

Automated Pallet Swap

Problem: The GMA pallets used by most companies today are in very poor condition and can result in a number of problems and issues when products are stored on them in a warehouse. If they are used in an automated system, they need to be checked for quality (i.e. deflection, missing or broken board's etc.). Pallets that fail any of these tests need to be swapped with a new/higher quality pallet. Pallet swapping can be very expensive and will slow down the receiving process..

Most companies utilize GMA pallets and or slip sheets to transport their finished products from production lines to a distribution center for storage. These GMA Pallets are manufactured by hundreds of companies out of all types of wood resulting in a short life cycle and poor quality. If a supplier utilizes slip sheets for product transportation it will need to be placed onto a GMA pallet at the distribution center for storage in rack structure.



TYPICAL GMA PALLET



GMA PALLET WITH SLIP SHEET

Slip sheets are usually comprised of a thin, durable material and are designed to extend outside the standard load envelope on two sides of the pallet so that the slip sheet attachment device can grab the slip sheet. The extension is typically about 4 inches, however, it is common to see the slip sheet extending out as much as 8-10". The extended slip sheet has the potential to cause two very expensive problems in the ASRS system. 1. The system must be designed to handle the overage resulting in a lower cube density. For a large system, this can amount to millions of dollars in additional rack and building costs and 2. Slip sheets that extend past the design limits can cause load profile errors in the ASRS that cost labor dollars to fix.

To eliminate the need to deal with poor pallet quality in Automated Storage Systems, many companies are implementing systems that utilize "Captive Systems Pallets". These pallets can be either a custom manufactured sheet of plywood, commonly called a "Slave Pallet", or a plastic pallet.



PLASTIC PALLET



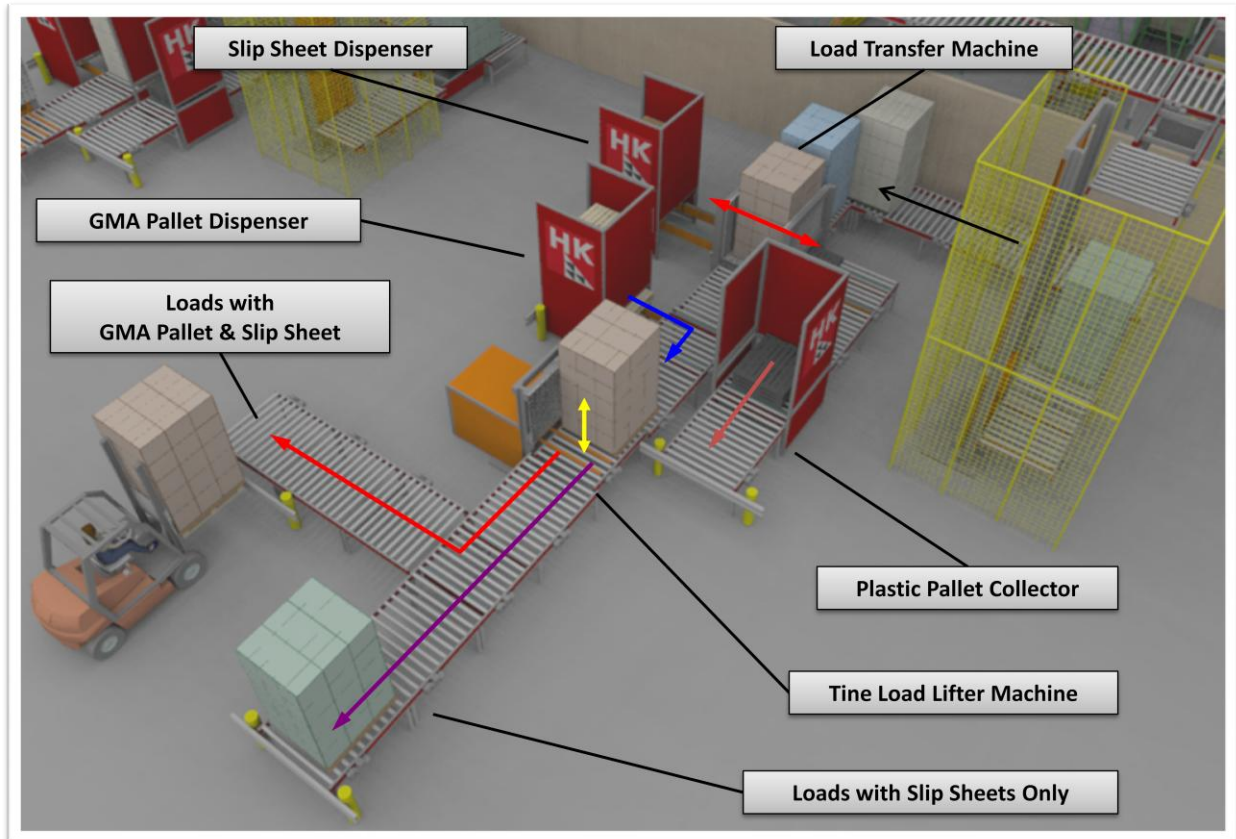
SLAVE PALLET

Product can easily be transferred directly onto these pallets if they are delivered on a slip sheet utilizing HK Systems "load Induction Station". When the product is requested for shipment, they need to be transferred back to a GMA pallet and or a slip sheet.

Solution: Implementation of an automated pallet swap systems that will remove the product from the captive pallet and place it onto either a slip sheet or a GMA pallet, or even place it on a slip sheet and then onto a GMA pallet.

The pallet swap system incorporates the following components:

- Automatic GMA pallet dispenser.
- Automatic captive system pallet collector.
- Slip sheet dispense
- Conveyance
- Device to remove the product from the captive pallet and place it onto a slip sheet
- A tine conveyor section to lift the product on the slip sheet allowing a GMA pallet to be positioned underneath the product.
- Load pickup station of slip sheeted only products
- Load pickup station for GMA palletized product.



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Description of Operation:

- Product is retrieved from the ASRS and delivered to the system
- Slip sheet is dispensed and positioned onto the swap table.
- Swap table moves forward sliding the captive pallet out from under the product and onto the slip sheet.
- Captive pallet is collected and stacked.
- Load is conveyed to the tine station.
- If a GMA pallet is to be inserted under the product, one is dispensed from the GMA pallet dispenser and conveyed to the tine station.
- Tines are raised through the conveyor rollers lifting the product about 6" above the conveyor.
- GMA pallet is conveyed under to the load.
- Tines are move out from under the load depositing the load onto the GMA pallet.
- GMA Palletized load is conveyed to the forklift pickup position.
- If a GMA pallet is not required the slip sheeted load passes through the tine station directly to the forklift pick up position.
- Process repeats for the next load.