

FEDA Shipping, Packaging, and Handling Standard

Best Practice Standards for Reducing Freight Damage in the Commercial Foodservice Equipment Industry

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Disclaimer

This publication establishes recommended best practices developed through industry collaboration. It is intended to provide guidance to manufacturers, distributors, carriers, and other supply chain participants within the commercial foodservice equipment industry.

These standards do not create legal obligations and are not intended to supersede applicable laws, regulations, carrier tariffs, contractual agreements, or the National Motor Freight Classification® (NMFC®). Organizations are responsible for determining the applicability of these recommendations for their operations.

Forward

This publication was developed by the Foodservice Equipment Distributors Association (FEDA) through the Shipping, Packaging, and Handling Standards (SPHS) Initiative, a subcommittee of FEDA's Future of Distribution Council (FDC).

The Future of Distribution Council was established to provide distributors, manufacturers, and industry partners with a collaborative forum to identify emerging opportunities, address critical industry challenges, and develop initiatives that strengthen the long-term success of the commercial foodservice equipment and supplies distribution industry. As part of this mission, the SPHS Initiative was formed to address one of the industry's most persistent operational challenges—freight damage.

The SPHS Initiative brings together distributors, manufacturers, transportation providers, and other industry stakeholders to develop practical, consensus-based best practices that improve packaging, handling, transportation, and receiving processes throughout the commercial foodservice equipment supply chain. The recommendations contained in this publication were developed through industry collaboration, operational experience, analysis of freight damage trends, and review of current transportation and packaging practices.

These standards are intended to complement applicable laws, regulations, carrier tariffs, contractual agreements, and the National Motor Freight Classification® (NMFC®). They establish recommended practices that organizations may adopt to improve product protection, reduce freight damage, strengthen communication among supply chain partners, and promote greater consistency throughout the industry.

FEDA recognizes that transportation practices, packaging technologies, and distribution methods continue to evolve. Accordingly, these standards are intended to be living documents that will be reviewed and updated periodically to reflect new technologies, operational experience, and industry feedback. FEDA encourages continued participation from manufacturers, distributors, carriers, and other stakeholders to support future revisions and ongoing improvement of these best practices.

1. Purpose

The purpose of this standard is to establish a common framework of recommended best practices for the packaging, handling, transportation, and receipt of commercial foodservice equipment and related products. The recommendations contained in this standard are intended to reduce freight damage, improve product protection, promote consistency across the supply chain, support more efficient transportation and distribution operations, and enhance the end-customer experience by increasing the likelihood that products arrive complete, undamaged, and ready for installation or use.

This standard provides practical guidance for distributors, manufacturers, and transportation providers by identifying industry-recognized practices that improve communication, handling, inspection, and packaging performance throughout the distribution process. Adoption of these best practices is intended to encourage continuous improvement while recognizing the diverse operational environments and business practices within the commercial foodservice equipment industry.

2. Scope

This standard provides recommended best practices for the preparation, packaging, handling, transportation, and receipt of palletized, crated, and packaged commercial foodservice equipment and related products transported through Less-than-Truckload (LTL), Full Truckload (FTL), and other freight transportation modes.

The recommendations contained in this standard apply to manufacturers, distributors, third-party logistics providers, motor carriers, and other organizations responsible for preparing, handling, transporting, storing, or receiving freight. The standard addresses practices related to packaging design, palletization, material handling, freight identification, inspection, and damage prevention under normal transportation conditions.

Unless otherwise specified, each technical standard contained in this publication includes recommendations applicable to the following stakeholder groups:

- Distributors
- Manufacturers
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- Less-than-Truckload (LTL) carriers
- Others (such as FTL or other transportation modes)

Organizations are responsible only for the recommendations applicable to their role within the supply chain.

These recommendations are intended to complement applicable laws, regulations, carrier tariffs, contractual agreements, and the National Motor Freight Classification® (NMFC®). Organizations may implement these best practices in whole or in part based on their products, transportation methods, operational capabilities, and business requirements.

3. Normative References

The following referenced document is indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- **National Motor Freight Classification® (NMFC®)**, published by the National Motor Freight Traffic Association, Inc. (NMFTA).

4. Terms and Definitions

Abrasion - Surface wear or damage caused by repeated rubbing or friction between freight, packaging, trailer surfaces, or material handling equipment during transportation.

Blocking - Structural material placed beneath or around a product to distribute weight, prevent movement, or provide additional support during handling and transportation.

Center of Gravity (CG) - The point at which the weight of a load is considered evenly balanced. Center-of-gravity markings assist handlers in lifting and transporting freight safely.

Consolidated Load - Two or more products or shipments combined onto a single pallet, skid, or unitized load for transportation.

Corner Protection - Protective material installed on the edges or corners of a package to reduce damage from banding, compression, abrasion, or incidental contact during handling and transportation.

Cross-Docking - The transfer of freight from one trailer or transportation unit to another with minimal or no long-term storage, typically involving multiple handling events.

Dunnage - Materials used to separate, stabilize, brace, cushion, or protect freight during transportation.

Dynamic Load Capacity - The maximum weight a pallet or skid is designed to support while being lifted or transported by material handling equipment.

Fork Entry - The designated opening or access point through which forklift forks are intended to enter a pallet, skid, or crate.

Fork Pocket - A reinforced opening incorporated into a crate, skid, or packaging system specifically designed to receive forklift forks.

Freight Damage - Physical damage, deformation, cosmetic damage, or functional impairment occurring during handling, storage, loading, unloading, or transportation.

Freight Touch - A single handling event in which freight is lifted, moved, transferred, or repositioned by personnel or material handling equipment.

Full Truckload (FTL) - A freight transportation service in which a trailer is dedicated to a single shipper's shipment and typically experiences fewer handling events throughout the transportation process.

Handling Equipment - Equipment used to move, lift, or position freight, including forklifts, pallet jacks, conveyors, cranes, hoists, and similar devices.

High-Value Freight - Freight having significant financial value or operational importance that warrants enhanced packaging, handling, or security measures.

Inter-Freight Contact - Physical contact between adjacent shipments during transportation or handling that may result in abrasion, impact, compression, or cosmetic damage.

Less-than-Truckload (LTL) - A freight transportation service in which shipments from multiple shippers are consolidated into a single trailer and typically experience multiple handling events throughout the transportation network.

Load Stability - The ability of a palletized or packaged load to maintain its intended configuration throughout handling and transportation without shifting, tipping, collapsing, or becoming unstable.

Mechanical Handling - The use of powered or manual material handling equipment—including forklifts, pallet jacks, conveyors, or similar equipment—to move freight.

Multiple Handling Events - The pickup, transfer, cross-docking, sorting, loading, unloading, and final delivery activities that occur during transportation. LESS-THAN-TRUCKLOAD (LTL) shipments typically experience three to six handling events.

Normal Transportation Conditions - The standard, non-extraordinary conditions encountered during common carrier transportation, including multiple handling events, mechanical handling, cross-docking, trailer loading and unloading, vibration, shock, environmental exposure, and temporary terminal storage.

Overhang - Any condition in which the product, packaging, or unitized load extends beyond the supporting perimeter of the pallet, skid, crate, or packaging system.

Pallet - A portable platform designed to support goods during storage and transportation while allowing mechanical handling.

Pallet Footprint - The outside dimensions of the supporting pallet, skid, or crate that define the intended area for supporting a load.

Point Load - A concentrated load applied to a limited area of a pallet, such as equipment supported by legs, casters, or feet rather than a continuous base.

Repalletization - The process of transferring freight from one pallet or skid to another or rebuilding a palletized load after receipt or consolidation.

Skid - A platform, typically without a bottom deck, designed to support and transport heavy equipment.

Stackability - The capability of packaged freight to safely support additional loads placed above it during storage or transportation.

Static Load Capacity - The maximum weight a pallet or skid can safely support while stationary.

Structural Pallet Integrity - The ability of a pallet or skid to maintain its structural strength and safely support the intended load throughout handling, transportation, and storage without failure. Add Crate, Packaging System?

Unitized Load - One or more products secured together on a pallet or skid to function as a single handling unit. Crate, Packaging System?

Vibration - Repeated motion transmitted through transportation equipment that may contribute to product movement, packaging degradation, or freight damage.

5. Forklift Handling

This standard establishes recommended best practices for reducing freight damage associated with forklift handling during the packaging, loading, unloading, transportation, storage, and delivery of commercial foodservice equipment. The recommendations apply to manufacturers, distributors, and Less-than-Truckload (LTL) carriers responsible for designing packaging, operating material handling equipment, or handling freight throughout the distribution process.

5.1 Manufacturer Recommended Practices

The manufacturer, when acting as the shipper, should ensure that all articles tendered for transportation are prepared, packaged, and documented in a manner suitable for the

normal operation of Less-than-Truckload (LTL), Full Truckload (FTL), and Common Carrier transportation, including multiple handling events and cross-docking.

5.1.1 Fork Entry and Handling Compatibility

- I Packaging should be compatible with commonly used Class I through Class V powered industrial trucks equipped with appropriately rated forks. (Forks and Forklifts may vary greatly between MFG, Distributor, and Carriers)
- II Fork entry way point(s) should be clearly identified with high-visibility markings and, where applicable, marked on the exterior of the package.
- III Forklift forks should provide adequate support to prevent pallet or crate deflection, instability, or damage during lifting.
- IV Forklift forks should provide adequate support for the load and be fully engaged within the designated fork entry points. When fork length exceeds the depth of the load, operators should ensure that fork overhang does not create a hazard or result in damage to adjacent freight, equipment, trailers, docks, or personnel.
- V Material handling equipment should be appropriately selected based on the load's weight, dimensions, center of gravity, packaging configuration, and handling environment.
- VI Equipment should have sufficient rated capacity to safely lift, transport, and place the load without causing damage to the freight or creating a safety hazard.

5.1.2 Packaging and Pallet Integrity

- I Shippers should utilize pallets or crates of sufficient strength and construction to withstand multiple handling events, stacking, and transit vibration.
- II Damaged, weakened, or non-uniform pallets should not be used.
- III Packaging should be appropriate to prevent shifting, compression failure, or exposure during normal Less-than-Truckload (LTL) transport conditions.
- IV Additional protection should be provided on the bottom 1/3 of the package to prevent unintentional damage during forklift handling.
- V Proper pallet sizing with additional height to prevent unintentional fork damage when moving a package.

5.1.3 Handling Risk Mitigation

- I Shippers should design packaging to tolerate incidental contact from material handling equipment.
- II Where product sensitivity requires protective measures (including but not limited to fork protection zones or reinforced areas) should be incorporated.
- III Shippers should label each package with safe handling instructions using high visibility markings which are visible from 10 feet away.

5.1.4 Freight Organization and Cross-Docking Considerations

- I Shipments should be organized, where practicable, to reduce unnecessary handling and cross-docking events. (size, weight, dimensions) into a single or controlled area to avoid unintentional damage from other packages in transit.

- II Freight should be labeled to support efficient identification and routing at intermediate terminals from at least 10' away.

5.1.5 Operational Readiness

- I Shippers should ensure correct material handling equipment is available during loading operations.
- II Loading practices should not prioritize speed over proper securement and handling.

5.1.6 Training and Documentation

- I Shippers should maintain documented packaging standards and handling instructions.
- II All required labeling, including handling instructions, should be clearly visible and compliant with applicable NMFC provisions.
- III All products should have SOPs for the packaging procedures.
- IV Personnel involved in packaging, handling, loading, unloading, and inspection should receive documented training appropriate to their responsibilities

5.1.7 Concealed Damage Communication

- I Shippers should communicate delivery inspection requirements to downstream parties. (methods of communication include email, phone, and attached to package)
- II Where applicable, shippers should notify consignees in advance of delivery and instruct that shipment must be inspected prior to carrier departure.
- III When receiving the freight, the receiver should inspect the freight for damage before signing off on the receipt and the shipper leaves.
- IV Shippers should allow the receiver to sign off and report the damage before leaving the facility.

5.2 Distributor Recommended Practices

The distributor, when acting as an intermediary handler, repackager, or receiver, should maintain compliance with all applicable packaging, handling, and inspection requirements.

5.2.1 Handling Equipment and Practices

- I Distributors should maintain appropriate material handling equipment compatible with the freight received and shipped.
- II Forklift operations should be conducted in a controlled manner to prevent damage due to rushing or improper handling.

5.2.2 Repackaging Standards

- I Any repackaging performed should meet or exceed the original shipper's packaging specifications.
- II Distributors should utilize only pallets and packaging materials suitable for Less-than-Truckload (LTL) transport conditions.

5.2.3 Freight Handling and Organization

- I Distributors should organize freight within the facility to minimize unnecessary handling and rehandling.
- II Cross-docking practices should be managed to reduce excessive transfer points.

5.2.4 Training and Process Compliance

- I Personnel involved in packaging, handling, loading, unloading, and inspection should receive documented training appropriate to their responsibilities.
- II The distributor should ensure documentation supporting compliance with packaging and handling standards.

5.2.5 Inspection and Damage Reporting

- I Distributors should inspect all freight upon receipt and prior to outbound shipment.
- II Visible damage should be documented at the time of receipt or delivery.
- III Distributors should ensure personnel are trained to identify and report concealed damage in accordance with NMFC claims procedures.
- IV The consignee should promptly notify both the carrier and shipper upon discovery of concealed and visible damage.

5.2.6 Consignee Communication

- I Distributors should notify consignees of delivery timing and inspection requirements.
- II Distributors should instruct consignees to inspect shipments prior to signing the delivery receipt and prior to carrier departure.

5.3 Less-than-Truckload (LTL) Carrier Recommended Practices

The carrier should transport and handle freight in accordance with NMFC provisions , recommendations defined within this standard and in a manner consistent with the normal rigors of Less-than-Truckload (LTL) transportation.

5.3.1 Handling Equipment and Compatibility

- I Carrier should utilize material handling equipment appropriate for the freight being handled, including proper fork dimensions and configurations consistent with labeled packaging.
- II Carrier should avoid handling practices that exceed the design limitations of packaging.

5.3.2 Handling Practices

- I Freight should be handled in a manner that minimizes impact, compression, and shifting.
- II Carrier should ensure that handling speed and productivity targets do not compromise safe handling practices.

- III Carrier should implement all packaging handling instructions either on the package or related paperwork to ensure safe handling.
- IV Carrier should identify safe handling procedures.

5.3.3 Freight Movement and Cross-Docking

- I Carrier should manage terminal operations to minimize unnecessary handling and transfer events.
- II Freight should be staged and organized to reduce rehandling and misrouting.

5.3.4 Packaging Condition at Transfer Points

- I Carrier should note and document visible packaging deficiencies or damage at the time of receipt and at transfer points.
- II Freight with compromised packaging may be subject to exception notation in accordance with NMFC rules.

5.3.5 Training and Compliance - Individual Partnership Level Focus

- I Carrier should ensure personnel are trained in handling freight requiring special care, including freight susceptible to damage from improper forklift use.
- II Carrier should ensure training received follows any published manufacturer's recommendations which have been shared with the carrier.

5.3.6 Inspection and Delivery Protocol

- I Carrier should provide the consignee a reasonable opportunity to inspect freight at the time of delivery.
- II Delivery receipts should accurately reflect the condition of freight at the time of delivery when exceptions are observed.
- III For concealed damage, the responsible party, based on the terms of sale, should notify the carrier promptly upon discovery. Unless otherwise specified by the carrier, notice of concealed loss or damage should be provided within five (5) business days after delivery. Formal claims should be filed in accordance with the carrier's claims procedures and within the applicable filing period, generally not more than nine (9) months from the date of delivery.
- IV For freight refused because of damage, the carrier should document the reason for refusal, maintain the shipment in a secure condition, and promptly notify the shipper or other responsible party to determine disposition instructions.
- V For freight that is temporarily lost or cannot be located, the carrier should initiate a trace, communicate shipment status to the responsible party, and provide timely updates until the shipment is located or the investigation is concluded.
- VI For freight determined to be permanently lost, the carrier should promptly notify the responsible party and process the shipment in accordance with applicable claims procedures, carrier tariffs, and the Uniform Straight Bill of Lading.
- VII Carriers should maintain documentation supporting damage, refusal, loss, or recovery events, including photographs (when available), delivery receipts, exception notations, and shipment tracking records to support claims resolution.

6. Pallet Build: Structural Integrity and Load Configuration

This standard establishes recommended best practices for the design, construction, loading, and maintenance of pallets, skids, and unitized loads used to transport commercial foodservice equipment. The recommendations apply to manufacturers, distributors, and Less-than-Truckload (LTL) carriers responsible for building, handling, repalletizing, transporting, or inspecting palletized freight.

6.1 Manufacturer Recommended Practices

6.1.1 *General Requirement – Structural Design and Load Integrity*

- I The manufacturer, when acting as the shipper, should ensure that all pallets and skids are designed, constructed, and loaded to fully support the product, maintain load stability, and withstand the rigors of handling, transportation, and storage under normal operating conditions. Pallet design should align with product weight, dimensions, and center of gravity.
- II Loads should remain stable and intact throughout all handling events, including Less-Than-Truckload (LTL) cross-docking.
- III Maintain a Standard Operating Procedures for each build which is consistent across shipments and avoid using custom non-standard builds

6.1.2 *Pallet Selection and Design Configuration*

- I Pallets and skids should be purpose-designed for the product and should not rely on standard pallet sizes when unsuitable.
- II Pallets should be sized to fully contain and support the product footprint.
- III Standard pallets should not be used when they result in unsupported loads or structural compromise.
- IV Pallet construction should match product requirements, including:
 - a. Weight capacity (dynamic and static ratings)
 - b. Load distribution characteristics.
- V Recycled or structurally compromised pallets shall not be used for heavy or high-value equipment.
- VI Ensure the design and configuration of pallet supports for stacking.

6.1.3 *Four-Way Entry and Handling Accessibility*

- II Pallets should be designed to allow safe and efficient mechanical handling.
- III Four-way entry pallets or skids should be used where feasible and allow for the proper handling of freight, particularly for Less-than-Truckload (LTL) shipments.
- IV Pallets should include bottom deck boards or a perimeter base to:
 - a. Improve stability.
 - b. Reduce fork damage.
- V Fork entry points should be unobstructed and structurally reinforced.

6.1.4 *Load Placement and Weight Distribution*

- I Product placement on the pallet should ensure proper distribution of load and structural support.
- II Weight should be supported at primary load-bearing points (e.g., legs, wheels, or base frame). Items with legs or wheels should be blocked underneath to reduce the weight borne by those components during transit and prevent damage to legs, wheels, or the base frame.
- III Load-bearing points should align with pallet runners, blocks, or reinforced deck areas.
- IV Loads should not rest on unsupported slats or weak deck sections.
- V For point-load equipment, additional support should be provided (e.g., skid runners, plywood decking)

6.1.5 *Assembly of Product on Pallet*

- I Where feasible, products should be assembled and secured directly onto the pallet to minimize handling and repositioning.
- II Final assembly should occur on the pallet or skid whenever possible.
- III Products should not require removal or repositioning prior to shipment.
- IV Assembly methods should enhance load stability and reduce handling risk.

6.1.6 *Product Securing Methods*

- I Products should be securely anchored to the pallet to prevent movement during handling and transit. Acceptable methods include:
 - a. Lag bolts or mechanical fasteners.
 - b. Engineered brackets or blocking
 - c. Strapping systems
 - d. Shrink wrapping or banding (supplemental only)
- II Securing methods should be appropriate for product weight and vibration exposure.
- III Loads should remain secure and should not shift, loosen, or “walk” under vibration.
- IV Fastening systems should not damage the product or compromise structural integrity.

6.1.7 *Structural Reinforcement and Stack Integrity*

- I Palletized loads should be constructed to maintain vertical and lateral integrity under stacking and transport conditions.
- II Corner posts and rigid top caps should be used where stacking strength is required.
- III Loads should maintain vertical sidewalls to support column stacking.
- IV “Pyramid” or tapered load configurations shall not be used.
- V Packaging should resist compression and lateral forces encountered during transit.

6.1.8 Pallet Consolidation and Multi-Item Loads

- I When multiple items are placed on a single pallet, the combined load should maintain structural integrity and stability.
- II Items should be arranged to distribute weight evenly across the pallet.
- III Consolidation should not compromise pallet strength or create instability.
- IV Mixed loads should be secured to prevent shifting or contact damage.

6.1.9 Mode-Specific Requirements (Less-than-Truckload (LTL) vs. Full Truckload (FTL) vs. Container)

- I Pallet build and design should account for transportation mode and associated handling conditions. All freight items should be packaged as if they will move via Less-than-Truckload (LTL) at some point prior to being received at the final destination point.
- II Less-than-Truckload (LTL) Shipments:
 - a. Pallets should be designed for frequent handling and multi-contact environments.
 - b. Enhanced structural integrity and securement should be required.
- III Full Truckload (FTL):
 - a. Pallet design should account for load shift and transport vibration.
 - b. Structural requirements remain, though handling frequency is reduced.
- IV Containerized Shipments:
 - a. Pallets should be designed for extended vibration and compression loads.
 - b. Internal bracing and reinforcement should be required.

6.1.10 Packaging Visibility vs. Protection

- I Packaging design should balance visibility and protection based on product risk profile.
- II Open or visible packaging designs should not compromise product protection.
- III Enclosed or “hidden” packaging should be used where exposure risk is high.
- IV Packaging selection should prioritize protection over visibility when in conflict.

6.1.11 Testing and Validation

- I Pallet and load configurations should be validated through testing where design changes or risk conditions exist.
- II Required Validation:
 - a. Compression Testing – Verify stacking strength.
 - b. Vibration Testing – Confirm load stability under transit conditions.
 - c. Fork-Impact Simulation – Validate handling durability.
- III Testing may align with ASTM International ASTM D4169 or equivalent.

6.1.12 Warehouse Operations and Training

- I Personnel involved in pallet build and handling should be trained to ensure compliance with FEPA standards. Training should include:
 - a. Proper pallet selection and design

- b. Load placement and secure techniques.
 - c. Identification of non-compliant builds
- II Standard operating procedures should include inspection criteria and corrective actions.

6.1.13 Pallet Integrity Inspection (Quick Check Requirement)

- I Manufacturers should perform a pre-shipment inspection of all palletized loads. Minimum inspection criteria include:
 - a. Pallet is structurally sound (no cracks, breaks, or weakness)
 - b. Four-way entry access is functional and unobstructed.
 - c. No protruding nails, fasteners, or sharp edges
 - d. No missing or damaged deck boards
 - e. Load is stable, centered, and fully secured.
- II Non-compliant pallets should be repaired or replaced prior to shipment.

6.2 Distributor Recommended Practices

6.2.1 General Requirement – Preservation and Restoration of Structural Integrity

- I Distributors should preserve the structural integrity of palletized loads and should not introduce conditions that compromise pallet design, load stability, or product protection during handling, storage, consolidation, or repalletization.
- II Distributors handling activities should maintain full compliance with any documented manufacturer standards. Refer to section 6.1.
- III Where loads are reconfigured, Distributors should restore full compliance prior to outbound shipment.

6.2.2 Pallet Selection and Inventory Control

- I Distributors should maintain and utilize appropriate pallets for the load they are carrying or approved pallet SKUs appropriate for the products being handled.
- II Approved pallet inventory should include defined sizes and load ratings (dynamic and static)
- III Pallets used for repalletization should match or exceed the original load requirements.
- IV Damaged, weakened, or previously compromised pallets shall not be used
- V Standard pallets should not be used when they do not fully support the product footprint or load characteristics.

6.2.3 Four-Way Entry and Handling Accessibility

- I Distributors should utilize pallets that support safe and efficient mechanical handling.
- II Four-way entry pallets or skids should be used where feasible, particularly for Less-than-Truckload (LTL) shipments.
- III Pallets should include bottom deck boards or a perimeter base to improve stability and reduce fork damage.
- IV Fork entry access should be unobstructed and structurally sound.

6.2.4 Load Placement and Weight Distribution

- I Distributors should ensure proper load placement and weight distribution when palletizing or repalletizing freight.
- II Weight should be supported directly at primary load-bearing points (e.g., legs, wheels, base frame)
- III Blocking should be used to distribute the weight off the legs and wheels
- IV Load-bearing points should align with pallet runners, blocks, or reinforced deck areas.
- V For equipment with point loads, Plywood underlay or additional support should be installed.
- VI Load should be centered and squared on the pallet.
- VII The center of gravity should remain within the pallet footprint.
- VIII Top-heavy or unstable configurations shall not be used loads should be split across multiple pallets if required.

6.2.5 Assembly and Reconfiguration on Pallet

- I Where feasible, Distributors should assemble or reconfigure products directly on the pallet to minimize handling and repositioning.
- II Repackaging or consolidation activities should be completed on the pallet.
- III Loads should not require additional repositioning after palletization.
- IV Assembly methods should enhance stability and reduce handling exposure.

6.2.6 Product Securing and Re-Unitization

- I Distributors should ensure all palletized loads are properly secured to prevent movement during handling and transit.
- II Loads should be re-unitized using:
 - a. Minimum two (2) bands in perpendicular directions
 - b. Corner and edge protection to prevent damage from banding.
- III Stretch wrap should be considered supplemental only and should not replace structural securing methods.
- IV Securing methods should prevent shifting, loosening, or “walking” under vibration conditions.

6.2.7 Structural Reinforcement and Stack Integrity

- I Distributors should maintain or restore structural reinforcement required for stacking and transport.
- II Corner posts, top caps, or equivalent reinforcement should be applied where required.
- III Loads should maintain vertical sidewalls for stacking integrity.
- IV “Pyramid” or tapered configurations shall not be used
- V Rebuilt loads should withstand compression and lateral forces encountered during transit.

6.2.8 *Pallet Consolidation and Multi-Item Loads*

- I When consolidating multiple items, Distributors should ensure the combined load maintains structural integrity and stability.
- II Items should be arranged to distribute weight evenly across the pallet.
- III Consolidation should not create instability or unsupported load conditions.
- IV Mixed-product pallets should be secured to prevent movement and contact damage.

6.2.9 *Mode-Specific Requirements (Less-than-Truckload (LTL) vs. Full Truckload (FTL) vs. Container)*

- I Distributors should account for transportation mode when preparing palletized loads.
- II Less-Than-Truckload (LTL) Shipments:
 - a. Pallet builds should be designed for frequent handling and multi-contact environments.
 - b. Enhanced securing and structural integrity should be required.
- III Full Truckload (FTL):
 - a. Pallet builds should account for load shift during transit.
 - b. Structural integrity requirements remain applicable.

6.2.10 *Warehouse Operations and Training*

- I Distributors should implement training programs and operational controls to ensure compliant pallet build and handling practices. Personnel should be trained in:
 - a. Pallet selection and load rating requirements
 - b. Proper load placement and weight distribution
 - c. Securing and re-unitization methods
 - d. Identification of non-compliant pallet builds
- II Standard operating procedures should include inspection and corrective action protocols.

6.2.11 *Pallet Integrity Inspection (Quick Check Requirement)*

- I Distributors should perform a pre-shipment inspection of all palletized loads. Minimum inspection criteria include:
 - a. Pallet is structurally sound (no cracks, breaks, or weakness)
 - b. Four-way entry access is functional and unobstructed.
 - c. No protruding nails, fasteners, or sharp edges
 - d. No missing or damaged deck boards
 - e. Load is stable, centered, and fully secured.
- II Non-compliant pallets should be repaired or replaced prior to shipment.

6.3 Less-than-Truckload (LTL) Carrier Recommended Practices

6.3.1 General Requirement – Preservation of Pallet Integrity

- I The carrier should handle palletized freight in a manner that preserves the structural integrity of the pallet, load configuration, and securing methods throughout all handling, loading, transport, and delivery operations.
- II Carrier handling should not introduce damage or instability to otherwise compliant pallet builds.
- III Palletized loads should be maintained in their designed configuration unless corrective action is required.

6.3.2 Forklift Handling, Handtrucks, and Equipment Requirements

- I Forklift operations should be executed using equipment and techniques that fully support the pallet structure and load.
- II Forks should be of sufficient length to extend to or beyond the far-side runner or stringer.
- III Short forks that create leverage or bending forces shall not be used
- IV Fork spread should match pallet stringer or entry spacing.
- V Side entry should be prohibited on pallets designed for two-way entry only.
- VI Loads should be lifted and transported in a stable, level orientation.

6.3.3 Load Interaction and Stacking Controls

- I The carrier should manage stacking and load interaction in accordance with pallet design and structural limitations.
- II Palletized loads should not be double-stacked unless the pallet and load include corner posts, top caps, or equivalent structural reinforcement.
- III Stack limits should be respected based on pallet build and load configuration.
- IV Loads lacking structural stacking support should be treated as non-stackable.
- V Freight should not be loaded in a manner that creates point loading or uneven compression.

6.3.4 Pallet Condition and Corrective Action

- I The carrier should identify and address pallet damage during handling and terminal operations.
- II Pallets exhibiting:
 - a. Broken or cracked components
 - b. Missing deck boards
 - c. Structural weakness or instability
 - d. should be considered non-compliant for transport.
- III When pallet damage is identified:
 - a. Freight should be reworked onto a structurally sound pallet prior to linehaul movement.
 - b. Temporary handling without correction should be prohibited where progressive failure risk exists.

6.3.5 *Pallet Consolidation and Load Planning*

- I The carrier should not consolidate or reposition freight in a manner that compromises pallet integrity or load stability.
- II Freight should not be combined or reconfigured in ways that:
 - a. Exceed pallet capacity.
 - b. Create instability or uneven weight distribution.
- III Load planning should account for pallet strength and structural limitations.
- IV High-weight or sensitive loads should be positioned to minimize handling stress and contact exposure.

6.3.6 *Mode-Specific Handling Requirements*

- I The carrier should account for transportation mode when handling palletized freight.
- II Less-than-Truckload (LTL) Shipments:
 - a. Pallets should be handled with the expectation of multiple touches and high interaction frequency.
 - b. Structural integrity should be preserved across repeated handling events.
- III Full Truckload (FTL) Shipments:
 - a. Pallet handling should prevent load shifts and maintain structural alignment.
 - b. Stacking and positioning should account for transit forces.
- IV Containerized Shipments:
 - a. Palletized freight should be handled to withstand extended vibration and compression conditions.
 - b. Structural weaknesses should be corrected prior to container loading.

6.3.7 *Warehouse Operations and Training*

- I The carrier should maintain training programs to ensure proper handling of palletized freight. Dock personnel should be trained in:
 - a. Proper fork selection and positioning
 - b. Identification of pallet types (2-way vs. 4-way entry)
 - c. Recognition of structural pallet deficiencies
 - d. Safe stacking and load interaction practices
- II Standard operating procedures should define handling protocols for non-compliant pallets.

6.3.8 *Inspection and Handling Verification*

- I The carrier should perform routine inspection of palletized freight during handling operations. Minimum inspection criteria includes:
 - a. Pallet is structurally intact and capable of supporting the load.
 - b. Fork entry points are appropriate and undamaged.
 - c. Load is stable and properly secured.
- II No visible conditions exist that would lead to pallet failure during transit.
- III Non-compliant pallets should be subject to corrective action prior to further movement.

7. Product Overhang, Pallet Footprint Control, and Spacing

This standard establishes recommended best practices for maintaining proper product containment within the pallet footprint to minimize damage caused by overhang, inadequate support, and contact with adjacent freight. The recommendations apply to manufacturers, distributors, and Less-than-Truckload (LTL) carriers involved in the design, preparation, handling, transportation, storage, or inspection of palletized freight.

7.1 Manufacturer Recommended Practices

7.1.1 *General Requirement – Elimination of Product Overhang*

- I The manufacturer, when acting as the shipper, should ensure that no portion of the product, packaging, or unitized load extends beyond the perimeter of the supporting pallet or skid under any condition of transport, handling, or storage.
- II Product overhang is prohibited as a standard condition.
- III Packaging design should assume contact with adjacent freight and handling equipment.
- IV Loads should be fully contained within the pallet footprint.

7.1.2 *Pallet Footprint and Packaging Alignment*

- I The packaging footprint should be designed to fully match or be contained within the pallet dimensions, eliminating reliance on pallet overhang as a method of support.
- II All products and packaging should fit within the defined pallet footprint.
- III Standard pallets (e.g., 40" x 48") should not be used if the product exceeds those dimensions.
- IV Pallets or skids should be custom designed where required to fully support the load.
- V The pallet deck should provide continuous support across the product base.

7.1.3 *Minimum Clearance and Tolerances*

- I Product and packaging should maintain clearance from the pallet edge sufficient to prevent contact damage during handling and transit.
- II Required Tolerances:
 - a. Preferred condition: 2 inches from product or equipment to pallet edge
 - b. Acceptable condition: 0 inches overhang (fully contained load)
- III Any load exceeding these tolerances should be considered non-compliant.

7.1.4 *Pallet Build and Structural Integrity*

- I Pallets and skids should be constructed to support the full footprint and weight of the load without deflection, deformation, or unsupported edges.
- II Pallet design should align with product load distribution and center of gravity.
- III Deck boards and support members should prevent localized stress points.
- IV Loads should not rely on an overhanging structure for stability or support.

- V Pallet construction should withstand forklift handling, including partial or offset fork entry.

7.1.5 Perimeter Protection for Tight Tolerances

- I Where packaging tolerances approach pallet boundaries, rigid perimeter protection should be required. Acceptable methods, include:
 - a. Plywood collars
 - b. Edge rails or framing members
 - c. Reinforced perimeter blocking
- II Protection should absorb impact and prevent direct contact between product and adjacent freight.
- III Perimeter protection should be structurally integrated with the pallet or crate.

7.1.6 Oversized and Fixed-Footprint Products

- I Products with dimensions exceeding standard pallet sizes should utilize purpose-built pallets or skids designed to fully contain the load.
- II Oversized loads should not be placed on undersized pallets.
- III OEM-designed pallets or skids should be the default for Less-than-Truckload (LTL) shipments involving wide or irregular footprints.
- IV Load design should eliminate unsupported edges and overhang conditions.

7.1.7 Pallet Consolidation and Load Configuration

- I When consolidating multiple items onto a single pallet, the combined load should remain fully within the pallet footprint.
- II Consolidated loads should not create overhang conditions.
- III Mixed-product pallets should be configured to maintain edge clearance and stability.
- IV Load stacking should not extend beyond pallet boundaries at any level.

7.1.8 Mode-Specific Requirements (Less-than-Truckload (LTL) vs. Full Truckload (FTL) vs. Container)

- I Packaging design should account for transportation mode and associated handling conditions.
- II Less-than-Truckload (LTL) Shipments:
 - a. Zero overhang should be implemented due to high-contact, multi-handling environment.
 - b. Loads should be designed for frequent adjacent freight contact.
- III Full Truckload (FTL) Shipments:
 - a. Overhang should remain prohibited, though risk exposure is lower.
 - b. Loads should account for potential load shift during transit.
- IV Containerized Shipments:
 - a. Loads should be fully contained and blocked within pallet footprint.
 - b. Internal bracing should prevent movement and edge contact within the container.

7.1.9 Testing and Validation

- I Packaging configurations should be validated when pallet size, footprint, or structure is modified.
- II Compression Testing: Verify load stability and stacking integrity.
- III Fork-Impact Simulation: Validate pallet and load integrity under realistic handling conditions.
- IV Vibration Testing: Confirm load does not shift or degrade under transit conditions.
- V Testing may align with ASTM International ASTM D4169 or equivalent.

7.1.10 Warehouse Operations and Training

- I Warehouse and dock personnel should be trained to recognize and reject non-compliant pallet configurations.
- II Personnel should verify:
 - a. No product or packaging overhanging
 - b. Proper pallet size selection
 - c. Structural integrity of pallet and load
- III Non-compliant loads should not be tendered for shipment.
- IV Training programs should include visual standards and inspection criteria.

7.2 Distributor Recommended Practices

7.2.1 General Requirement – Preservation of Pallet Footprint Integrity

- I Distributors should not create, introduce, or propagate any condition in which product, packaging, or unitized loads extend beyond the perimeter of the supporting pallet or skid.
- II Product overhang should be prohibited at all stages of Distributors handling, including receiving, storage, consolidation, and outbound shipment.
- III Loads should remain fully contained within the pallet footprint after any Distributors intervention.

7.2.2 Inbound Inspection and Non-Conformance Control

- I Distributors should inspect all inbound freight for overhang and edge exposure prior to acceptance, storage, or reconsignment.
- II Freight exhibiting product or packaging overhang and/or corner exposure or unsupported edges should be refused or held for corrective action prior to further movement.
- III Non-compliant loads should not be tendered for outbound shipment without remediation.
- IV Distributors should document all instances of overhang:
 - a. Photographic evidence at receipt
 - b. Notation for carrier exception and OEM feedback loop

7.2.3 Repalletization and Cross-Docking Requirements

- I When cross-docking or repalletization is performed, Distributors should reconfigure freight to fully comply with pallet footprint requirements.
- II Prohibited Practices:
 - a. “Floating” cartons or products across multiple pallets
 - b. Allowing any portion of the load to extend beyond pallet boundaries
 - c. Reusing undersized pallets for oversized freight
- III Required Actions:
 - a. Freight should be reworked onto appropriately sized pallets or skids.
 - b. Loads exceeding standard pallet dimensions should be split across multiple pallets rather than creating overhang conditions.

7.2.4 Pallet Consolidation and Multi-Piece Orders

- I When consolidating multiple items or orders, Distributors should maintain full containment within pallet boundaries for each unitized load.
- II Consolidated loads should not result in overhang at any level.
- III Multi-piece shipments should be split into multiple pallets if required to maintain compliance.
- IV Mixed freight pallets should be configured to preserve structural integrity and edge clearance.

7.2.5 Minimum Clearance and Edge Protection

- I Distributors should maintain appropriate clearance and protection at pallet edges to prevent contact damage during handling and transit.
- II Minimum clearance should be 2 inches from the exterior of equipment or packaging to the pallet edge (target condition)
- III Where tight tolerances exist:
 - a. Sacrificial edge boards, corner posts, or equivalent protection should be installed.
 - b. Loads should be re-banded or secured to maintain alignment with pallet footprint.
- IV Under no condition should product or packaging extend beyond pallet edges without approved protection and compliance with maximum tolerance limits

7.2.6 Pallet Build and Structural Compliance

- I Distributors performing repalletization should ensure pallet construction meets or exceeds original load requirements.
- II Pallets should be sized appropriately to fully support the load footprint.
- III Pallet construction should support load weight, distribution, and center of gravity.
- IV Rebuilt pallets should maintain structural integrity under forklift handling and transit conditions.

7.2.7 Mode-Specific Handling Requirements

- I Distributors should account for the transportation mode when preparing outbound shipments.
- II Less-than-Truckload (LTL) Shipments:
 - a. Zero overhang should be implemented due to a high-contact environment.
 - b. Loads should be fully contained and protected against contact with adjacent freight.
- III Full Truckload (FTL) Shipments:
 - a. Overhang should remain prohibited, though exposure risk is reduced.
 - b. Loads should be secured to prevent shifting within the trailer.

7.2.8 Warehouse Operations and Training

- I Distributors should implement training programs and operational controls to prevent the creation of overhang conditions.
- II Warehouse personnel should be trained to:
 - a. Identify overhang and non-compliant pallet configurations
 - b. Execute proper repalletization and consolidation practices.
 - c. Apply edge protection and load stabilization methods.
- III Standard operating procedures should include visual inspection criteria and pass/fail thresholds.
- IV Non-compliant loads should be escalated and corrected prior to shipment.

7.2.9 Documentation and Continuous Improvement

- I Distributors should maintain records of overhang-related non-conformances and corrective actions.
- II Overhang incidents should be tracked and reported:
 - a. Source (manufacturer, inbound carrier, internal handling)
 - b. Corrective action taken.
- III Data should be used to inform suppliers of feedback and packaging improvements.

7.3 Less-than-Truckload (LTL) Carrier Recommended Practices

7.3.1 General Requirement – Management of Overhang Risk by Less-than-Truckload (LTL) Carriers

- I The carrier should identify, manage, and mitigate any condition in which product, packaging, or unitized loads extend beyond the perimeter of the supporting pallet or skid during handling, loading, transport, and delivery.
- II Product overhang should be treated as a high-risk condition for damage in Less-Than-Truckload (LTL) environments.
- III Carriers should not assume packaging is compliant and should actively manage visible overhang conditions.

7.3.2 Identification and Classification of Overhang

- I The carrier should inspect freight during handling and terminal operations to identify overhang conditions.
- II Overhang conditions include:
 - a. Products or cartons extending beyond the pallet footprint.
 - b. Exposed corners or unsupported edges
- III Identified overhang should be classified as non-standard freight requiring controlled handling.

7.3.3 Stacking and Load Interaction Controls

- I Freight exhibiting overhang should be subject to restricted stacking and contact conditions.
- II Freight with overhang should not be stacked upon or have freight stacked on top of it.
- III Such freight should be treated as non-stackable, unless a rigid perimeter collar or equivalent protection is present.
- IV Adjacent loading should prevent direct contact with exposed products or packaging surfaces.

7.3.4 Forklift Handling Requirements

- I Forklift operations should be executed to avoid contact with exposed products, cartons, or unsupported load areas.
- II Fork entry should be centered relative to pallet openings.
- III Fork spread should be appropriate to fully support the load base.
- IV Operators should avoid contact with any portion of the load extending beyond the pallet footprint.
- V Loads with overhang should be handled at reduced speed and with increased clearance awareness.

7.3.5 Terminal Handling and Corrective Action

- I When overhang is identified during terminal operations or at transfer of the item to the Less-than-Truckload (LTL) carrier, the carrier should take reasonable corrective action to reduce risk of damage.
- II Freight should be reworked onto a properly sized pallet where feasible and may be billed back to the shipper.
- III If freight should be reworked, the shipper should be notified
- IV If repalletization is not feasible:
 - a. Freight should be isolated from other shipments.
 - b. Freight should be clearly tagged or identified as high-risk.
- V Overhang conditions should not be ignored or passed through the network without mitigation.

7.3.6 Load Securement and Dunnage Application

- I The carrier should utilize load securement methods to prevent movement and contact when overhang conditions exist.

- II Load bars, straps, or equivalent devices should be used to prevent lateral movement.
- III Dunnage should be applied to create separation from adjacent freight where required.
- IV Overhanging freight should not be loaded in a manner that allows rubbing or impact during transit.

7.3.7 Pallet Consolidation and Load Planning

- I The carrier should not consolidate freight in a manner that creates or exacerbates overhang conditions.
- II Freight should not be repositioned or combined in a way that extends beyond pallet boundaries.
- III Load planning should account for existing overhang and position such freight to minimize exposure.
- IV High-risk freight should be placed in locations within the trailer that reduces incidental contact and frequency.

7.3.8 Mode-Specific Handling Requirements

- I The carrier should account for transportation mode when managing overhang conditions.
- II Less-Than-Truckload (LTL) Shipments:
 - a. Overhang should be treated as a high-risk condition requiring active mitigation.
 - b. Freight should be protected from multi-contact exposure inherent to Less-than-Truckload (LTL) operations.
- III Full Truckload (FTL) Shipments:
 - a. Overhang should still be controlled, though handling frequency is reduced.
 - b. Load securement should prevent intra-load contact.

7.3.9 Warehouse Operations and Training

- I The carrier should maintain training programs to ensure proper identification and handling of overhang conditions.
- II Dock personnel should be trained to:
 - a. Identify overhang and exposed load conditions.
 - b. Apply proper handling, isolation, and securement techniques.
 - c. Recognize when corrective action is required.
- III Training should include standard operating procedures for high-risk freight handling.

7.3.10 Documentation and Exception Handling

- I The carrier should document overhang conditions and associated handling actions.
- II Overhang should be recorded at the point of identification:
 - a. Terminal intake

- b. Cross-dock transfer
- III Documentation should include photographic evidence where feasible.
- IV Exceptions should be communicated for claim visibility and upstream correction.

8. Crate Rubbing - Abrasion and Inter-Freight Contact

This standard establishes recommended best practices for reducing freight damage resulting from abrasion, rubbing, compression, and contact between adjacent shipments during transportation and handling. The recommendations apply to manufacturers, distributors, and Less-than-Truckload (LTL) carriers responsible for packaging, handling, loading, transporting, or storing commercial foodservice equipment.

8.1 Manufacturer Recommended Practices

8.1.1 *General Requirement – Protection Against Inter-Freight Contact*

- I The shipper should ensure that all crates, pallets, and packaged articles are designed and constructed to prevent damage resulting from contact with adjacent freight, trailer walls, or handling equipment during normal transportation conditions, including multiple handling events and cross-docking.

8.1.2 *Crate Rubbing and Abrasion Resistance*

- I Packaging should be capable of withstanding repeated surface contact (“crate rubbing”) with other freight and trailer surfaces without compromise to structural integrity or product protection.
- II Exterior crate surfaces should incorporate abrasion-resistant materials (e.g., hardwood panels, reinforced corrugate, composite board, or equivalent)
- III Exposed edges and corners should be reinforced to prevent wear-through from lateral movement with a protectant wrap.
- IV Coatings, wraps, or surface treatments used should not degrade, tear, or delaminate under friction conditions typical of Less-than-Truckload (LTL) transit.
- V Packaging with smooth or low-friction surfaces should include additional stabilization measures (e.g., blocking, anti-slip materials)

8.1.3 *Three-Zone Protection (Bottom, Middle, Top Thirds)*

- I Crates and packaged freight should provide impact and abrasion protection across all vertical zones, recognizing that contact may occur at any height during loading, transit, or cross-docking.
- II Bottom Third
 - a. Reinforcement against forklift contact, pallet jack impact, and floor-level abrasion
 - b. Structural members should resist lateral shifting forces.
- III Middle Third
 - a. Protection against adjacent freight contact and lateral compression

- b. Sidewalls should resist puncture, crushing, and sustained rubbing.
- IV Top Third
 - a. Protection against overhanging freight, load shift, and partial stacking contact
 - b. Top edges and corners should be reinforced against downward or angled contact.
 - c. Stacking protocol to protect from stacking

8.1.4 *Less-Than-Truckload (LTL) vs. Full Truckload (FTL) vs. Containerized Shipments*

- I Packaging design should be appropriate to the transportation mode, with specific consideration given to the increased handling and contact exposure in Less-Than-Truckload (LTL) environments. All freight should be expected to move through Less-than-Truckload (LTL) environments.
- II Less-than-Truckload (LTL) Shipments:
 - a. Packaging should assume frequent contact with dissimilar freight.
 - b. Abrasion and side-impact protection should be mandatory.
 - c. Freight should be stable without reliance on continuous load containment.
- III Full Truckload (FTL) Shipments:
 - a. Packaging should account for limited but possible load shift.
 - b. Protection against intra-load contact should be maintained.
- IV Containerized Shipments:
 - a. Packaging should account for extended vibration duration and load compression.
 - b. Internal blocking and bracing should be required to prevent movement within the container.

8.1.5 *Load Interaction and Spacing*

- I Freight should be packaged and configured such that incidental contact with adjacent shipments does not result in damage.
- II Crates should not rely on separation or void space for protection.
- III Surfaces subject to contact should be designed as load bearing or abrasion-resistant zones.
- IV Protrusions, sharp edges, or unprotected components should be prohibited unless adequately shielded.

8.1.6 *Testing Requirements – Validation of Contact Durability*

- I Packaging systems should be validated through testing protocols that simulate contact, vibration, and handling conditions typical of Less-than-Truckload (LTL) and multi-modal transport before the first article ships.
- II Vibration Testing
 - a. Packaging should withstand sustained vibration profiles representative of over-the-road transport.
 - b. Testing may align with ASTM International ASTM D4169 or equivalent.
- III Drop Testing

- a. Packaging should withstand drops and impacts consistent with handling events.
 - b. Testing may align with ISTA protocols (e.g., ISTA 3A)
- IV Abrasion / Contact Simulation (Recommended Standard Enhancement)
 - a. Packaging should be evaluated for surface wear resistance under repeated lateral contact conditions.

8.1.7 *Vibration and Stabilization Technology*

- I Where required, packaging should incorporate vibration mitigation or stabilization features to reduce movement and contact-induced damage.
- II Use of anti-slip materials, load mats, or damping systems should be required where load instability is identified.
- III High-value or sensitive equipment should include internal cushioning or isolation systems.

8.1.8 *Loading Practices and Carrier Interaction*

- I The shipper should design packaging to withstand real-world loading conditions, recognizing that carrier loading practices may vary and are not controlled by the shipper.
- II Packaging should not rely on ideal loading conditions for protection.
- III When shipments are prepared for drop trailers or single-carrier cube-out configurations, packaging should withstand dense loading and lateral compression.
- IV Shippers assume that dock personnel will load freight in a manner consistent with maximizing trailer utilization, including close proximity placement.

8.2 *Distributor Recommended Practices*

8.2.1 *General Requirement – Protection Against Inter-Freight Contact*

- I The Distributor should ensure that all crates, pallets, and packaged articles are designed and constructed to prevent damage resulting from contact with adjacent freight, trailer walls, or handling equipment during normal transportation conditions, including multiple handling events and cross-docking.

8.2.2 *Crate Rubbing and Abrasion Resistance*

- I Packaging should be capable of withstanding repeated surface contact (“crate rubbing”) with other freight and trailer surfaces without compromise to structural integrity or product protection.
- II Exterior crate surfaces should incorporate abrasion-resistant materials (e.g., hardwood panels, reinforced corrugate, composite board, or equivalent)
- III Exposed edges and corners should be reinforced to prevent wear-through from lateral movement.
- IV Coatings, wraps, or surface treatments used should not degrade, tear, or delaminate under friction conditions typical of Less-than-Truckload (LTL) transit.

8.2.3 *Three-Zone Protection (Bottom, Middle, Top Thirds)*

- I Crates and packaged freight should provide impact and abrasion protection across all vertical zones, recognizing that contact may occur at any height during loading, transit, or cross-docking.
- II Bottom Third
 - a. Reinforcement against forklift contact, pallet jack impact, and floor-level abrasion
 - b. Structural members should resist lateral shifting forces.
- III Middle Third
 - a. Protection against adjacent freight contact and lateral compression
 - b. Sidewalls should resist puncture, crushing, and sustained rubbing.
- IV Top Third
 - a. Protection against overhanging freight, load shift, and partial stacking contact
 - b. Top edges and corners should be reinforced against downward or angled contact.
 - c. Stacking Protection

8.2.4 *Less-than-Truckload (LTL) vs. Full Truckload (FTL)*

- I Packaging design should be appropriate to the transportation mode, with specific consideration given to the increased handling and contact exposure in Less-than-Truckload (LTL) environments.
- II Less-than-Truckload (LTL) Shipments:
 - a. Packaging should assume frequent contact with dissimilar freight.
 - b. Abrasion and side-impact protection should be mandatory.
 - c. Freight should be stable without reliance on continuous load containment.
- III Full Truckload (FTL) Shipments:
 - a. Packaging should account for a limited but possible load shift.
 - b. Protection against intra-load contact should be maintained.

8.2.5 *Load Interaction and Spacing*

- I Freight should be packaged and configured such that incidental contact with adjacent shipments does not result in damage.
- II Crates should not rely on separation or void space for protection.
- III Surfaces subject to contact should be designed as load-bearing or abrasion-resistant zones.
- IV Protrusions, sharp edges, or unprotected components should be prohibited unless adequately shielded.

8.2.6 *Vibration and Stabilization Technology*

- I Where required, packaging should incorporate vibration mitigation or stabilization features to reduce movement and contact-induced damage.
- II The use of anti-slip materials, load mats, or damping systems should be required where load instability is identified.

- III High-value or sensitive equipment should include internal cushioning or isolation systems.

8.2.7 *Loading Practices and Carrier Interaction*

- I The shipper should design packaging to withstand real-world loading conditions, recognizing that carrier loading practices may vary and are not controlled by the shipper.
- II Packaging should not rely on ideal loading conditions for protection.
- III When shipments are prepared for drop trailers or single-carrier cube-out configurations, packaging should withstand dense loading and lateral compression.
- IV Shippers should assume that dock personnel will load freight in a manner consistent with maximizing trailer utilization, including close proximity placement.

8.3 Less-than-Truckload (LTL) Carrier Recommended Practices

8.3.1 *General Requirement – Prevention of Damage from Contact*

- I The carrier should handle, load, transport, and deliver freight in a manner that minimizes damage resulting from contact between shipments, trailer surfaces, and handling equipment under normal Less-than-Truckload (LTL) operating conditions, including multiple handling events and cross-docking.

8.3.2 *Dunnage Placement and Load Separation*

- I The carrier should utilize appropriate dunnage, load bars, straps, or equivalent separation methods to prevent damaging contact between adjacent shipments.
- II Dunnage should be placed between freight units where:
 - a. Surface contact may result in abrasion, puncture, or deformation.
 - b. Freight includes mixed materials (e.g., metal-to-wood, sharp-to-soft packaging)
- III Dunnage materials should be of sufficient strength and thickness to maintain separation under transit vibration and load shift.
- IV Freight should not be loaded in direct contact with the packaging when the packaging is not designed as a load-bearing or abrasion-resistant surface.

8.3.3 *Trailer Condition and Suitability*

- I Equipment used in transport should be maintained in a condition that does not introduce damage risks to freight.
- II Trailers should be free of sharp protrusions, exposed fasteners, broken flooring, or debris that could damage freight
- III E-track systems and other securement hardware should be intact, properly fastened, and not present exposed edges or deformation.
- IV Trailer interiors should be inspected prior to loading, and unsafe conditions should be corrected or the equipment removed from service.

8.3.4 Load Planning and Freight Organization

- I The carrier should plan and execute load configurations to minimize handling frequency and inter-freight contact.
- II Freight should be organized by delivery sequence and destination to reduce unnecessary cross-docking and rehandling.
- III Carriers should make reasonable efforts to minimize the number of handling events, consistent with efficient route planning.
- IV Freight with known sensitivity to contact or abrasion should be positioned to reduce exposure to high-contact zones.

8.3.5 Cross-Docking and Handling Frequency

- I The carrier should recognize cross-docking as a standard condition of Less-than-Truckload (LTL) transport and manage handling accordingly.
- II “Normal” Less-than-Truckload (LTL) handling should be defined as multiple terminal transfers, typically involving 3–6 handling events.
- III Carriers should not subject freight to excessive or unnecessary handling beyond normal operational requirements
- IV Rehandling practices should be controlled to prevent cumulative damage from repeated contact or movement.

8.3.6 Pick Location and Handling Efficiency

- I Freight tendered in a consolidated or single pick location should be handled in a manner that minimizes unnecessary repositioning and contact.
- II When freight is staged in a single location:
 - a. Carriers should plan loading to reduce multiple forklift touches.
 - b. Freight should not be repeatedly repositioned in a manner that increases contact risk.
- III Forklift operations should account for spatial constraints and avoid contact with adjacent freight during extraction and placement.

8.3.7 Training and Handling Documentation

- I The carrier should maintain training programs and documentation standards to ensure proper handling of packaged freight.
- II Dock and handling personnel should be trained in:
 - a. Identification of handling labels (e.g., “Do Not Stack,” “Fragile,” “This Side Up”)
 - b. Recognition of packaging designed for vs. not designed for contact.
 - c. Proper use of dunnage and load securement equipment
- III Carriers should maintain documented procedures for:
 - a. Freight segregation
 - b. Load securement
 - c. Damage prevention practices.

8.3.8 Label Recognition and Compliance

- I The carrier should observe and comply with all visible handling and packaging instructions provided by the shipper.
- II Labels indicating orientation, stacking limitations, or handling constraints should be followed.
- III Absence of labeling should not relieve the carrier of responsibility to handle freight in accordance with standard industry practices.

8.3.9 Concealed Damage Inspection and Reporting

- I The receiver should be responsible for timely inspection and reporting of concealed damage, and the carrier should support this process through clear documentation and training.
- II Receiver Responsibilities:
 - a. Shipments should be inspected within a reasonable time after delivery for concealed damage.
 - b. Damage should be reported in accordance with carrier claim requirements and timelines.
- III Carrier Responsibilities:
 - a. Carriers should provide clear delivery documentation and inspection guidance.
 - b. Carriers should maintain processes for handling concealed damage claims, including traceability of handling events.

8.3.10 Contact-Resilient Handling Expectation

- I The carrier should assume that freight may come into incidental contact with adjacent shipments and should take reasonable steps to prevent such contact from resulting in damage.
- II Freight should not be handled in a manner that assumes isolation or separation unless physically provided.
- III Where contact is unavoidable, protective measures (dunnage, spacing, positioning) should be implemented.

9. Labeling and Training

This standard establishes recommended best practices for the development, application, communication, and recognition of freight handling labels and for the training of personnel responsible for packaging, handling, transporting, receiving, and inspecting commercial foodservice equipment. The recommendations apply to manufacturers, distributors, and Less-than-Truckload (LTL) carriers and are intended to promote consistent communication, improve handling practices, and reduce preventable freight damage throughout the supply chain.

9.1 Manufacturer Recommended Practices

9.1.1 *General Requirement – Labeling for Real-World Handling*

- I The shipper should design and apply labeling, packaging, and training systems that communicate critical handling, identification, and safety information in a manner that remains effective under normal transportation conditions, including multiple handling events, cross-docking, and varied carrier environments.
- II Labeling should be durable, visible, and redundant.
- III Pallet labeling should be sized and designed so that it is legible from at least 10 ft. away.
- IV Labeling systems should not rely solely on carrier compliance or interpretation. Packaging and skid systems should also be designed to reduce the likelihood and severity of damage resulting from foreseeable handling variability.
- V Training programs should ensure consistent execution at the point of origin.

9.1.2 *Standardized Label Content and Placement*

- I All shipments should include standardized labeling applied in consistent locations to ensure visibility during handling. Required content includes:
 - a. SKU / Product Identifier
 - b. Barcode / UPC
 - c. Purchase Order (PO) or shipment reference
 - d. Weight and dimensions
 - e. Center of gravity (CG), where applicable
 - f. NMFC classification
 - g. Clearly identified lift points
- II Placement Requirements:
 - a. Labels should be applied on a minimum of two (2) adjacent sides of the package or crate with at a minimum the side where forks can enter the pallet
 - b. Labels should be positioned at eye level where feasible and unobstructed by packaging materials or banding
 - c. Label placement should remain visible after palletization, wrapping, or consolidation

9.1.3 *Handling Instructions and Visual Communication*

- I Packages should include clear, standardized handling instructions using both symbols and plain language.
- II Standardized handling icons should be used (e.g., orientation, stacking limits, fragility)
- III Plain-language instructions should accompany icons, including but not limited to:
 - a. “FORK FROM THIS SIDE ONLY”
 - b. “DO NOT STACK”

- IV Where directional fork entry is required, packaging and skid design should reinforce the intended handling direction and reduce the likelihood of improper forklift entry whenever practical.
- V This example illustrates how visual communication can be combined with packaging design to reinforce intended handling practices throughout the Less-than-Truckload (LTL) network.



Figure 1. Example of manufacturer-applied handling instructions used to reinforce intended forklift entry direction and communicate handling requirements.

- VI Instructions should be concise, legible, and resistant to wear or removal.

9.1.4 Load Identification and Special Condition Labeling

- I Shipments requiring special handling due to size, weight, or configuration should include appropriate handling labels to communicate any special transportation or handling requirements.
- II Loads with uneven weight distribution should indicate the heaviest side, where applicable
- III Center of gravity should be identified for shipments where it is not readily apparent, including tall, top-heavy, or asymmetrically loaded products
- IV Manufacturers should evaluate both center-of-gravity markings and physical packaging features that discourage improper lifting directions where appropriate
- V Fork pocket locations should be clearly marked to guide proper forklift handling

9.1.5 *Claims Visibility and Monitoring*

- I The shipper should implement labeling or monitoring systems to improve visibility and documentation of damage events.
- II “Claims watch” or high-value indicators may be applied, but should not be relied upon as the sole method of damage prevention
- III Where appropriate, impact or tilt sensors should be considered to:
 - a. Provide objective evidence of handling conditions
 - b. Support claims investigation, root-cause analysis, and continuous improvement efforts

9.1.6 *Documentation Access and Digital Integration*

- I Shipments should include documentation sufficient to support handling and receiving processes.
- II Where appropriate, a QR code or equivalent digital access point should be provided, linking to:
 - a. Product information
 - b. Pack-out standard operating procedures (SOPs)
 - c. Receiving inspection checklists
- III Documentation should be readily accessible to receiving personnel
- IV Digital access, where provided, should remain functional throughout the shipment lifecycle

9.1.7 *Label Durability and Environmental Performance*

- I Labels should be designed to withstand environmental conditions encountered during transport and storage.
- II Labels should remain legible and adhered under:
 - a. Humidity
 - b. Temperature variation (hot and cold conditions)
 - c. Surface abrasion and handling
 - d. Ultraviolet (UV) exposure, where outdoor storage or transport is anticipated
- III Adhesives and materials should be selected based on the packaging surface and environment
- IV Label performance should be validated through periodic testing and audits

9.1.8 *Training Programs and Standard Operating Procedures*

- I The shipper should implement formal training programs and documented procedures to ensure consistent labeling and packaging execution. Training should include:
 - a. Label content and placement standards
 - b. Handling communication requirements
 - c. Identification of special handling conditions
 - d. Verification that packaging and labeling requirements have been properly implemented prior to shipment

- II Training should be conducted at least annually for pack-out and warehouse personnel
- III Standard operating procedures (SOPs) should be documented, maintained, and accessible

9.1.9 Real-World Handling Alignment and Carrier Interaction

- I The shipper should design packaging and labeling practices to reflect actual carrier handling conditions.
- II Packaging and labeling systems should be validated through real-world handling scenarios, including:
 - a. Liftgate operations
 - b. Trailer loading configurations
 - c. Cross-docking operations
 - d. Repeated forklift handling
 - e. Handling variability representative of normal Less-than-Truckload (LTL) transportation
- III Where feasible, training programs should include interaction with carriers, such as:
 - a. Onsite demonstrations
 - b. Observations of loading and handling practices
- IV The shipper should assume variability in carrier training and handling practices and design packaging, skid, and labeling systems in consideration of this variability and not relying solely on instructions, policies, and handling procedures.

9.1.10 Warehouse Operations and Continuous Improvement

- I The shipper should monitor and continuously improve labeling effectiveness
- II Label placement and performance should be audited periodically
- III Feedback from the following should be incorporated into labeling improvements:
 - a. Carriers
 - b. Distributors
 - c. Damage claims data
- IV Packaging, skid, and labeling systems should evolve based on observed handling conditions, freight damage trends, and identified failure modes

9.2 Distributor Recommended Practices

9.2.1 General Requirement – Preservation and Update of Labeling Integrity

- I Distributors should preserve the visibility, accuracy, and effectiveness of all package labeling and should update labeling when repalletization or reconfiguration occurs to ensure current handling instructions are clearly communicated.
- II Dealer activities should not obscure, remove, or degrade required labels

- III Where configuration changes occur, dealers should re-establish compliant labeling prior to outbound shipment
- IV Where repalletization or skid replacement is required, the manufacturer's intended handling characteristics, including designated fork-entry locations and load orientation, should be maintained whenever practical.

9.2.2 Label Visibility and Placement Control

- I Labels should remain visible and legible throughout receiving, storage, consolidation, and outbound shipment.
- II Required labels (SKU, PO, weight, dimensions, NMFC class, lift points) should remain visible on at least two (2) adjacent sides, and at a minimum the side of the shipment where the forks enter the pallet
- III Labels should not be covered by stretch wrap, banding, or consolidation materials
- IV When labels are obscured due to repalletization:
 - a. Labels should be reapplied or duplicated in compliant positions
 - b. Special handling information, including lift points, orientation, center-of-gravity markings, and other manufacturer handling instructions, should be preserved

9.2.3 Repack and Relabeling Requirements

- II When freight is repalletized, consolidated, or otherwise modified, distributors should apply updated labeling reflecting the current configuration and handling requirements.
- III Repack labels should be applied to all reconfigured shipments
- IV Repack labels should reflect:
 - a. Updated pallet configuration
 - b. Current handling instructions
 - c. Any changes to weight distribution or footprint
- V Original OEM labels should not be relied upon if they are no longer visible or accurate
- VI Where repalletization or skid replacement is performed, the repackaged shipment should preserve the manufacturer's intended handling characteristics, including designated fork-entry locations, load orientation, and center-of-gravity considerations, whenever practical.

9.2.4 Handling Instructions and Special Condition Labeling

- I Dealers should ensure all handling instructions remain accurate and visible after any handling or reconfiguration.
- II Standard handling instructions should be preserved or reapplied, including:
 - a. "FORK FROM THIS SIDE ONLY"
 - b. "DO NOT STACK"
- III Where shipments require special handling due to size, weight, configuration, or repalletization, appropriate handling labels should be maintained or updated to reflect the current shipment configuration.

- IV Loads with uneven weight distribution should indicate the heaviest side where applicable
- V Center-of-gravity markings and designated lift-point information should be preserved or updated whenever applicable to the modified shipment configuration.

9.2.5 Claims Visibility and Practical Application

- I Dealers should apply labeling and documentation practices that improve claim defensibility while recognizing operational limitations.
- II “Claims watch” or high-value labels may be used, but should not be relied upon as the sole method of damage prevention or carrier compliance
- III Labeling systems should prioritize visibility and redundancy over complexity
- IV Distributors should assume variability in carrier training and handling practices
- V Where damage is identified during receiving, distributors should document the condition of the shipment prior to repalletization, rework, or redistribution whenever practical.

9.2.6 Receiving Inspection Training and Execution

- I Distributors should implement standardized receiving inspection procedures to identify and document damage at the point of receipt.
- II Receiving personnel should be trained to perform a rapid inspection (≤2 minutes), including:
 - a. Pallet/base condition
 - b. Corners and edges
 - c. Tilt or impact indicators (if present)
 - d. Visible punctures or deformation
 - e. Condition of handling features, including designated fork-entry locations and load stability, where applicable
- III Shipments should be photographed prior to acceptance when damage is suspected
- IV Inspection should occur before signing delivery documentation

9.2.7 Bill of Lading (BOL) Exception Handling

- I Distributors should document visible damage accurately and consistently at the time of delivery.
- II Standardized exception language should be used on the Bill of Lading (BOL)
- III Shipments with visible damage should not be signed as “clear”
- IV Photographic documentation should accompany BOL exceptions whenever practical to support claims and root-cause analysis.
- V Concealed damage should be documented and reported within five (5) business days of delivery, or in accordance with applicable carrier claim requirements, whichever is sooner.
- VI Escalation procedures should be defined and followed for damaged freight
- VII Documentation should support downstream claims processing

9.2.8 Training Programs and Standard Operating Procedures

- I Distributors should implement training programs and documented procedures to ensure consistent labeling and inspection practices. Training should include:
 - a. Label visibility and placement standards
 - b. Repack and relabeling procedures
 - c. Receiving inspection and documentation requirements
 - d. Handling of non-compliant or damaged freight
 - e. Preservation of manufacturer handling instructions during repalletization or shipment reconfiguration
- II Training should be conducted at least annually
- III Standard operating procedures (SOPs) should be documented, maintained, and accessible

9.2.9 Real-World Handling Alignment and Carrier Interaction

- I Dealers should align labeling and handling practices with actual carrier operations.
- II Where feasible, dealers should conduct or participate in real-world handling demonstrations, including:
 - a. Liftgate operations
 - b. Trailer loading practices
 - c. Cross-docking and repeated handling representative of normal Less-than-Truckload (LTL) operations
- III Dealer processes should reflect how freight is actually handled, not idealized conditions
- IV Dealers should recognize that carrier personnel turnover and variability limit reliance on training alone and should preserve manufacturer packaging and handling methods whenever practical.

9.2.10 Damage Tracking and Feedback Loop

- I Dealers should maintain a structured process for tracking and communicating damage trends.
- II Damage incidents should be logged and categorized, including:
 - a. Fork puncture
 - b. Crate rubbing
 - c. Tipping or instability
 - d. Skid or pallet damage
- III Data should be reviewed and shared periodically with:
 - a. Manufacturers (OEMs)
 - b. Carriers
- IV Where practical, damage reports should include photographs, a description of the observed damage, and the suspected cause to support root-cause analysis.
- V Feedback should be used to drive improvements in packaging, labeling, and handling practices

9.3 Less-than-Truckload (LTL) Carrier Recommended Practices

9.3.1 *General Requirement – Interpretation and Preservation of Labeling*

- I The carrier should interpret, preserve, and act upon package labeling in a manner that supports safe handling, accurate identification, and damage prevention under normal Less-than-Truckload (LTL) operating conditions, including multiple handling events and cross-docking.
- II Labels should be treated as critical handling inputs, not optional guidance
- III Labeling should supplement, but not replace, proper handling practices and packaging design
- IV Where manufacturers have incorporated designated fork-entry locations or other engineered handling features, carriers should treat those features as part of the intended handling method

9.3.2 *Label Visibility and Scan Accessibility*

- I The carrier should ensure all required labels remain visible and scannable throughout terminal handling and transport operations.
- II Labels should not be obscured, buried, or rendered inaccessible during loading, consolidation, or storage
- III If a label becomes obscured, a terminal-applied label should be affixed on an accessible side
- IV Barcode and identification labels should remain scannable without repositioning freight where feasible
- V Freight should be positioned to maintain label visibility during handling operations
- VI Handling instructions, including designated lift points, orientation, and other manufacturer handling labels, should remain visible whenever practical.

9.3.3 *Handling Based on Labeling and Physical Indicators*

- I The carrier should follow handling instructions indicated by labeling while also adhering to physical load indicators and structural constraints.
- II Handling instructions (e.g., “DO NOT STACK”, “FORK FROM THIS SIDE ONLY”) should be followed where visible and applicable
- III Forklift operations should prioritize marked lift points, center-of-gravity indicators, and intended fork-entry locations over convenience
- IV Where manufacturers have incorporated engineered handling features, including designated fork-entry locations, carriers should utilize those features as intended whenever practical
- V Labels should not override safe handling practices or structural limitations of the load
- VI In the absence of visible labels, operators should default to conservative handling practices

9.3.4 *Standardized Terminal Handling Codes*

- I The carrier should utilize standardized handling codes within terminal systems to communicate special handling requirements.
- II Terminal systems should include and apply codes such as:
 - a. "Do Not Stack"
 - b. "High Value"
 - c. "Restricted Fork Entry" or other shipment-specific handling codes, where applicable
- III Handling codes should be applied consistently and communicated across all terminals involved in shipment movement
- IV Codes should align with visible labeling and known shipment characteristics

9.3.5 *Training Programs and Standard Operating Procedures*

- I The carrier should implement training programs and documented procedures to ensure consistent interpretation and application of labeling.
- II Dock personnel and drivers should be trained in:
 - a. Identification and interpretation of standard handling labels
 - b. Proper response to lift-point and center of gravity markings
 - c. Recognition and use of manufacturer-designated handling features, including designated fork-entry locations, where applicable
 - d. Recognition of labeling limitations and the need for supplemental judgment
- III Training programs should emphasize:
 - a. Labels support handling—but do not replace proper technique
 - b. Variability in packaging and labeling across shippers
- IV Standard operating procedures (SOPs) should define required actions for labeled and unlabeled freight conditions

9.3.6 *Real-World Handling Alignment and Shipper Coordination*

- I The carrier should align training and handling practices with real-world loading conditions and shipper practices.
- II Where feasible, carriers should participate in joint training or demonstrations with shippers, including:
 - a. Liftgate operations
 - b. Trailer loading practices
 - c. Cross-docking and terminal handling operations
- III Handling practices should reflect how freight is intended to be handled by the manufacturer while recognizing the realities of repeated Less-than-Truckload (LTL) handling throughout the transportation network.
- IV Carriers should recognize that packaging and labeling are designed for real-world variability, not ideal conditions

9.3.7 *Concealed Damage Prevention Practices*

- I The carrier should implement handling practices that reduce the risk of concealed damage not immediately visible at delivery.

- II Re-handling should be minimized where operationally feasible
- III Freight should not be tightly packed against rigid or incompatible surfaces where damage risk exists
- IV Load placement should account for vibration, shifting, contact exposure, and the stability of tall or top-heavy freight during transit
- V Labeling indicating sensitivity should inform placement and handling decisions
- VI Where designated fork-entry locations or orientation requirements are provided by the manufacturer, they should be maintained throughout handling and transport, whenever practical

9.3.8 Label Integrity and Preservation

- I The carrier should not remove, deface, or alter original shipper labels except where necessary to maintain visibility or compliance.
- II Original labels should be preserved wherever possible
- III Terminal-applied labels should not conflict with or obscure critical shipper-provided information
- IV Handling information, including lift points, orientation, center-of-gravity markings, and other manufacturer handling instructions, should remain visible whenever practical
- V Any relabeling should maintain consistency with shipment identification and handling requirements

9.3.9 Inspection and Exception Handling

- I The carrier should observe labeling conditions during handling and identify inconsistencies or risks.
- II Missing, damaged, or conflicting labels should be noted and addressed where feasible
- III Visible discrepancies between labeling and load condition should be escalated according to carrier procedures
- IV Where practical, photographs should be taken to document visible damage, labeling discrepancies, or handling concerns identified during shipment movement
- V Documentation should support traceability and claims evaluation