

Plastic Pallets Changing the World

“Plastic or wood?” that is the question many companies are asking along with, “what are the advantages of plastic pallets “. Both have their place with in the manufacturing and shipping industries, so the question then becomes when do we use plastic? The main disadvantage of plastic pallets is that they cost more than wood, but in the right application plastic pallets can be less expensive based on the number of turns per pallet life. Wood is more widely used for all applications and definitely has its place when shipping out on a pallet that will not be returned. Many companies are looking to become greener and are looking to use recyclable or recycled material. There are those that say wood as is recyclable as plastic and they do have a point, but that is totally separate discussion which will not be covered here.

The most common uses are for in-house storage and movement of work in process and finished goods. The other common application is for closed-loop systems, moving products (work – in process), from one plant to another or parts / products that are used in the production system that are made by an outside vendor. Shipping finished products to a distribution center or using plastic pallet to store products in racks until they are ready to ship out, in which the DC will then put the finished products on a slip sheet for shipping. This is more common in the food industry.



Industry Scope:

Plastic pallets are used in many different industries, Automotive, Chemical, Pharmaceutical, Food, General manufacturing and even one-way shipping for exporting products. The AIAG (Automotive Industry Action Group) has established many **guidelines for the automotive industry** to help standardize shipping container sizes for all OEM’s of automotive parts whether they are a tier 1, 2 or 3 supplier. Plastic pallets for the automotive industry are 48” x 45” and can be supplied with or without a seat belt to secure the product. This size, 48x45 are the inside dimensions of the pallet to fit totes that are needed for shipping parts. The toes are also made to the AIAG standards to maximize the space on a truck when shipping product. For more detailed information I recommend going to www.aiag.org.

In the **Pharmaceutical, Chemical and Food industries**, plastic pallets are becoming very popular for several reasons. In many situations when moving raw materials or finished products certain types of companies require pallets made with FDA approved materials. FDA approved materials will be made from virgin plastic to ensure no contamination.

Additionally plastic pallets will not absorb potential contaminants and when they get dirty they can be washed easily, with a power washer or in a pallet washing system. In a pallet washing system you can either wash with plain water or add cleaning fluids if the need calls for it. Plastic pallets are durable and are less likely to break in most situations. The major ways of losing plastic pallets are theft and running over pallets with a fork truck. The nice thing about broken pallets is they can be recycled and used to make other products or used again in plastic pallets that are made from recycled plastic.

Here again plastic pallets are used for closed loop systems or in-house handling of raw materials in the production areas or in storing raw materials in racking in the warehouse.

Plastic pallets have their applications in **general manufacturing** as slave pallets or storing & moving work in process. One of the largest usage for plastic pallets is closed loop systems to move super sacks of products, raw material or even products made at an outside vendor such as plastic or glass packaging or bottles to a production plant to be used or made into a finished product.

Exporting plastic pallets is starting to become more common for several reasons.

Using plastic eliminates the need for heat treating, which is a requirement for shipping wood pallets out of the US. The heat treating eliminates bugs and fungus from growing as long as the pallets are kept dry. Some countries will no longer accept wood so using plastic is the only other option. There are corrugated pallets. There can be an issue with corrugated getting wet as shipping containers are not always water tight. Once in country the pallets can be reused or even sold for scrape ground into re-grind and used in other plastic products or be re-used as pallet material.



Types of application:

Plastic pallets can be used in a variety of applications, Slave Pallets for in-house storage, Closed Loop Systems and as mentioned above exporting of finished goods. In the last section we covered the uses of using plastic pallets for **export or one-way shipping**. Some of the other advantages of plastic pallets being used in one-way shipping are light weight and nestable. Being light weight helps reduce weight load limits on trucks and shipping containers. As for the nestable factor, you get more pallets in a stack thus being able to ship more pallets per truck. For a typical 48x40 wood pallet, you can max out a 53' truck at 630 pallets compared to approximately 1800 pallets for a nestable plastic pallet. This amounts to a cost savings of 2 trucks, by being able to load 3 times as many plastic pallets as compared to wood on one truck.

Additionally there is the reduced environmental impact by using less fuel by reducing the number of trucks needed to move the pallets, thus reducing your carbon footprint on the environment.

Another application is using the plastic pallets as a **Slave Pallet for in-house storage** and movement of products. In the food industry, ingredients may come in on a slip sheet or even in super sacks and will need to be placed on a pallet to store in fixed racking and move raw materials to production areas and even move finished products from the production line to the warehouse to store before shipping.

The storage of parts leads into using plastic pallets for **Closed Loop Systems** has the potential dollar savings in the right situation. Many companies are using plastic pallets to have product shipped to them from their vendors. If the product needs to be stored in fixed racking a heavy duty plastic pallet will have to be used to hold the product in a rack with out deflection of the load. These pallets usually cost anywhere from \$65 to \$100 depending on the need. This is a lot more expensive than wood, but the life span of a heavy duty plastic pallet can out weigh the cost. For products that do not need to be stored in fixed racking a nestable plastic pallet can usually be used and is less expensive, (\$12 - \$30). You can double stack the loaded pallets on the floor and when empty the pallets can be nested, thus being able to store more pallets in a stack vs. wood and in return can ship more pallets on a truck. The ratio of plastic vs. wood can be 2:1 or 3:1 when shipping as truck load of pallets, in turn reducing the freight charges on shipping the pallets. The same applies when shipping out finished goods in a closed loop system. All aspects do need to be looked at to make sure that using plastic is feasible and that the pallets will be returned by the end user. It is also very important to know not only how the manufacturer will be using and handling the pallets on their end as well as how the pallets will be handle by the vendor or customer.

Market Strategy:

Advocating for using plastic pallets.

- **Cleaner environment:** Plastic pallets are recyclable and can be reground and re-compounded for use again as pallets or other plastic products. Nestable pallets i reduce your carbon foot print by 2-3 truck loads compared to wood pallets (630 pallets per truck for standard wood pallet compared to 1200 to 1800 plastic pallets per truck).
- **Ergonomics-** with light weight plastic pallets workers can avoid injuries. A wood pallet weighs around 45-50 lbs where a light weight plastic pallet can weight from 13- 30 lbs. This is less stress on workers backs when having to throw a pallet. Heavier pallets are recommended to use with a fork lift only.

- Returning nestable pallets can save money. Stacking 40-60 pallets per stack versus 21 wood pallets to a stack.
- Plastic pallets are easy to clean. Do not absorb liquids
- Resistant to insects, bacteria and fungi
- Conform to ISPM 15 regulations

Case Study:

Company A, Fortune 500, Personal Care products manufacturer

Situation:

This manufacturer was using used wood pallets for their closed loop system to bring in plastic bottles from their vendor. Take to the production floor and dump into a hopper and then have the boxes and pallets returned to their bottling vendor. Company A is looking to eliminate wood pallets from their closed loop system to avoid product contamination from wood chips.

Object:

The objective as stated is to change over to plastic pallets from wood for the following reasons:

- Plastic pallets will eliminate wood chips in the production areas.
- More turns per pallet life, reducing yearly pallet expense.
- Light weight plastic pallets offer an ergonomic improvement for plant workers, reducing injuries and time off due to injuries, when moving empty pallets, making the work force more productive.
- Recycled plastic pallets offer an environmentally friendly alternative to wood pallets.



Potential Problems and Concerns:

Problems and concerns based on our discussions regarding the test of plastic pallet from Supplier A and from my knowledge of the testing sample pallets from Supplier B.

Supplier A pallet

- Pallet slides on Company A conveyor and runners get stuck under side rollers (only known issue at Company A facility)
- Runners are breaking in two spots after second or third turn. Getting caught on Matrix dock plate.

Supplier B Pallet

- Pallet with runner slides on rollers and got stuck in the conveyor.
- Runners also get stuck under side rollers.

Solution:

The solution was to design a new pallet with 12 legs and have the legs as close as possible to the outside edge. This allows the pallet to make contact with all the boxes and evenly distribute the weight load, when pallets are loaded and double stacked.

The pallet also was designed with a bumper on all 4 sides to make sure the pallets moves properly down the conveyor at Company A. There were no issues with the pallet at either of the bottling vendors.

Pallet was design to handle weights of 1000 - 1200 lbs. In this application the maximum weight load is 700 lbs per pallet. Pallet weight is 20 lbs and easy for line workers to handle and reducing back injuries.

New pallet is being integrated into 4 of the bottle manufacturing facilities.

Conclusion:

Plastic pallets are cost effective and environmentally friendly, particularly for closed loop systems and in house slave pallets. Plastic pallets are very effective in eliminating contamination in production areas and last longer than wood pallets. The plastic is totally recyclable and can be used in making pallets or other products that can be made from recycled plastic. Additionally plastic pallets can be cleaned easily, do not need to be heat treated and do not absorb liquids eliminating contamination to products being shipped on them.