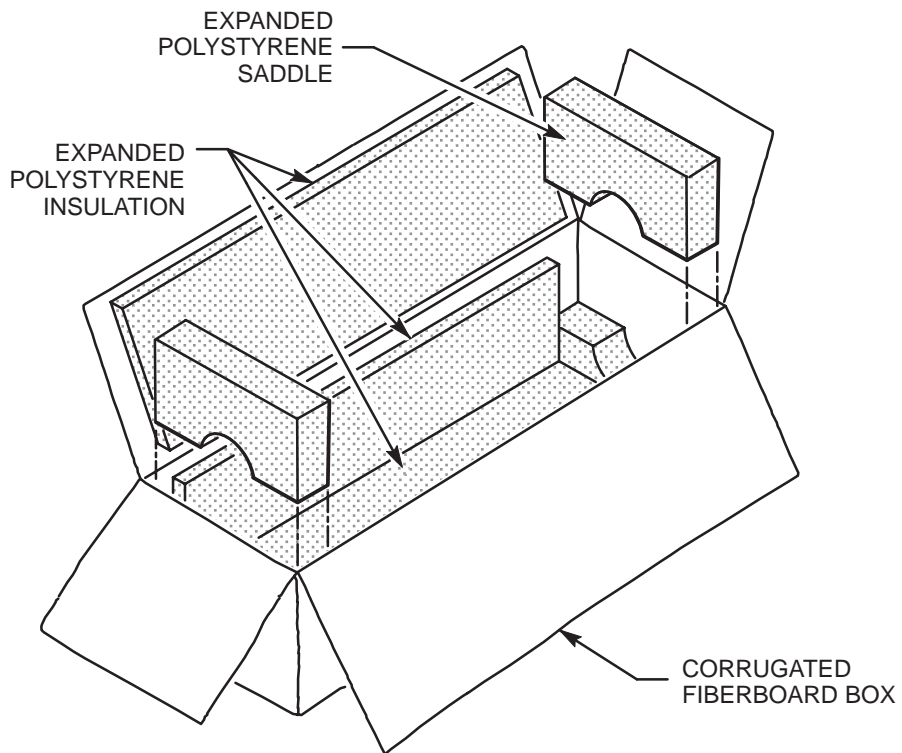


Figure 1. Typical Package Design for Rolled Materials shipped by Refrigerated Vehicle

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NOTE: Place Dry ice below rill of material. Place temperature recorder in same cavity. Recorder may not be in contact with dry ice.

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Figure 2. Insulated Container for Air Freight or Non-environmentally Controlled Transportation of Rolled Material

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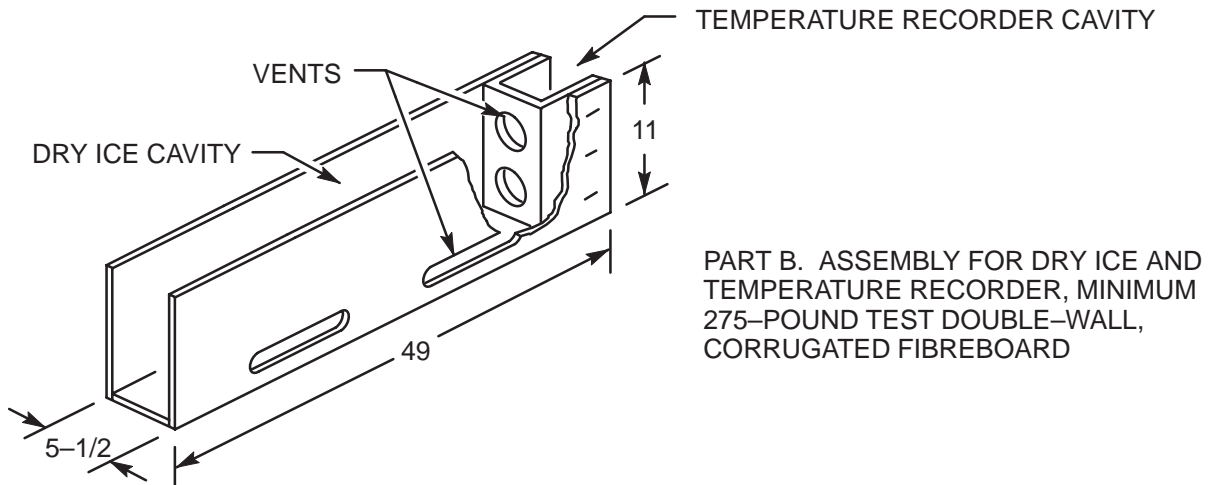
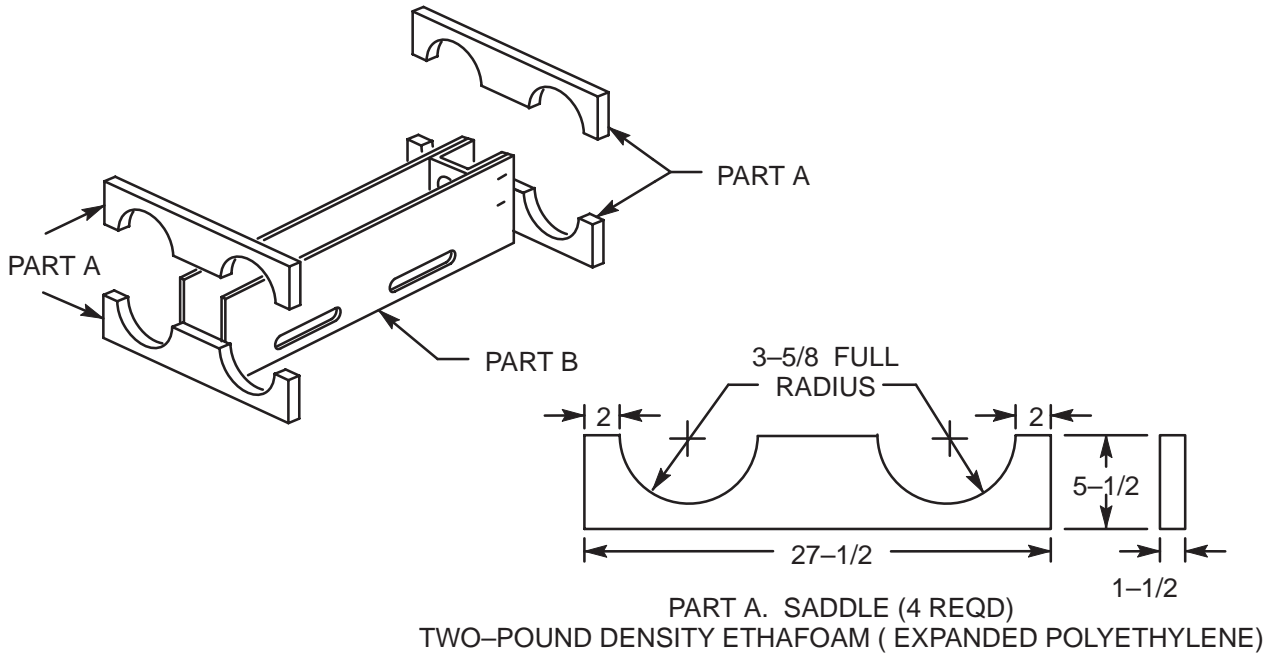


Figure 3. Saddle Assembly for Rolles of Material

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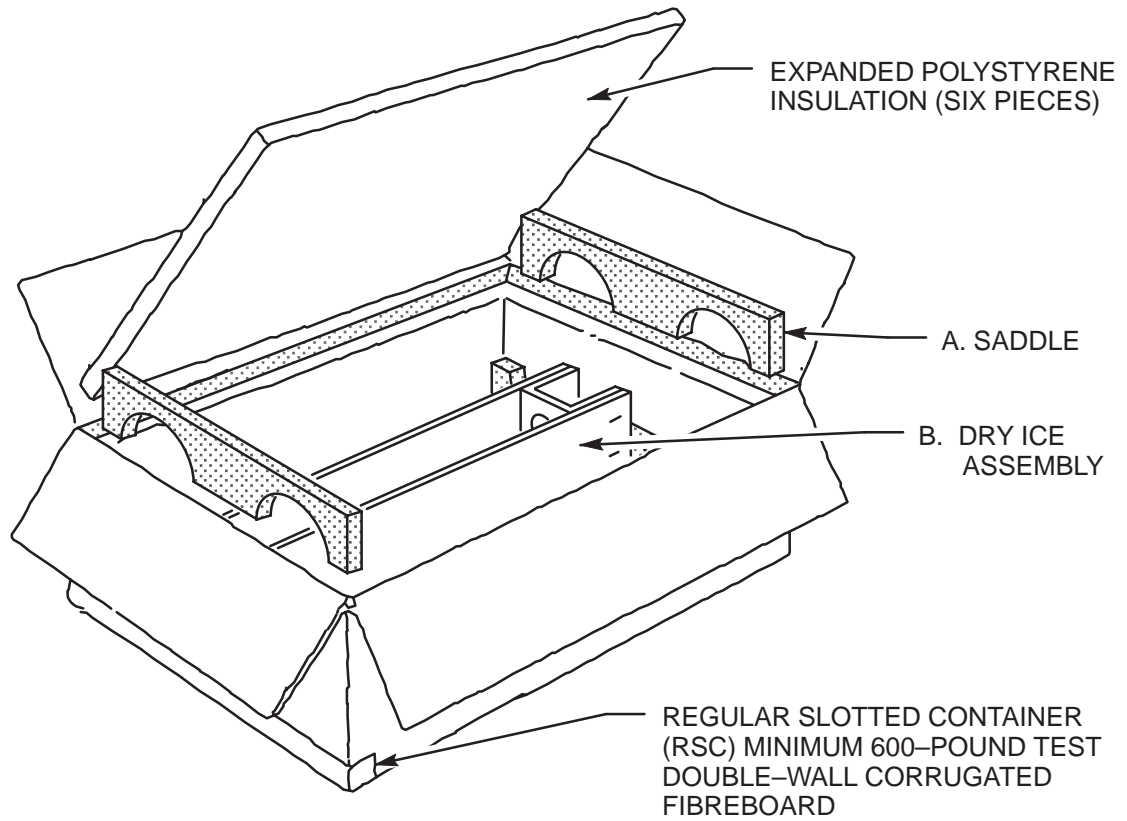


Figure 4. Package Assembly for Rolls of Cloth

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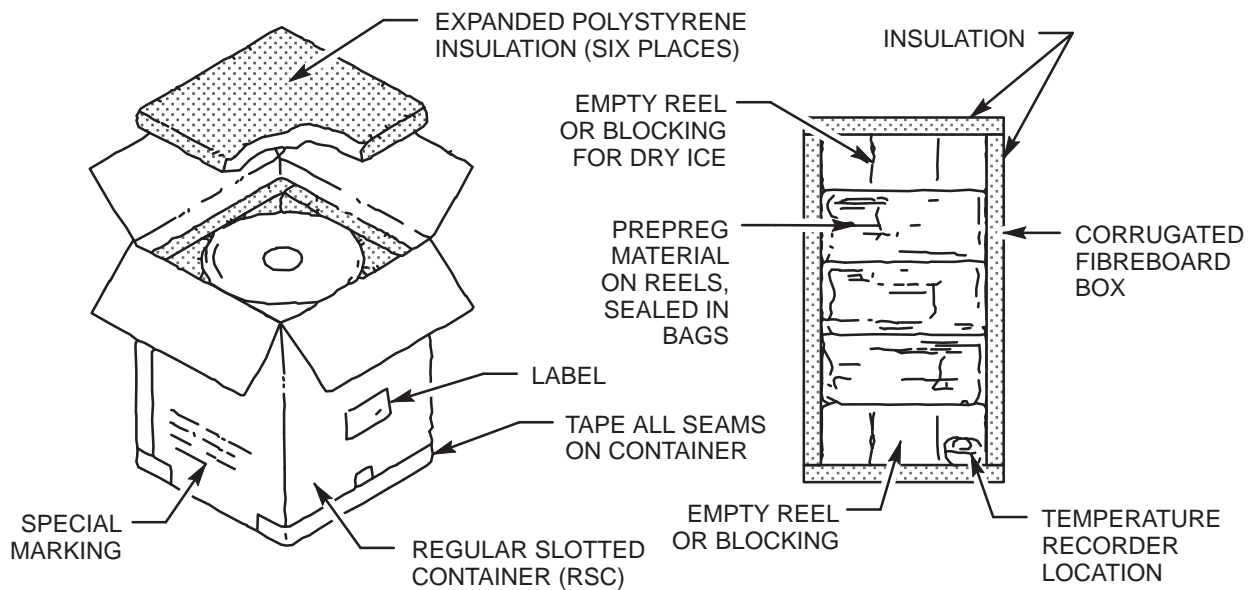


Figure 5. Typical Package Design for Tape on Reels

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