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## REUSABLE CASES AND TOOL CONTAINERS

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### 1.0 SCOPE

This standard provides instruction for the use of reusable cases and tool containers for shipping and transportation. This standard is not applicable when contractual requirements impose military or NASA packaging standards (i.e., MIL-STD-2073 or NASA NPR 6000.1).

### 2.0 REFERENCES

2.1 LMSSC Packaging Standards LPS 40-001

### 3.0 REQUIREMENTS

#### 3.1 GENERAL

- 3.1.1 Shipments of items/materials classified as hazardous, e.g., flammable, toxic, combustible, corrosive, compressed gas, magnetic, radioactive, poisons, oxidizing materials, etc., shall not be packaged per this standard.
- 3.1.2 Reusable cases are typically manufactured from steel, aluminum or plastic materials. They may be known as shipping cases, transit cases or equipment cases. Reusable cases should be selected based on the protection they provide from handling, transportation and storage environments. They typically provide shock and vibration mitigation through the use of corner mounts, spring suspensions or foam cushioning material. Gaskets and desiccated breathing valves are often provided to ensure water vaporproof closure.
- 3.1.3 Reusable tool containers are typically manufactured from steel, aluminum, plastic or wood materials. Tool containers are designed for tool storage and may not provide adequate protection for shipping and transportation environments.

#### 3.2 UNIT PACKAGING

3.2.1 The reusable case or tool container is considered the unit package.

#### 3.3 INTERMEDIATE PACKAGING – (Consolidation of unit packages, when applicable)

3.3.1 Not Applicable.

#### 3.4 PACKING (Shipping Container)

- 3.4.1 **Container Inspection:** Reusable cases and tool containers must be visually inspected prior to shipping to ensure adequate product protection is provided for the anticipated handling, transportation and storage conditions. Exterior attachments, such as wheels, latches, handles and support legs, must also be inspected for adequate protection. LMSSC personnel should contact Product Protection Engineering for assistance.
- 3.4.2 **Reusable Cases and Tool Containers as Shipping Containers:** Reusable cases and tool containers may be used as shipping containers if they provide adequate product protection and any exterior attachments can withstand the shipping environment. Closure gaskets, breathing valves and shock isolators should be inspected for damage. Desiccants should also be replaced prior to packing. Tool container design may be under configuration control and require formal approval of any modifications to internal blocking and bracing or the container structure. LMSSC personnel should contact Product Protection Engineering for assistance.
- 3.4.3 **Overpacking Reusable Cases and Tool Containers:** If this visual inspection of reusable cases or tool containers determines they provide inadequate protection, it will be necessary to overpack those containers in an appropriate shipping container.

- 3.4.3.1 . **Delicate Products or Equipment:** Reusable cases or tool containers containing delicate products or equipment should be overpacked in fiberboard boxes (Figure 1) or wood boxes (Figure 2). A minimum clearance of 2 inches shall be provided between the reusable case or tool container and the fiberboard or wood box. This void is to be filled with dunnage or cushioning material appropriate for the product fragility rating. Loose fill material shall be avoided. It may be necessary to wrap the reusable case or tool container in polyethylene film to avoid binding when placing the reusable case in the transport package. LMSSC personnel should contact Product Protection Engineering for assistance.
- 3.4.3.2 . **Sturdy Products or Equipment:** Reusable cases or tool containers may be packed on pallets to ensure mechanical handling (Figure 3). Statistically, mechanical handling provides shorter drop heights than manual handling. Cases and tool container shall be blocked in place to limit horizontal movement. Tiedown strapping shall be securely attached to or looped over reusable cases or tool containers. It shall be anchored to the pallet by looping around a load-bearing member or by utilizing steel anchor plates. Padding material or suitable edge protectors shall be used under the straps to prevent damage to the reusable case or tool container. All tiedown strapping shall be tensioned and sealed securely.

#### **4.0 LABELING (WHEN APPLICABLE)**

- 4.1 Shipping Container Marking – Label or mark each container per contracting document requirements.
- 4.2 Special, precautionary and handling marking shall be applied as required.

#### **5.0 QUALITY ASSURANCE**

- 5.1 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.

#### **6.0 NOTES**

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

##### **6.1.1 DEFINITIONS**

**Blocking:** Blocking materials are used to prevent or control movement.

**Bracing:** Bracing materials or articles are used to hold products in position within a container.

**Cushioning:** A material used to reduce shock and vibration transmitted to a packaged product from an externally applied force.

**Dunnage:** Materials used to fill spaces or voids in a container. Many wrapping materials are used as dunnage. Dunnage materials are not part of the container.

**Overpacking:** Packaging that exceeds minimum requirements, used to increase protection.

**Pallet:** A low, portable platform of wood, metal, or plastic to facilitate handling, storage and transportation of material as a unit.

**Skid:** One of a pair or series of parallel wooden runners affixed to the underside of boxes or crates to allow entry of fork lifts and pallet jacks.

**Fragility Rating:** The maximum acceleration that any specific item can withstand in any direction before breakage, damage, or malfunction occurs (also known as G-factor or G-value).

6.1.2 **REFERENCES**

<b><u>Commodity</u></b>	<b><u>Military/Commercial Specifications</u></b>
Box, Single or Double Wall Fiberboard	ASTM D 5118 and ASTM D1974 (Closure)
Box, Triple Wall Fiberboard	ASTM D5168
Pallets, Wood	A-A-52586
Box, Wood	ASTM D6880
Box, Cleated Plywood	ASTM D6251
Box, Load Bearing	ASTM D6256
Cushioning, Polyurethane	MIL-PRF-26514, Type 1, Class 2, Grade B
Cushioning, Polyethylene	A-A-59136, Class 1, Grade A. Type 1
Dunnage, Padpack	A-A-59311
Dunnage, Bubblepack	PPP-C-795
Dunnage, Microfoam	A-A-59135, Class 2



**Figure 1. Delicate Product/Equipment – Fiberboard Box Overpack**

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Figure 2. Delicate Product/Equipment – Wood Box Overpack





Figure 3. Sturdy Products/Equipment – Palletized Cases and Tool Containers

