BLUE ORIGIN

Supplier Packaging Requirements

CMCD-00481-D

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1. INTRODUCTION

This standard establishes the general requirements and guidelines of supplier packaging of commodities for domestic and international shipments and storage for a minimum of 90 days from the time of receipt. This standard shall be used when referenced on documents of procurement, part specifications, drawings, and other packaging standards or specifications.

1.1. Terminology

The following acronyms, abbreviations, and terms are used in this document as defined herein:

Nomenclature	Definition
Caution	If not adhered to, could cause damage to hardware or GSE (Ground Support Equipment)
CoG	Center of Gravity
FOD	Foreign Object Debris
GC	Gross Cleaned
GN2	Gaseous Nitrogen
PO	Purchase Order
Shall or must	Indicates items of a mandatory nature
Should, may, or can	Indicates items of a non-mandatory nature

2. REFERENCES

The references listed below form a part of this document to the extent specified herein. Unless otherwise specified, the latest issue of the reference should be used.

2.1. U.S. Government

49 CFR	Title 49. Code of Federal Regulations
MIL-STD-2073-1	Standard Practice for Military Packaging
NAS853	Field Force, Protection From
NASA NPR 6000.1H	Requirements for Packaging, Handling, and Transportation for Aeronautical and Space Systems, Equipment, and Associated Components

2.2 International

ASTM D3951	Standard Practice for Commercial Packaging
ASTM D6251	Standard Specification for Wood-Cleated Panelboard Shipping Boxes

3. REQUIREMENTS

3.1. General Supplier Packaging Requirements

The packaging materials and equipment shall meet or exceed the requirements specified herein.

Unless specific packaging instructions are provided with the PO, shipments shall be packaged in such a manner that the shipment is protected from the hazards of anticipated transportation conditions. At a minimum, unit/individual packaging (i.e. Method 10 preservation, per MIL-STD-2073-1) shall be used to protect the part from physical and mechanical damage.

Each package shall provide adequate preservation and protection to prevent damage or deterioration of the item during shipment and storage, given normal environmental conditions and commercial transportation modes. Guidance for preservation and packaging methods may be found in ASTM D3951 and in MIL-STD-2073-1. Individually label each package per ASTM D3951.

The packaging materials, procedures, and handling shall be of commercial quality and practice to ensure the materials are protected against corrosion and deterioration, physical, chemical, and mechanical damage, degradation during storage, and multiple handling.

NAS853 (Field Force, Protection From), the standard for the protection of items, components, and assemblies, e.g., field effect transistors, micro diodes, etc., shall be used where protection from force fields is needed (electrostatic, electromagnetic, magnetic, or radioactive). Specific ESDS (Electrostatic discharge sensitive) protection instructions may be found in MIL-STD-2073-1, Para. 5.2.4.1. "Pink Poly" shall never be used as a primary barrier. Velostat is preferred.

3.2. Unit Packaging

All critical surfaces (i.e. mating surfaces) must be protected with cover plates, vinyl caps, or approved film and tape.

Parts must be wrapped/padded/braced/separated to prevent any metal-to-metal contact. Part must be positioned in the most stable orientation while maintaining the lowest possible center of gravity.

Unit package closure must prevent accidental opening during shipment, handling, and storage. Guidance for QUP (Quantity per Unit Pack) may be found in MIL-STD-2073-1, Appendix B.

3.3. Cleanliness

In the event that Blue Origin Contamination Engineering has imposed cleanliness requirements (per IEST-STD-CC1246) upon a part or assembly, it will be specified on the PO. As such, the inner barrier/inner packaging must maintain part cleanliness and be as clean or cleaner than the part. Contact Blue Origin PHS&T for clean packaging guidance.

3.4. Hardware Securement

Part must be secured to the base of the crate by one or more of the following methods:

- Lighter parts may be secured in place and prevented from shifting during transit by use of dunnage.

CAUTION:

DO NOT RE-USE FOAM-IN-PLACE / INSTAPAK CUSHIONS. THIS MATERIAL IS INTENDED FOR SINGLE-USE ONLY.

- Heavier parts must be blocked in place by means of 2x dimensional lumber and screws to secure them to the base platform to prevent horizontal/lateral movement.
- Bracing blocks must be secured directly to dimensional lumber base, or through plywood to 4x4 supporting stringer blocks at a minimum of 2 locations.
- Parts must also be secured to prevent vertical movement. This can be achieved through use nylon straps connected to D-rings which are mounted directly to the crate/pallet base, which must be secured directly to dimensional lumber base, or through to 4x4 stringer blocks.
- When banding is used to secure forgings, corner edge protection must be used in order to prevent metal-to-metal contact and not allow forgings to come into contact with other forgings. If edge/corner protection is not sufficient, use corrugated material to ensure adequate division between forgings.

3.5. Workmanship Requirements

NOTE:

PRIOR TO LOADING HARDWARE, ENSURE CONTAINER IS CLEAN AND DRY AND FREE OF FOD (INCLUDING WATER).

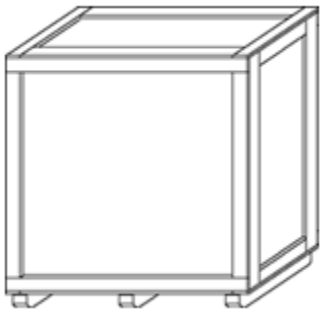
All straps used to tie down hardware/finished parts must have a minimum WLL (Working Load Limit) that is 2 x's the weight of the part.

Supporting pallet must be completely under the part and not allow part to be over-hanging. Preferred distance from pallet edges is a minimum of 2".

In order to accommodate handling access of forklifts and pallet jacks, all crates, containers, and pallets must contain openings which provide a minimum of 3.5" clearance from ground to bottom of deck. Other Handling requirements:

- Crate opening must be clearly marked to allow for crate to be opened without use of excessive force which may cause damage to the crate or its contents.
- ASTM D 6251 Style A is preferred, but other styles may be used as deemed appropriate based on the contents.

Figure 1. ASTM D 6251-A



D6251-A

Locking Corners - Cap on Base - Cleated Plywood Deck

NOTE:

FURTHER GUIDANCE MAY BE FOUND IN ASTM D3951, TABLE 1 FOR SUGGESTED WEIGHT AND SIZE LIMITS FOR SHIPPING CONTAINERS.

3.6. Intermediate Packaging

Intermediate packages shall be used when unit packs require additional protection or to consolidate items for ease in shipping, handling, and storage.

3.7. Packing

Wooden boxes shall be constructed per ASTM- and MIL-specifications and be made of lumber and plywood.

NOTE:

NO PARTICLE BOARD IS ALLOWED.

IT IS NOT RECOGNIZED IN THE SPECIFICATIONS AND IT CREATES AND ENGENDERS FOD (FOREIGN OBJECT DEBRIS).

Packing in shipping containers must provide adequate protection during the shipment, handling and storage under normal, anticipated environmental conditions, and must meet the minimum packaging design and fabrication requirements. Part must be positioned in the most stable orientation while maintaining the lowest possible center of gravity.

For further packaging guidance, contact Blue Origin PHS&T (Packaging, Handling, Storage & Transportation).

3.8. Marking

Markings must include:

- Supplier's Name and Address
- Ship-To Address
- Blue Origin Purchase Order Number (or a Point of Contact, if no PO exists)
- Individual PO Line-Item References or package contents
- Supplier Part Number
- Description / Nomenclature

- Quantity Contained in this Shipment

If center of gravity is more than 20% offset from center of crate, labels must be applied to all 4 sides and lid to indicate the approximate CoG (Center of Gravity) for safe handling.

Please utilize 'Do Not Stack', 'Fragile' and other common handling markings/images in large bold letters on a minimum of two opposing sides in an unobstructed location as it is deemed necessary.

3.9. Quality Assurance

The quality assurance and inspection requirements applicable to the item contract apply to the materials and services outlined in this standard.

Upon arrival, Receiving shall inspect the shipment for any visible damages to the packaging and hardware before signing for the shipment. If a shipment's packaging is damaged and hardware is suspected of damage, pictures will be taken, Blue Origin Quality will be notified and the Quality process CMMF-PR0054 (Control of Nonconforming Material) will be followed. Supplier Quality will notify the responsible party for corrective action as applicable.