

☒ **POLICY** ☐ **PROCEDURE** ☐ **WORK INSTRUCTION**

1.0 Purpose:

The purpose of this Global Supplier Packaging Standards and Requirements Manual is to comprehensively document and communicate ODL packaging requirements to its global supply base.

2.0 Scope:

This policy-level manual of packaging requirements applies to all direct (Tier 1) as well as quality-relevant indirect (Tier 2) suppliers of materials, components, and assemblies to ODL and its affiliates.

3.0 Definitions & Acronyms:

- **BOL- Bill of Lading.**
- **ISPM15 – International Standards for Phytosanitary Measures**
- **TSCA Title VI – Toxic Substances Control Act – U.S. EPA regulation (effective May 22, 2017) regarding Formaldehyde Emission Standards for Composite Wood Products**
- **DMR – Discrepant Material Report**
- **SSOW – ODL Supplier Statement of Work (FPUR-006)**
- **IPPC – International Plant Protection Convention**

4.0 Responsibilities:

- 4.1 The ODL Supplier is responsible for:
 - a. Adhering to the process for packaging selection outline in this document.
 - b. Submission of Packaging Plan on the ODL Packaging Data Form (FSCM-001).
- 4.2 The ODL Buyer is responsible for:
 - a. Ensuring that all active suppliers understand these Packaging Standards & Requirements and are capable of adhering to them.
 - b. Enforcing the Packaging Standards & Requirements if the Supplier is not complying with them.
- 4.3 The ODL Packaging Engineer is responsible for:
 - a. Reviewing the Packaging Proposal represented by the completed ODL Packaging Data Form submitted by suppliers.
 - b. Working with suppliers on modifications to their packaging plan, until compliant with the standards and requirements.

5.0 Policy:

5.1 General ODL Global Packaging Guidelines

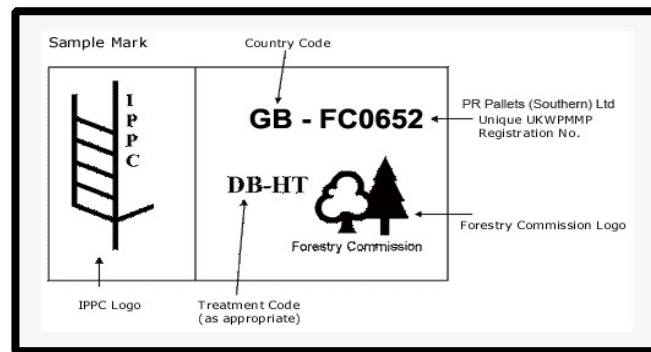
- a. **Introduction** – Packaging is required to:
 - ❖ Protect items from dust, dirt, abrasion
 - ❖ Protect items from all reasonable hazards during shipping (handling and storage, shock, vibration, compression, moisture)
 - ❖ Permit safe and efficient handling, shipping, and storage
 - ❖ **NOTE:** Line-side space for material presentation at ODL assembly facilities is minimal. If parts fit in totes/cartons, parts must ship in small totes/cartons.

b. **Packaging Labeling Requirements**

- ❖ Refer to the ODL Supplier Manual (**POCOR-001**) Section **11.5 Product Labeling** for component label details.

c. **Solid Wood Packaging Materials Compliant to ISPM15**

- ❖ All wooden pallets and wood packaging must conform to International Shipping Standards, government and local transportation rules and regulations.
- ❖ ODL's standard is non-solid wood material to be used for international shipments.
- ❖ Preferred Materials: Plywood, fiber board, or plastic instead of solid wood
- ❖ Solid wood must be treated and marked using the International Plant Protection Convention's (IPPC) "Guidelines for Regulating Wood Packaging Material in International Trade" (**International Standards for Phytosanitary Measures ISPM 15**).



- ❖ Formaldehyde use is common in the adhesives for engineered wood products industry and is a known human carcinogen. It is the responsibility of the supplier to ensure that all engineered wood used in shipping and packaging materials (pallets, crates, etc.) meet the emission regulations for the receiving ODL facility.
 - See Emission Limits chart in **Appendix A** from TSCA Title VI from the EPA.
- ❖ Failure to comply with Government Regulations may have adverse liabilities. Any associated costs and/or fines incurred as a result will be the supplier's responsibility.

d. **Export Expendable Packaging standards for Overseas Shipments**

- ❖ International transportation modes utilize sea-container methods of transport.
- ❖ ODL's most commonly used mode of export shipping utilizes a 40' standard ocean container.
- ❖ Packaging design specifications have been developed to standardize container dimensions and optimize cube efficiency in transportation.

e. **Standard Export Cartons**

- ❖ Design and usage type of corrugated packaging material needs to be evaluated based on the method of transportation and handling through to the point of use.
- ❖ All expendable containers must be filled to maximize container density of 95% to maintain cubic fill and packaging integrity during handling, as well as optimized cubic freight.

f. **Export Pallets**

- ❖ All wooden pallets shipped must have flush stringer design and be assembled using cross ties. Full perimeter pallets are acceptable. Single and double wing pallets are not allowed.
- ❖ All wooden pallets must be able to support a minimum of 2000 lb. (907 kg) internal load capacity.
- ❖ All wooden pallets and wood packaging must conform to International Shipping Standards, government and local transportation rules and regulations.

g. **Corrosion Prevention**

- ❖ It is the responsibility of the supplier to properly protect parts susceptible to corrosion.

5.2 **North American Specific Packaging Guidelines**

a. **Introduction**

- ❖ This section covers guidance for all shipments to ODL North America Sites.
- ❖ All guidelines covered in section **5.1 General ODL Global Packaging Guidelines** apply to North America.
- ❖ Questions related to the below section Packaging Standards can be emailed to the following address: Packaging@odl.com
- ❖ After the full Global Supplier Packaging Standards & Requirements has been reviewed, please use the Packaging Checklist (**Appendix B**) as a guide during packaging development and implementation for ODL North America.

- **NOTE: If packaging is found to be out of compliance without written acceptance from ODL Packaging, a DMR may be issued.**

b. ODL directed suppliers should quote expendable and returnable packaging options per the **ODL Supplier Statement of Work (SSOW) [FPUR-006]**.

- ❖ Provide a detailed breakdown of packaging cost.
- ❖ Provide packaging engineering assumptions on a Packaging Data Form during quote (excel version) and submit with the ODL quote package.

c. Returnable containers should be considered wherever possible. Expendable containers will be accepted ONLY under the following circumstances or directed in the SSOW.

- ❖ Fastener Shipments
- ❖ Overseas Shipments
- ❖ Low volume component scenarios
- ❖ Total landed cost business evaluations
- ❖ ODL and Supplier agree to use expendable containers
- ❖ Supply Chain Disruptions (***must have written approval from receiving plant and mirror returnable packaging: size/density***)

d. Suppliers have the responsibility of ensuring part-quality and maintain packaging for life of contract.

- e. All efforts to meet packaging deadlines, including those for proposal submission, trial packs, packaging procurement, etc., must be made. If a deadline cannot be met, it is the supplier's responsibility to notify the appropriate ODL packaging engineer **at least one week** prior to the deadline date.
- f. Post Launch requests for packaging piece price increases must be submitted to both the ODL Purchasing representative and Packaging Engineer. Include original submitted Packaging Data Form detail with proposed packaging changes on an updated Packaging Data Form with reason/information/data for the packaging change.
- g. The gross weight limit for any expendable or returnable hand-held package (ex: tote, carton, etc.):
 - ❖ U.S and Canada: 30 lbs. (13.6 kg) max.
 - ❖ Mexico: 22 lbs. (10 kg) max. – reference **Appendix C** for regulation
 - ❖ If an ODL Health and Safety/Ergonomics representative deems hand-held packages unsafe based on factors such as height and reach, suppliers may be asked to reduce the gross weight to less than the above standards
- h. A test shipment may be requested for new parts, changes to existing part, packaging, or shipping method, or for ongoing quality maintenance following testing parameters of ASTM D4169 Standard Practice for Performance Testing of Shipping Containers and Systems.
- i. All packaging must be designed to withstand all environmental conditions that shipments in the known supply chain are reasonably expected to experience.

5.3 Packaging Approval Process

- a. Prior to the launch of any new product or product refresh (ODL Launch Phase: Design Verification stage typical 10-12 months prior to SOP):
 - ❖ Suppliers will submit packaging proposal via e-mail using the **ODL Packaging Data Form (See Appendix D)**. The form is available on the **ODL Supplier web page: <https://www.odl.com/suppliers>**
- b. Any pre-production build events should be shipped in production intent packaging representing the packaging proposal during the packaging approval process.
- c. The ODL representative will review the packaging proposal to ensure that its contents are within ODL's best practice standards for packaging.
- d. An ODL representative or ODL Packaging Engineer will notify the supplier whether the proposal is accepted, rejected, or if a packaging trial is being requested. If a trial is requested, the ODL representative will further notify the supplier of the requirements, including quantity, dates, labeling info, etc.
- e. The approved packaging proposal will be located in the **ODL Packaging Data Form** when final approval is granted. (Normally 3-4 months prior to launch).

5.4 Returnable Containers

- a. All containers must be used in compliance to the container manufactures published container weight capacity and dynamic stacking limits.
- b. Returnable packaging should be designed to withstand normal handling throughout the life of the program.

- c. ODL will provide the returnable container fleet or funds to purchase the approved container fleet unless otherwise specified by ODL Purchasing Representative.
- d. ODL will provide a reasonable number of inventory days for suppliers to manage supplier operations.
 - ❖ Standard Levels:
 - Injection molded/Stamping components: 7 days
 - Assembled (Plastic/Metals) components: 3 to 5 days.
 - Any additional requirements are the responsibility of the supplier or written approval from ODL Purchasing and Packaging Engineering is required.
- e. Suppliers must always know the location of returnable containers.
- f. It is expected that ODL owned container assets and dunnage will be maintained and cleaned by the supplier to ensure part quality expectations.
- g. It is the supplier's responsibility to account for cleaning/maintenance costs in the packaging piece price.
- h. Exceptions should be noted in the Supplier Statement of Work (SSOW).
- i. ODL owned container assets that require repair or replacement, supplier will contact ODL Plant Representative for disposition/direction.
- j. Suppliers must ensure that packaging materials in need of repair are set aside in a clearly marked area of their facility and repaired/disposition in two weeks or less.
- k. Prior to each shipment, suppliers should ensure that returnable containers are clear of debris, in good-working order, and old barcode labels are removed.
- l. Each returnable container will have 2-part label locations, a minimum of 2 identification labels, and 2 ODL RFID tags. If unique containers/dunnage the containers will be identified with supplier return to labels.

5.5 Non-Standard Returnable Containers

- a. Racks should only be used when all other packaging forms – totes, bulk bins, etc. – have been exhausted, (i.e., not feasible for the application).
- b. Rack fleets should only be purchased from reputable suppliers and coordinated with ODL Packaging Engineer and Purchasing representative.
- c. Bins/racks should be designed to not only best suit the part, but to also best utilize the inside dimensions of a standard N.A. trailer (636" x 96" x 110").
- d. Bins/racks should be powder-coated the vendor's standard color (blue, black, grey, or beige), unless otherwise specified by the receiving ODL Facility.
- e. Potential pinch point areas should be painted red.
- f. Racks must be stenciled in accordance with the ODL container marking standard.

5.6 Supplier Expectations using ODL provided returnable container assets

- a. Suppliers will return ODL owned container assets within the expected number of days.

- b. Suppliers will utilize ODL owned returnable container assets for the intended production use only. Assets may not be used for storage production parts, work in progress, scrap, or salvaged parts.
- c. ODL will execute a supplier DMR to initiate a chargeback for not returning ODL container assets utilizing the ODL RFID Returnable container tracking system.

5.7 Internal Dunnage

- a. Dunnage (or interior separators of various designs) should be used for additional part protection when required.
- b. When required, internal dunnage should consist of the most inexpensive materials to adequately protect the part.
- c. Dunnage should be as simple & inexpensive as possible and allow for easy access to the parts.
- d. Dunnage should be designed from recycled and/or recyclable materials.
- e. Dunnage in totes/racks should be returnable & semi-permanently attached to the container with Velcro™.
- f. Returnable dunnage in bulk-bins/coffin boxes is preferred, however must be made to knock-down to maximize freight usage. Expendable dunnage costs vs. freight costs should be analyzed if returnable dunnage is not feasible.
- g. Returnable dunnage will be RFID tag to ODL standards and serialized.

5.8 Domestic Expendable Packaging

- a. Expendable container sizes must closely resemble the approved returnable container sizes.
- b. Primary carton direction is half slotted cartons (HSC) with **1 lid per layer** and regular-slotted cartons (RSC) with a perforated tear off lid.
 - ❖ RSC is standard for cartons with its longest dimension less than 24 inches.
 - ❖ HSC is standard for cartons with its longest dimension greater than or equal to 24 inches.
- c. Boxes may be single, double, or triple wall, depending on size & weight requirements.
- d. Boxes must be adhered with tape. Metal staples are not acceptable.

5.9 General Pallet Guidelines – Returnable & Expendable

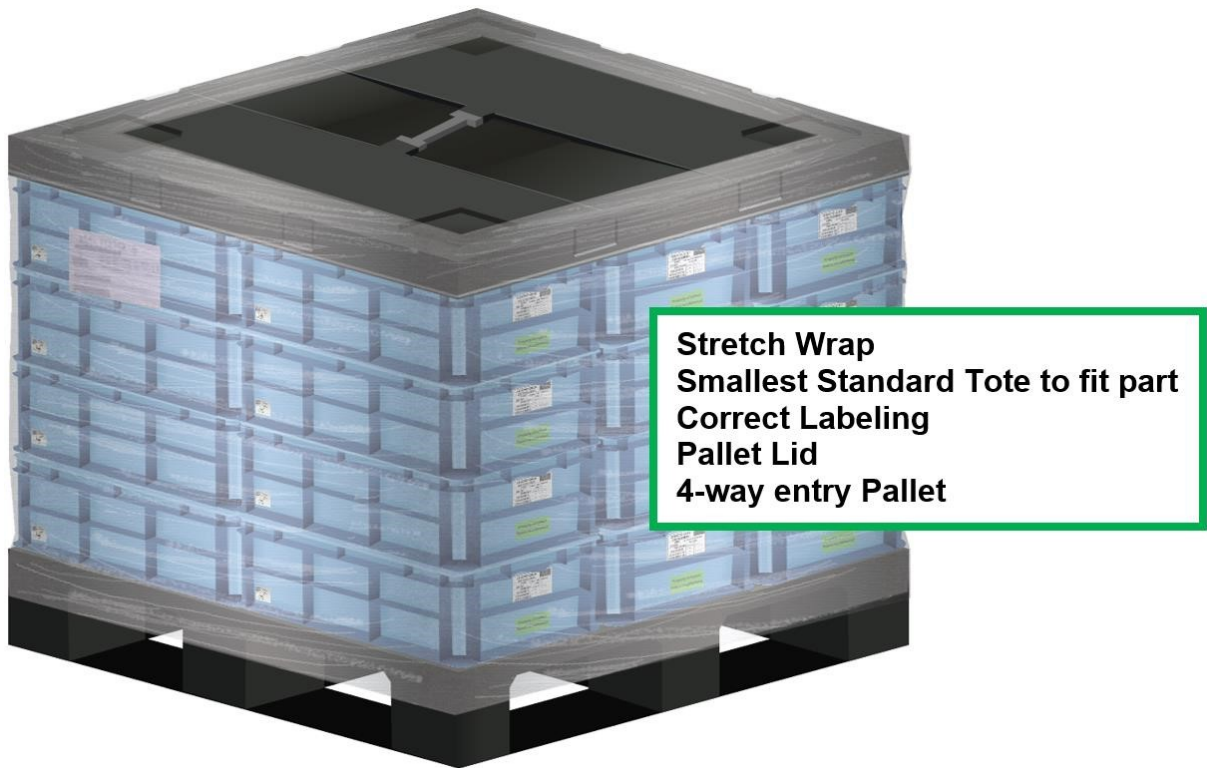
- a. Pallet stack height may not exceed 52".
- b. All unitized pallet loads must be made to safely double, triple, or quadruple stack in a truck, up to 106".
- c. It is not permissible, under any circumstance, for suppliers to ship unitized loads that do not stack.
- d. All pallets must have 4-way entry.
- e. Returnable totes should ship on returnable pallets; expendable totes should ship on expendable pallets.
- f. Returnable Pallets must be able to support a minimum of 4,000 lbs.



- g. When a returnable pallet is used, a returnable top cap must be used to ensure part integrity & stacking stability.
- h. Expendable pallets should be made of durable materials so as not to cause a safety hazard while being handled.
- i. ODL's standard is non-solid wood material to be used for international shipments.
- j. Each pallet should contain only one part number worth of parts; do not mix skids unless otherwise directed/approved to do so by the receiving ODL Facility.
- k. Containers must not hang over the edges of the pallet.
- l. Containers must be secured to the pallets when shipped – NO EXCEPTIONS.
- m. ODL Best Practice is 4-way banding (two bands in each direction, length and width) and stretch wrapping (see **Section 5.10 Packaging Best Practices**).
- n. Several rotations around the base of the pallet with stretch wrap are required to fasten load to the pallet.
- o. All banding must be plastic; metal banding is strictly prohibited (unless written authorization is obtained from ODL).
- p. Banding should be 4-way for proper securement.
- q. Seat belts are also acceptable.
- r. It is the supplier's responsibility to secure all unit loads with adequate banding.

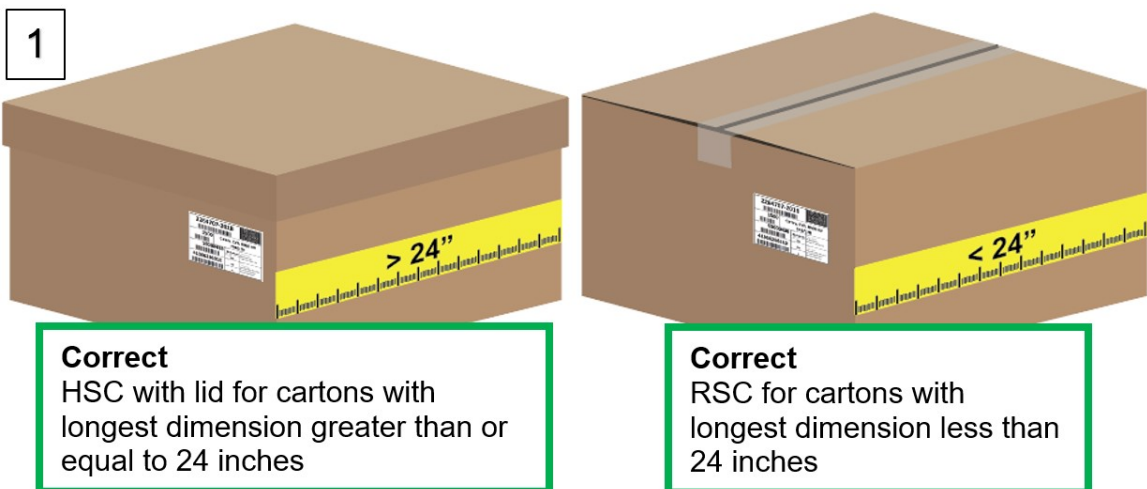
5.10 Packaging Best Practices

a. Returnable Unit Load

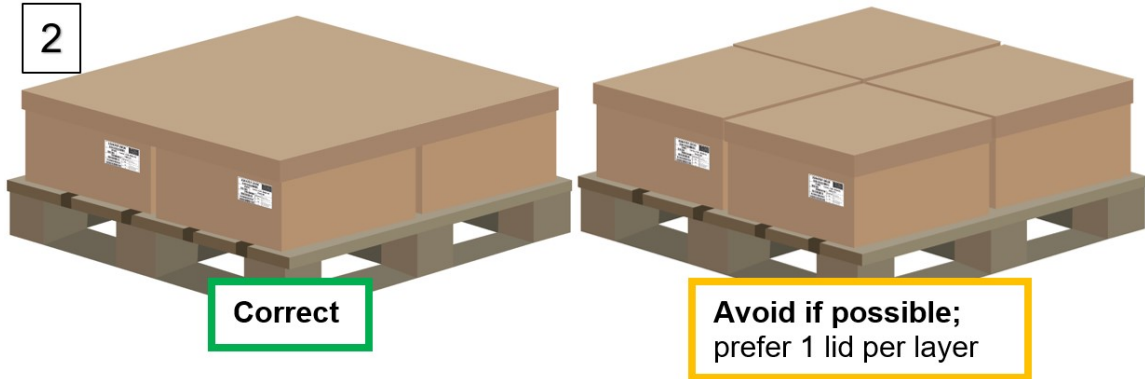


b. Expendable Unit Load:

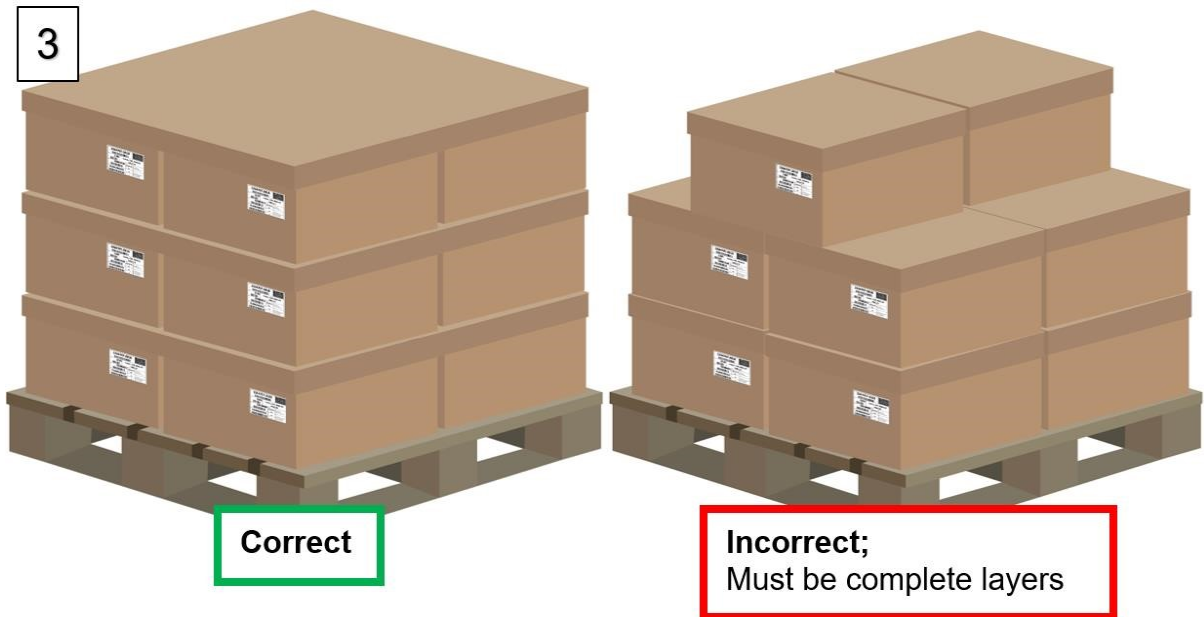
- ❖ Select a carton style base on the longest dimension:



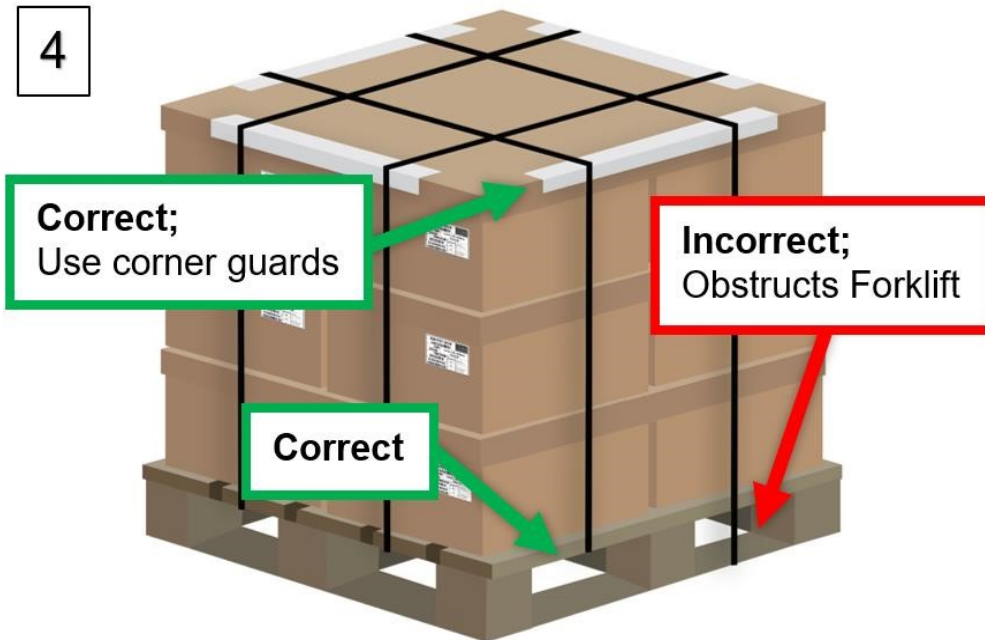
- ❖ Optimize lids by having one lid per layer instead of one lid per box:



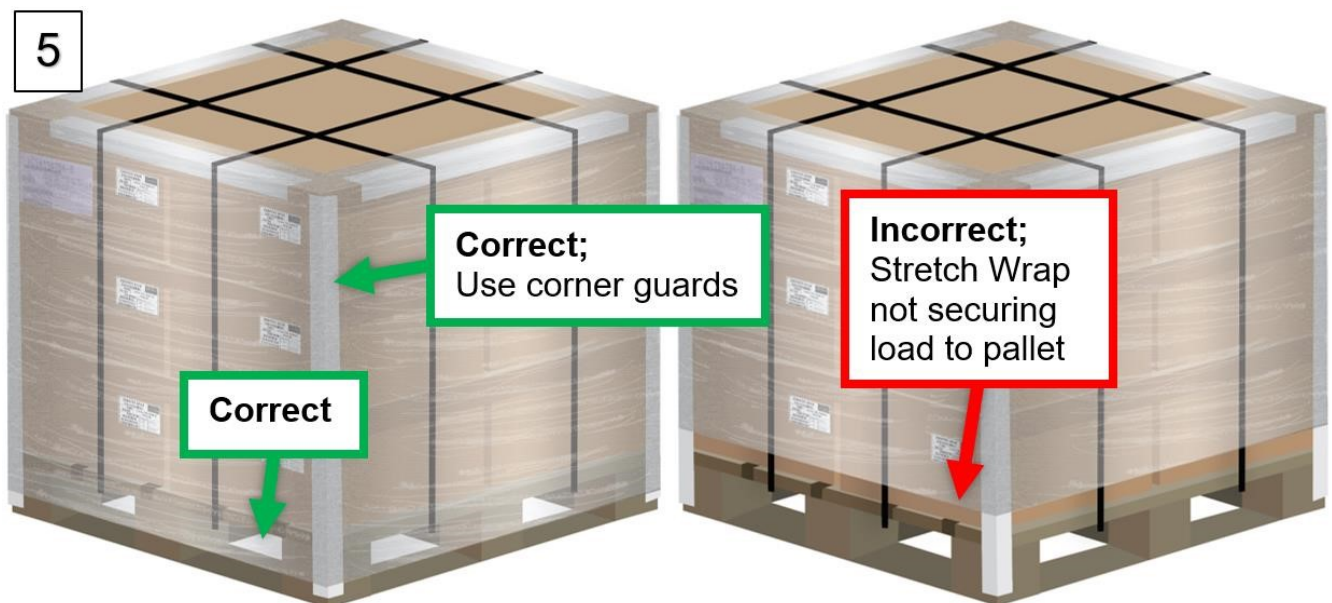
- ❖ Build pallets with even layers:



- ❖ Band pallets through openings with plastic banding:



- ❖ Stretch-wrap pallet with several rotations around the base of the pallet:



6.0 Forms, Records, Procedures & Work Instructions Referenced

- 6.1 FSCM-001 ODL Packaging Data Form
- 6.2 POCOR-001 ODL Supplier Manual
- 6.3 FPUR-006 ODL Supplier Statement of Work

7.0 Departments

- 7.1 ODL Corporate Supply Chain
- 7.2 ODL Corporate Purchasing
- 7.3 ODL Manufacturing Engineering

8.0 APPENDICES

Appendix A: EPA's TSCA Title VI Formaldehyde Emission Limits

Product	Emission Standard
Hardwood Plywood – Veneer Core	0.05 ppm of formaldehyde
Hardwood Plywood – Composite Core	0.05 ppm of formaldehyde
Medium-Density Fiberboard	0.11 ppm of formaldehyde
Thin Medium-Density Fiberboard	0.13 ppm of formaldehyde
Particleboard	0.09 ppm of formaldehyde

Appendix B: Packaging Checklist

1. ☐ The latest version of the ODL Supplier Manual and ODL Supplier Packaging Standards and Requirements has been read and understood
2. ☐ Packaging was selected based on ODL Best Practices and ODL Standards, selecting the smallest container that fits the part
3. ☐ For all international shipments, wood materials used in packaging (pallets, crates, etc.) shall be non-solid, manufactured wood or plastic
4. ☐ Containers that are intended to be hand-held are a maximum of 22 pounds for Mexico and 30 pounds for US and Canada
5. ☐ Returnable containers were selected for use or shipment meets the acceptable circumstances for expendable containers
6. ☐ Containers and container materials were selected with sufficient strength and properties to contain the product through the entire supply chain for each part
7. ☐ Internal dunnage is identified if required for additional part protection
8. ☐ Pallet footprint meets ODL Standards, has 4-way entry, and has even layers with no container overhang.
9. ☐ Load is properly secured with stretch wrap and/or plastic banding and stacks up to 106"
10. ☐ Packaging Proposal was submitted on ODL Packaging Data Form and any concerns raised during the ODL review have been addressed for each part number supplied to ODL.

Appendix C: NORMA Official Mexican NOM-006-STPS-2014

NORMA Oficial Mexicana NOM-006-STPS-2014,
 Manejo y almacenamiento de materiales-
 Condiciones de seguridad y salud en el trabajo.

- ✓ Verifica que la carga manual máxima que manejan los trabajadores no rebasa:
- o 25 kg para hombres;
 - o 10 kg tratándose de mujeres, y
 - o 7 kg en el caso de menores de 14 a 16 años;

NORMA Official Mexican NOM-006-STPS-2014,
 Material handling and storage-Conditions of
 security and health at work.

- ✓ Verify that the maximum manual load that the workers do not exceed:
- o 25 kg (55.1 lb) for men;
 - o 10 kg (22 lb) for women, and
 - o 7 kg (15.4 lb) in the case of children under 14 to 16 years



Appendix D: ODL Packaging Data Form

ODL PACKAGING DATA FORM (PDF)									
*** FIELDS HIGHLIGHTED IN GRAY ARE MANDATORY; data MUST be entered into gray fields prior to submission or pdf will be returned to supplier.									
Proposal: Concept/quote: 1A		Prototype: 1B		Production: 1C		Rev Level: 1D			
Product line: 1E		Supplier Name: 1F				Date Revised: 1G			
Product Group: 1H		Supplier Plant Location: 1I							
Start of Production Date: 1J		Supplier Contact: 1K							
Component Annual Volume: 1L		Phone: 1M							
Component Daily Volume: 1N		Fax: 1O							
ODL Plant Location: 1P		E-mail: 1Q							
PART INFORMATION									
ODL Part No.'s: 2A		Supplier Part #'s: 2B		ODL Supplier / Part Name or Description: 2C		Tool #: 2D		Part Dimensions: Length (in.): 2E Width (in.): 2F Height (in.): 2G	
PRIMARY CONTAINER									
Expendable or Returnable: 3A		Length (in.): 3B		Width (in.): 3C		Height (in.): 3D		Returnable System Days Assumptions	
Container Model: 3E		O.D. 3F		I.D. 3G		Tare Weight: 3H (lbs.)		Supplier inventory days: 4A	
Container Type: 3I		Gross Weight: 3J (lbs.)		(parts + packaging)		Container # 3K		ODL inventory days: 4B	
Color: 3L								In-transit to customer days: 4C	
Container Supplier: 3M								In-transit from customer days: 4D	
Parts/Container: 3N								Border Crossing/Consolidation: 4E	
PRIMARY INTERNAL DUNNAGE									
Dunnage Expendable or Returnable: 5A		Dunnage Description: 5B		include qty/container		Dunnage Supplier: 5C		Total System Days: 4F	
								Shipping Frequency: 4G	
								Total Containers in System: #VALUE!	
								Total Pallet Sets in System: #VALUE!	
								Return Ratio: 4I to 1	
PALLET INFORMATION									
Pallet expendable or returnable: 6A		Total Parts/Pallet: #VALUE!		Days on hand of One pallet: #VALUE!		BACKUP EXPENDABLE INFORMATION			
Containers/layer: 6B		Pallet Loads/Trailer Layer: 6C		Pallet Loads/Trailer: 6D		Carton Description/Part #: 7A			
Layers of containers/pallet: 6E		Pallet Loads/Trailer: 6F		Pallet Loads/Trailer: 6G		Dunnage Description/Part #: 7B			
Total containers/pallet load: #VALUE!		Pallet Loads/Trailer: 6H		Pallet Loads/Trailer: 6I		Pallet Description/Part #: 7C			
Pallet #: 6J		Length (in.): 6K		Width (in.): 6L		Height (in.): 6M		Expendable Supplier: 7D	
Overall unit load dimensions: 6N		Pallet Model #: 6O		Pallet Type and Description: 6P		Lid Model #: 6Q		Expendable PO/Quote #: 7E	
Pallet Model #: 6R		Lid Type and Description: 6S		Unit load banding method: 6T		Additional Information: 7F			
CONTAINER/PALLET IDENTIFICATION (specify: hot stamp, stenciling, ID tag)									
Totes/Bulk Container ID Info: 8A		Verbage: 8B		Location: 8C		Additional Label Info: 8D		Color: 8E	
Sequential #: 8F		Barcode Label Holder: 8G		Plastic holder or Kennedy Placard		CONTAINER LOADING INSTRUCTIONS			
						Provide Detail on Loading/Unloading: 9A			
DRAWING / PICTURE OF PARTS AND PACK									
10A		10B				CONTAINER CLEANING & MAINTENANCE			
						Ownership Resp. 11A			
						Amount Assumption: 11B			
						Frequency: 11C			
						Repair/Replacement Rates: 11D			
						Cleaning instructions and comments: 11E			
PACKAGING APPROVAL									
Supplier Packaging Engineer:		Supplier Quality Contact:		Supplier Materials Contact:					
sign_date.print		sign_date.print		sign_date.print					
ODL Packaging Engineer:		ODL Quality Contact:		ODL Materials Contact:					
sign_date.print		sign_date.print		sign_date.print					
ODL Manufacturing Contact:		Other approval contacts:							
sign_date.print		sign_date.print							
Packaging requirements are detailed in ODL Supplier Standards Manual (Supply Chain management Expectations/Packaging Requirements).									
All suppliers are required to have an expendable packaging back up plan per Supplier Standards Manual.									
Form level: Rev-1 (March 2019)									

9.0 Document Revision History

<i>Rev. Level</i>	<i>Rev Date</i>	<i>Author</i>	<i>Dir. / Mgr. Approval</i>	<i>Reason for update</i>	<i>Doc. Control Approval</i>
IR**	01-27-2021	Mike Gale	Kris Busman Jon Karel James Zhang	Initial Release	Todd Schauder

**** NOTE:** This document is posted on the ODL supplier web page at <https://www.odl.com/suppliers> and any future revisions must be updated there as soon as it is issued.