



Document Number: L1-755I001/04
Supplier Packaging Requirements

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Revision History

Revision	Date	Change
01	04/04/2017	Initial release
02	07/12/17	Updated Barcoding Sections
03	02/22/18	Company name edits.
04	06/04/18	Section edits – General, Barcoding and Documentation. Remove section – Part Marking Added Supplier Packing Requirement Clauses

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Introduction

1.1 Scope, Product, and Site

This instruction covers the packaging of parts, items, equipment and tooling material for the Virgin Orbit program at the Long Beach and Mojave, California facilities.

2 Definitions

2.1 Terms

Table 1 - Terms

Term	Definition
Buyer	Buyer procurement entity
Supplier	The legal entity that is the contracting party with the Buyer with respect to the procurement document(s)
Procurement document	The purchase order or subcontract between the parties
SPRC	Supplier Packaging Requirement Clause imposed on purchase order at each line item.

2.2 Acronyms

Acronym	Definition
ASTM	American Society for Testing and Materials
CFR	Code of Federal Regulations

3 Purpose

This instruction establishes the requirements for effective preservation, packaging, and marking of all Buyer flight material, equipment, and tooling. The Supplier shall preserve, and package material, equipment and tooling to prevent deterioration or damage during shipment and storage under normal environmental conditions and commercial modes of transportation.

4 Requirements

4.1 General - SPRC 4.1

Applied to all items regardless if listed on PO. Using ASTM D3951-15 Standard Practice for Commercial Packaging (unless instructed otherwise), the supplier shall package the product to meet the following requirements:

- 1) Adequately protects the product for shipment and storage at the Buyer's facility for a minimum of one (1) year from the time of receipt.
- 2) Can be handled using standard equipment
- 3) Uniform / consistent size
- 4) Minimizes tare weight and size
- 5) Meets common carrier minimum packaging and handling requirements

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- 6) Can be disassembled using common hand tools with no risk to damage the fit, form or function of the part

If the supplier believes packages used according to this ASTM standard may not adequately protect the product, the supplier shall supplement the packaging using additional materials, or more substantial containers.

4.1.1 Approved Packaging Materials

4.1.1.1 Corrugated Fiberboard

The supplier shall use corrugated fiberboard containers which meet ASTM D5118-15 Standard Practice for Fabrication of Fiberboard Shipping Boxes, and close them by taping or banding.

4.1.1.2 Wood Materials

However, if the supplier determines the capacity of fiberboard containers is exceeded, the supplier shall use wood packaging material (crates/pallets/skids) that complies with ASTM D6880-11 Standard Specification for Wood Boxes, and ASTM D6039-11 Standard Specification for Open and Covered Wood Crates. Closure by use of removable fasteners or steel banding is desired.

4.1.2 Prohibited Packaging Materials

The following materials are prohibited:

- 1) Any materials that may risk damage to the product by corrosion, static electricity, or contamination
- 2) Any preservative which, when removed using a standard technique, may damage the product
- 3) Metal staples when used to secure polyethylene wrapped or bagged items
- 4) Newsprint, polystyrene "chips", "peanuts," "popcorn" or shredded paper for wrapping or cushioning

4.1.3 Unit Pack Quantities

Unless otherwise directed by the purchase order, the supplier shall prepare Quantity per Unit Pack (QUP) in accordance with ASTM D3951-15.

4.1.4 Multiple Unique Items (Part Numbers)

A supplier may consolidate multiple unique items (part numbers) in a container if:

- 1) The container is marked "Multiple items in this container."
- 2) A packing list is attached to the container, and has a list of each individual item, including quantity
- 3) Each item is individually packaged
- 4) Each individual package has a label meeting the requirements in Section 5.
- 5) All items in the package have the same purchase order number.

4.1.5 Individual Items with Multiple Batch / Lot Numbers

If a supplier makes a shipment of individual items (same part number) that come from multiple batches/lots, the supplier shall:

- 1) Pack each batch/lot in individual containers.
- 2) Mark the batch/lot number on each box label.

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4.1.6 Waterproof Barriers

For product that requires a waterproof barrier, the supplier shall use a suitable cover. The supplier shall position the cover(s) to prevent formation of water pockets and to allow air circulation. Plus, the supplier shall cushion sharp points of contact between the product and the cover to prevent tearing.

4.2 Barcoding – SPRC 4.2

4.2.1 Supplier Labeling and Documentation Requirements for Barcoding

All bar codes shall be in 2D format, with a minimum size of ¼” x ¼”. If the container holds one part number, the supplier shall place bar codes on the container label and on the individual item(s) packaged with the following information:

4.2.2 Single Part, Item or Equipment Shipments with Barcoding

- 1) Supplier Name
- 2) Packing Sheet Number
- 3) Total Number of Containers
- 4) VO Purchase Order Number
- 5) VO Work Order Number (if applicable)
- 6) Item Line Number
- 7) Supplier Part Number and Revision Level (if applicable)
- 8) VO Part Number and Revision Level (if applicable)
- 9) Serial Number
- 10) Lot/Batch Number
- 11) UOM
- 12) Quantities and UOM per part number (supplier and/or VO)
- 13) Back order quantity (if applicable)
- 14) Date of Manufacture
- 15) Date of Expiration
- 16) SDS Number (if hazardous material)
- 17) Weight

4.2.3 Multiple Parts, Items or Equipment Shipments with Barcoding

- 1) Supplier Name
- 2) Packing Sheet Number
- 3) Total Number of Containers
- 4) Purchase Order Number
- 5) VO Work Order Number (if applicable)
- 6) Item Line Number
- 7) Supplier Part Number and Revision Level (if applicable)
- 8) VO Part Number and Revision Level (if applicable)
- 9) Serial Number
- 10) Lot/Batch Number
- 11) UOM

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- 12) Quantities and UOM per part number (supplier and/or VO)
- 13) Back order quantity (if applicable)
- 14) Date of Manufacture
- 15) Date of Expiration
- 16) SDS Number (if hazardous material)
- 17) Weight

4.3 Transport and Labeling – SPRC 4.3

4.3.1 Specialized Transport

Such as refrigerated transport shall pre-notify VO receiving and shipping department. Refrigerated shipments require the supplier contact **(800) 674-3153** no less than three (3) business days prior to pending arrival. The supplier shall record a voicemail, which notifies the internal VO team of pending arrival.

The supplier shall mark all shipping containers in accordance with ASTM D3951-15 using permanent ink or paint. If the package requires special handling or storage (can easily tip over, fragile, can be crushed, has stacking limitations) the supplier shall add pictorial markings in accordance with ASTM D5445-15 Standard Practice for Pictorial Markings for Handling of Goods.

4.3.2 Transport of Hazardous Materials

The supplier shall package hazardous materials and dangerous goods for the most restrictive mode of transportation. In addition, the supplier shall pack dangerous goods per United Nation (UN) performance-tested specification packaging.

The supplier shall reference the specifications and standards shown below to determine the packaging requirements for dangerous goods depending on mode of transportation:

- Code of Federal Regulations Title 49 – Transportation
- United Nation’s Recommendation on the Transport of Dangerous Goods
- International Air Transport Association’s Dangerous Goods Regulations (IATA)
- International Maritime Organization’s International Maritime Dangerous Goods Code (IMDG)
- International Civil Aviation Organization’s Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO)

4.3.3 Items Containing Fluids

If the package contains hydraulic, fuel, and oil units including accessories, the supplier shall mark or tag the product indicating the internal flushing, filling, or calibrating fluid used

4.3.3.1 Explosives

The supplier shall meet all requirements of the applicable Code of Federal Regulations.

4.3.3.2 Gas

If the container is a gas tank, the supplier shall place labels on the tank that identify the type of gas or gases, fraction of each gas, hazards, and any DOT required information.

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4.3.4 Commercial Shipment Documentation

The supplier shall include a standard commercial packing list with all material enclosed in an envelope adhered to the top of one of the shipment’s containers, and include the following information:

- 1) Supplier Name
- 2) Packing Sheet Number
- 3) Total Number of Containers
- 4) Purchase Order Number(s)
- 5) Quantities and UOM per part number (supplier and/or VO)
- 6) Total Number of Containers
- 1) SDS Number (if hazardous material)
- 2) Weight

4.3.5 Heavy Packages

If the package weighs between 50 and 100 pounds, the supplier shall apply two (2) person lift labels on all four sides and the top. If the package weighs more than 100 pounds, the supplier shall provide the package on a skid to allow for handling with devices with forks. In addition, the container shall be marked appropriately if it requires specialized handling, protection, caging and loading techniques and devices.

4.3.6 Supplier Transport Notification

If any of the following conditions exist, the supplier shall notify Shipping and Receiving by calling **(800) 674-3153** no less than three (3) business days prior to pending arrival. The supplier shall record a voicemail, which notifies the internal VO team of pending arrival. If the toll free number experiences technical difficulties, please email: shipping@virginorbit.com.

- 1) Product contains explosive material
- 2) The material requires special equipment or handling, shipping, or storage
- 3) The product weighs more than 1,000 pounds (909 kg)
- 4) Contains three or more pallets

If any of the following conditions exist, the supplier shall contact the Buyer’s purchasing agent for approval, prior to shipping:

- 1) Any dimension is greater than 12 feet in length
- 2) Weight is greater than 10,000 pounds
- 3) Item requires temperature, pressure, shock, or vibration isolation in containers and fixtures
- 4) Unusual and/or abnormal Item configuration

4.3.7 All Product, Except Gas

The supplier shall apply a minimum of two labels, 4” wide by 3” high to all containers on adjacent sides. If the container is fiberboard, the labels applied directly to it. Labels contain the following information:

- 3) Supplier Name
- 4) Supplier Part Number and Revision Level (if applicable)
- 5) Buyer Part Number and Revision Level (if applicable)
- 6) Purchase Order Number

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- 7) VO Work Order Number (if applicable)
- 8) Purchase Order Number Line Number
- 9) Line Item Quantity in shipment
- 10) Line Item Unit of Measure
- 11) Serial Number
- 12) Lot/Batch Number
- 13) Date of Manufacture
- 14) Packing Sheet Number
- 15) Total number of containers
- 16) Container X, of Y (if applicable)
- 17) SDS Number (if hazardous material)
- 18) Weight

If the information is not applicable, the field shall show “N/A”. In addition, label elements shall appear in the order shown above.

4.3.8 Warning Labels - Hazardous and Dangerous Materials

For any materials designated as being hazardous or dangerous, the supplier shall apply ANSI/ISO standard warning labels on at least two sides in accordance with the hazard (combustible, flammable, inhalation hazard, toxic, poison, corrosive, explosive).

4.3.9 Electrostatic Discharge (ESD) Sensitive Items

For product that is ESD sensitive, the supplier shall apply ESD labels that meet MIL-STD-129 requirements on all containers:

- 1) 2”x2” labels on interior containers, on two adjacent sides
- 2) 4”x4” labels on exterior containers, on two adjacent sides

4.3.10 Special Labels or Markings

The supplier shall apply special labels or markings to the shipping containers in accordance with the Buyer’s request. Special labels or markings may include “expedited material”, “new revision”, “material for test”, or other indications.

4.4 Packaging Material Types – SPRC 4.4

4.4.1 Frozen Composite Material – Prepreg Carbon Fiber and Associated Adhesives

The supplier shall ensure that the material remains at the specified temperature from their facility to the Buyer by shipping the product in certified vehicles, or packaging the material in dry ice. In addition, the supplier shall include temperature recorders with electronic data collection that can be downloaded upon receipt. The supplier shall include at least one recorder for every five containers of material.

4.4.2 Composite Parts

The supplier shall pack the product so as to prevent it from surface damage, bending, cracking, breaking, or delaminating. It shall also ensure that none of the sharp edges can tear through the surface of the container.

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4.4.3 Electrostatic Discharge (ESD) Sensitive Material

The supplier shall package ESD sensitive electronics to protect it from static electricity during shipment and storage. Each part shall be individually packed. The supplier shall cover external connectors with conductive caps. The caps shall have a maximum surface resistivity of 10E5 OHMS per square. See the Electrostatic Discharge Association website (www.esda.org) for details.

4.4.4 Oil / Rust Inhibitor Saturated Product

The supplier shall hermetically seal small oil saturated parts in a barrier bag that will contain the oil. For larger parts, the supplier shall ship the parts in wood boxes to prevent container saturation and degradation.

4.4.5 Items with Shelf Life Limitations

The supplier shall clearly identify the delivery limitations, special handling and storage, and specialized equipment requirements for items with shelf life limitations on their containers. Markings shall include the date of manufacture, and the date of expiration. The supplier shall notify the Buyer's Materials department prior to a shipment where precautionary measures are required. If the material requires special storage (such as "keep frozen"), the supplier shall apply at least two ANSI/ISO standard labels on adjacent sides on each container indicating it.

4.4.6 Magnetic Items

The supplier shall mark the packaging for magnetic items that identify them as being magnetic. The markings shall indicate the magnetic field strength of the unpackaged component in milligauss, at a fifteen-foot distance.

4.4.6.1 Products Containing Cadmium

Supplier shall label containers for cadmium, cadmium compounds, cadmium containing materials or articles (such as cadmium plated mechanical fasteners) that are capable of releasing cadmium during the Buyer's manufacturing processes as required by the Occupational Safety & Health Administration regulations found in 29CFR1910.1027 Cadmium Hazard Awareness. As a minimum, these warning labels shall include the following information: Danger, Contains Cadmium, Cancer Hazard, Avoid Creating Dust, Can Cause Lung and Kidney Disease.

4.4.7 Buyer Procured Tooling

Supplier shall clearly mark all shipping containers with instructions for freight forwarding and receiving parties to preserve the integrity of the tools and container by stenciling the following three (3) statements on all four (4) sides and top of the shipping container with the same size lettering:

- 1) "NOT FOR OUTSIDE STORAGE"
- 2) "CONTAINER MUST BE COVERED AT ALL TIMES DURING SHIPPING"
- 3) "CONTAINER IS NOT WATER TIGHT"

5 Reference Documents

- ASTM D3951-15 Standard Practice for Commercial Packaging
- ASTM D5118-15 Standard Practice for Fabrication of Fiberboard Shipping Boxes
- ASTM D6880-11 Standard Specification for Wood Boxes

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- ASTM D6039-11 Standard Specification for Open and Covered Wood Crates
- United Nation's Recommendation on the Transport of Dangerous Goods
- International Air Transport Association's Dangerous Goods Regulations (IATA)
- International Maritime Organization's International Maritime Dangerous Goods Code (IMDG)
- International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO)
- Code of Federal Regulations Title 49 – Transportation
- ASTM D5445-15 Standard Practice for Pictorial Markings for Handling of Goods
- MIL-STD-129 Military Marking for Shipment and Storage
- 29CFR1910.1027 Cadmium Hazard Awareness