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WHITE PAPER

# MIXED LOAD PALLETIZING: SUPPLY CHAIN ECONOMICS

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# Mixed-Load Palletizing: Supply Chain Economics

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With manufacturing becoming more competitive, the best way for companies to remain viable is by identifying and embracing sustainable technologies that reduce costs and streamline the supply chain. As manufacturers change how they produce and distribute their products, mixed-load pallet building emerges as one of the most efficient technologies companies can embrace.

In general, mixed pallet building (or mixed-load palletizing) is a mindset bringing the manufacturing and distribution environment closer together to review the complete supply-chain process to identify savings in labor, floor space and inventory.

To comprehend this technology, one needs to understand the software advances allowing mixed-load palletizing to become a cost-effective reality. Two general forms of palletizing software exist: software that builds planned pallet loads and software capable of building random pallet loads. The two differ in that planned-pallet load software needs to know the location or identity of the product before it reaches the palletizer, while random-palletizing software can build mixed loads on the fly.



Planned software can build a traditional homogeneous pallet or a rainbow mixed-pallet load where different layers of the pallet are created out of different products. A rainbow-pallet example might involve a pallet built from varying layers of beverages: the base being cola, the next level being diet, and the third, lemon-lime. From the side, the pallet would resemble a rainbow. The benefit of a planned rainbow or homogeneous pallet is the high degree of pallet density. The disadvantage is that rainbow and homogeneous pallets don't allow for the flexibility of building custom pallets to specific customer orders like mixed pallet loads do.

To reap the benefits of mixed-pallet loads, random pallet-building software had to be developed and evolved to a point where it was cost-effective to the company utilizing it. Mixed pallets loads are just that—pallets built of a mixture of products. Random or mixed-pallet-building software permits robots or other flexible palletizing hardware to build pallets of products on the fly as they arrive at the palletizing cell.

Aside from the software variations, hardware differences also exist. Planned pallets can utilize various equipment, from infeed and sortation conveyors to conventional and/or robotic palletizers. With the variety of hardware available, planned-palletizing cells tend to occupy more floor space than random-palletizing cells and often prove less flexible than their mixed-palletizing counterparts. Mixed-palletizing cells generally consist of less equipment, but at least two pieces are needed—an infeed conveyor and a robotic palletizer—both of which utilize less floor space due to the hardware's flexible layout.

Strengths and weaknesses exist in both types of pallet loads. Planned or rainbow pallets will have a high pallet density, meaning they can contain more products. The tradeoff is the great deal of floor space and hardware needed. Mixed-pallet loads, on the other hand, tend to have a lower pallet density due to the diversity of product being stacked. This is offset by the ability to create build-to-order pallets. Build-to-order pallets maximize the flexibility of palletizing by creating pallets of product containing only what the retailer or distributor needs. This reduces your (and your counterpart's) inventory costs down the supply chain.

### Cutting costs

By understanding the pros and cons of these palletizing strategies, it becomes easier to define which works best for you and your manufacturing process.

To illustrate the difference between the two, consider the beverage industry. In the traditional beverage model, drinks are brewed or bottled, packaged and planned- palletized in homogeneous pallets where they're subsequently sent out for distribution. The pallets then are broken down to get the product on a truck for delivery to a store. Traditionally, when the delivery truck arrives at the store, the driver has to travel from bay to bay, building mini-pallets to take inside the store. These multiple "touches" of the product add up to increased labor costs and potential product damage, as well as an inefficient use of floor space to store, stage, pick and re-palletize the product.



The solution to this cost drain is for the manufacturer to work closer with the distributor and, ultimately, the retailer, to build mixed pallets to order with the products the retailer needs at that specific time, date and location.

When all parties involved better understand the end-user's buying demands, they can work together to produce, distribute and ship only what's needed, thereby reducing inventory costs. By initially building mixed-pallet loads, all parties will be able to speed the time of product to market, decrease product touches and reduce labor costs, while also permitting retailers to better utilize floor space.

### Right for you?

Of course, manufacturers need to assess if theirs is the type of operation that would

profit from the mixed load-palletizing model. Generally, companies producing a single or a very small variety of products, or which have limited distribution channels, won't reap the benefits. However, if you produce and/or work through various distribution channels, mixed-load palletizing

would prove a better fit. Still, executives might be under some misconceptions about what's involved in converting to a mixed-load palletizing system, particularly regarding cost and logistics.



As recently as five years ago, cost did pose a barrier. However, with palletizing software becoming more standardized, widely available and implemented, it's conservatively estimated that software costs have dropped between 10% and 15% during the last three to five years. Hardware costs associated with mixed-load palletizing also have dropped, due to the increasing capabilities of robotic palletizers. As the cost of mixed-load palletizing software was decreasing, robotic palletizers were becoming faster with greater ranges and payloads.

Even though several examples of mixed-load palletizing exist in the United States, we can examine the European market for the technology's greatest utilization. Due to the continent's smaller and more diverse geographic areas, Europeans were quick to

embrace mixed-load technology to their advantage. By bringing smaller, more diverse and demand-driven pallet loads to their supply chain, they were able to reduce labor, shipping and floor-space costs. With U.S. manufacturing—especially food and beverage—becoming more regional and demand-driven, it makes sense to utilize the proven technologies and efficiencies seen across the globe.

As with any technology change, skeptics exist. However, with mixed-load palletizing, it is possible for companies to move forward and enjoy the advantages of this process without all the members of their supply chain on-board with the concept. As long as the manufacturers are utilizing mixed pallet loads, efficiencies and cost savings will be enjoyed and will trickle down to other partners in their supply chain.