

Best Practices: Implementing Hygienic Plastic Reusable Pallets in Food Plants

ORBIS Corporation

Executive Overview

Today's food supply chain is becoming more and more complex. With shorter product life cycles and rising customer demands, today's food companies are looking to improve the way they store, manage, retrieve and distribute product throughout their supply chain.

"The rule of thumb is that anything moving into the production area is moved on a plastic pallet. A plastic pallet can be cleaned and sanitized, and it eliminates the potential contamination from wood and metal (nails or staples) in a production area."¹

Plastic reusable pallets improve the flow of product to reduce total costs, drive sustainability and optimize operations. When storing or handling ingredients in a food processing plant, plastic reusable pallets can help move product faster, safer and more cost effectively, with a lower cost-per-turn. Users experience a rapid return on their packaging investment...many times in 6-18 months or less.

In this paper, we will share current industry trends and best practices for implementing reusable plastic pallets into food plants.

Trends Facing Today's Food Plants

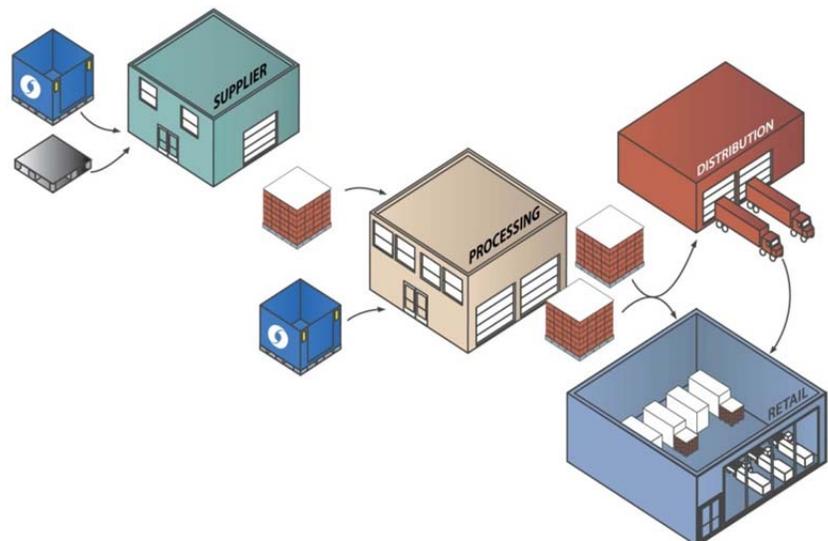
In food plants, interface with high-speed material handling equipment, minimizing unload time and reducing product damage are priorities. Today's plants are seeking ways to more efficiently store and manage the optimal amount of product until it is needed by its supply chain partners. Current trends include:

- **The need for a hygienic environment:** From equipment to pallets.
- **New technology:**
 - Separation equipment, including metal detection equipment and X-ray detection equipment⁹
 - Rinsers
 - Allergen management processes
 - Tracking/identification/traceability
 - Antimicrobial materials
- **New plants:** Newly constructed plants, or retrofitting/renovating older plants with new equipment
- **The need to optimize existing space:** It is more affordable and easier to use vertical space than to build/expand the facility footprint.
- **Rising labor costs:** Labor rates, employee insurance, employee benefits, etc.
- **Increasing use of automation and robotics to reduce travel time and increase throughput:** Increased use of articulated trucks, lights-out facilities, etc.
- **Food Safety and Modernization Act (FSMA):** Aimed at ensuring the safety of the food supply chain.

Pallet Requirements in Food Plants

Since the pallet will have the most touches with your product and equipment on a regular basis, pallet selection needs to be part of the decision making process when planning a new plant or reconfiguring current facilities. The following criteria are important when evaluating plastic pallets for a food plant:

- The pallet must meet cleanliness requirements (hygienic design and easy to sanitize)
- The pallet must withstand the environment (temperature, moisture, etc.)
- The pallet must reduce risk of product damage
- The pallet must have consistent load ratings and dimensions
- To provide an acceptable return on investment (ROI), the pallet must be able to be reused over and over again
- The pallet must provide consistent, repeatable performance during its entire service life

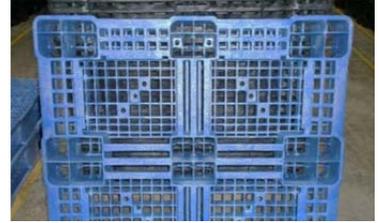


Hygienic Plastic Pallets: Defined

Hygienic plastic pallets are defined as easily sanitized, non-porous platforms designed to cleanly move and store food product within a facility and support sanitary conditions.

Characteristics include:

- Minimized areas for contaminants to collect, with no hidden cavities or hollow areas. FDA approved material for direct food contact.
- Open deck for flow-through for easy cleaning and fast drying.
- Contoured surfaces/corners that lowers risk of product damage from punctures or snags.
- No rust, nails, staples or loose boards. Non-rusting.
- Does not absorb moisture or odor.



Plastic pallet with open, flow-through design.

Plastic Pallet Selection

Plastic pallets are available in a wide variety of footprints and styles. Users should evaluate their system to determine the pallet style that best meets their application requirements.

Rackable plastic pallets should be considered if:

- Your unsupported pallet racks requires dimensionally consistent pallets.
- Your current pallets are causing costly product damage (loose boards, nails, etc).
- Your current pallets need frequent repair.
- Added investments sometimes need to be made in pallet support bars or wire decking, to adequately support pallets in racks.

Nestable plastic pallets should be considered if:

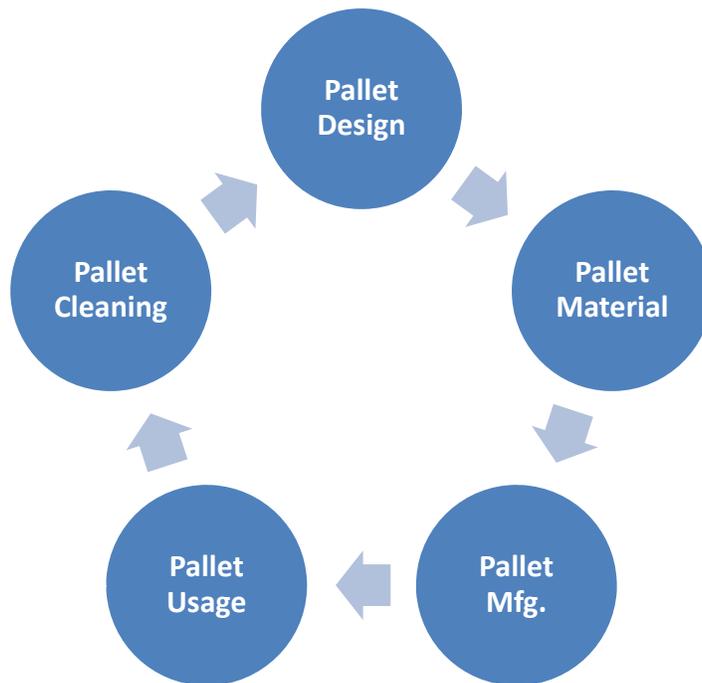
- Your warehouse space is limited and you have a regular need to nest pallets to store more pallets in a smaller area.
- You can't afford costly automated system downtime caused by single-use pallets halting the system.

Stackable plastic pallets should be considered if:

- Your typical product loads are extremely heavy.
- You frequently convey pallets in your facility, so the pallet height and bottom deck surface is important.
- Your ASRS, AGVs or high rise storage system is requiring a dimensionally consistent pallet.
- Product loads are weighed frequently for inventory control.

Impact of the Pallet Life Cycle on Plant Cleanliness

It is important to understand how the entire life cycle of the pallet can impact a plant's cleanliness, from pallet design and material to usage and cleaning.



Pallet Design Best Practices

- Minimal surface area to be cleaned.²
- Non-porous, non-hydroscopic material that not absorb moisture.
- One-piece design with no crevices, cells, hollow areas or cavities for contaminants to collect, regardless of pallet orientation (upright, on floor, etc.).
- No sharp edges or protruding fasteners that can damage cases. No nails or staples.
- Open deck for flow-through cleaning and fast drying.
- Dimensionally consistent designs ensure repeatable performance.

Pallet Material Innovations

- FDA-approved material, for direct food contact. FDA-approved material has 100% virgin content.
- Materials that do not readily absorb environmental contaminants like odors, bacteria, pesticides, etc.
- Materials that allow for high-temperature washing.
- Materials that are X-ray and metal detectable.
- Custom colors to color code and segregate loads (allergen management, sorting lot #s, etc.)
- Labels/hot stamping to identify pallets for lot numbers and for separation purposes.

Pallet Manufacturing Best Practices

- Precise molding ensures dimensional consistency.
- Utilize ISO 9001 certified facilities.

Pallet Cleaning Options

- *Microbiological Cleaning, or Industrial Sterilization*
 - High-heat cleaning process where a minimal temperatures of 165° F is sustained and sterile conditions are maintained in a designated cleanroom.
 - After cleaning, pallets are wrapped or bagged and stored in the cleanroom. Fully documented.
 - Most effective against a broad spectrum of impurities.
 - Examples:
 - Traditional pallet washers: Wash/rinse conveyor system.
 - UV or steam cleaning
- *Non-Microbiological Cleaning:*
 - Cleaning process where no minimal temperature or designated cleanroom is required.
 - Examples:
 - Spray/power washing: Spot cleaning.
 - Manual cleaning: Hand washing.
 - Air compressor: To clean dust and debris.



Cleaning Trends

- Today there is no current standardized process, but retailers and food, beverage and pharmaceutical CPGs are looking for more standardization to preserve the supply chain.
- ISO22001 certification for cleaning operations
- Under the new FSMA, pallets should be easy to access and inspect.²

Getting Started with Plastic Pallet Implementation

1. Analyze: Start with full plant analysis

- Review your product life cycle
- Identify load type – Dimensions, weight, value, type (boxes/cases, powder, liquid, etc.), load distribution, temperature
- Determine automation interfaces and material handling touchpoints
- Identify number of pallets used annually, pallet turns, etc.
- Quantify product damage rates
- Identify storage practices (Racked storage? Stack loads? Floor storage? Indoor/outdoor?)
- Determine labor/workforce factors (# of shifts, union, seasonal, etc.)
- Define cleanliness requirements (Will the pallet need periodic cleaning?)
- Identify supply chain partners (Inbound shipments, outbound shipments?)
- Determine if there any insurance considerations
- Review the environment. Is it a food grade environment? Is FDA material required?
- Confirm dimensional pallet footprint
- Determine best pallet style for the application (rackable, nestable or stackable)

2. Identify solution and prove

- Based on requirements, identify potential pallet solutions
- Calculate the return-on-investment (ROI)
- Calculate the cost-per-trip or cost-per-turn
- Conduct pilot/test in your environment (usability, employees, automation interface, etc.)
- Collaboration is key. Work with supply chain partners to identify needs and requirements.

3. Design your pallet program

- Based on the pilot results, fully design pallet program (number of pallets needed, implementation dates, facility readiness, etc.)

4. Implement the pallet program

- Train users (forklift operators, material handlers, etc.)
- Fully execute the pallet program

5. Evolve, with eye for continuous improvement

- Monitor and measure success
- Identify future opportunities for additional efficiencies

Critical Success Factors

Begin with a pilot program

Depending on your organization, it often is beneficial to start your pallet program roll-out with a pilot program, then learn from it, adjust the process and take the next step. By choosing to begin with a specific supplier, production line or delivery route, the organization can adjust operations gradually while still seizing the cost-savings opportunity. Moving step by step gives employees a chance to adapt to the new process, and see visible signs of success that builds momentum and preserves morale.

Don't Forget About Pallet User Training

Plastic pallets are assets that the company has invested in. Proper handling will extend the life of the pallet and enable it to be used in your facility for many turns. When planning a pallet program, it is important to:

- Involve users in every step of the pallet selection process
- Solicit feedback from all employees that work with plastic pallets
- Use feedback to make program adjustments
- Document and publish pallet flow
- Document and publish specific pallet handling guidelines (handouts, posters, etc.)
- Determine feedback loop for continuous improvement
- Create process for new employee training

Involve Supply Chain Partners and Share the Savings

Multiple players in the supply chain are affected by a change to plastic pallets. To achieve a smooth transition, it is important that your suppliers and customers understand how the change benefits them. It's reasonable to allow suppliers some economic benefit if they are expected to convert to reusable packaging, and the best way to come to agreement is to share an honest perspective of why the change makes financial sense. Freight and handling charges, reverse logistics, pallet management and tracking are among the issues that should be addressed with suppliers and customers.

Manage Packaging for Long-Term Benefit

Once they implement reusable pallets and reap the immediate benefits, some organizations can become complacent about following the procedures that sustain long-term value from their plastic pallet investment. Collaborating with an experienced reusable packaging provider will ensure long-term success. Leading providers will continue to evaluate your system for additional benefits. For example, they can provide services to track the use of reusable packaging in the operation to ensure that the system is providing the right amount

of packaging to the right supplier or customer locations, at the right time. Or they can coordinate washing or sorting services, oversee any equipment changes and address other issues necessary to manage the program.

Plan Ahead

Consider the plastic pallets in your supply chain equation early in the process. It's important to start planning and pursuing potential supply chain impact as soon as a change is anticipated. Be aware of new pallet footprints or styles that may be needed. Be sure to allow time to test prototypes of the pallets in the supply chain, and to work with and adjust various areas of the plant to facilitate the flow of goods. And, plastic pallets should be tested to ensure they interface with high-speed automated equipment, to ensure ease of use.

Looking to the Future

Update your pallet program as needed – It should be dynamic and respond to changes within the supply chain, including:

- New or upgraded automated equipment
- New or upgraded material handling equipment
- New plant or facility
- New material flow
- New products
- New labor practices
- New production processes
- New supply chain partners

In Conclusion: Pallet Planning for Food Plants

When the entire supply chain is considered, a carefully conceived, well-planned reusable pallet program will eliminate waste, improve cleanliness, optimize inventory management and improve the flow of product. And, with a rapid return on investment (ROI) in 6-12 months, the packaging program can continue to perform and yield cost savings for many years. □

Sources:

1 *"Food Safety: Ode to the Pallet"*, Richard Stier, Food Engineering Magazine, October 1, 2011.

2 *"FSMA: How exactly does it Impact Processing and Packaging Equipment Suppliers?"*, Presented by Jeffrey Barach, May 2, 2012.

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ORBIS Corporation
1055 Corporate Center Drive
Oconomowoc, Wis. 53066