



The Value of a High Speed Pallet Dispenser

A Case Study in Ergonomics,
Safety, and Process Improvement

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Executive Summary

Major companies like Procter & Gamble, Johnson & Johnson, Sysco, Kellogg's, Kraft, Nestlé, PepsiCo, and Coca Cola are shifting to the use of pooled rental pallets in response to a trend toward leaner, more rapid distribution and demands from regional warehouses for “aisle friendly” small mixed-product SKUs over single SKU pallets.

This presents a problem for manufacturers and distribution centers in that they now need an efficient way to handle these bulkier, heavier pallets without compromising employee health and safety.

What they need is a high-speed pallet dispenser that can quickly, reliably, and safely deliver individual pallets while minimizing employee contact and operational down-time.

The solution? “No-touch” pallet dispensers from Cherry's Industrial Equipment, an industry leader in pallet handling technology. Cherry's pallet dispensers efficiently store and dispense pallets, allowing for higher pick rates, improved employee safety, and lower overall costs.

Changes Ahead

Manufacturers and grocery distributors have discovered pooled block rental pallets are superior to conventional stringer pallets.

The New Trend: Pooled Rental Pallets

Many companies like Procter & Gamble, Johnson and Johnson, Sysco, Kellogg's, Kraft, Nestlé, PepsiCo, and Coca Cola are shifting to the use of pooled rental pallets by CHEP, PECO, and iGPS for transporting select products from their processing and distribution facilities to supermarkets, club stores, wholesale distributors, and food service operators across the USA.

What these manufacturers and grocery distributors have discovered is that pooled block rental pallets in their supply chain are superior to conventional stringer pallets.

Pooled pallets are much **stronger, safer, and more durable**—designed to hold up to 2800-pound loads in overhead racks (edge-rackable). Increased deck coverage results in less product damage, greater efficiency, improved safety, and significant cost savings. True "four-way entry" construction improves shipping density, easier movements when loading and unloading trailers and reduces freight and handling costs. On average, the total rental costs per pallet are only \$5, which is less than the purchase price of a "GMA #1" wood stringer pallet.

Distribution Centers Face Big Changes

These major companies are shifting toward pooled rental pallets because many large retailers now require "aisle friendly" small mixed-product SKUs over single SKU pallets. This trend toward leaner, more rapid distribution from regional warehouses is forcing manufacturers and distributors to look at pallet cube utilizations, multichannel deliveries, route stop sequencing, and aisle and shelf-ready pallets which bypass the retail storeroom.

The most popular or basic method of mixed case palletization involves multiple pick operators grabbing pallets from short stacks, manually tipping or throwing them down to the ground. Using motorized rider pallet jacks, the operator drives into the pallet, and then travels up and down aisles picking individual cases onto this outbound pallet from bulk product stored in fixed locations on the floor. At some high volume distribution centers this process is repeated as many as 400 times per day until all the pallets are picked for outbound deliveries.

This order picking process is labor-intensive and the most costly activity at any warehouse, accounting for as much as 55% of the total operating expense. Increasing numbers of process improvements have been proposed to help companies with this issue. Many Fortune 100 companies have switched to rental pallets due to customer demand or as a way to offset costs in the supply chain.

Pooled pallets require less on-site inventory and no capital outlays. They cost less than high quality GMA pallets, last longer, and provide a stable shipping platform which prevents product damage.

However, warehouse managers should be aware of the increased weight (65 lbs vs. 50 lbs) of these pallets, which could lead to concerns about warehouse safety, employee morale, pick efficiencies, customer satisfaction levels, and claims due to workplace injuries.

"Most manual handling claims are filed by operations that rely heavily on manual order picking," explains Ted Braun, Product Director, Manufacturing Technology, Liberty Mutual. "This includes **pallet handling** and broken case picking—activities that require a lot of human involvement with workers moving up and down warehouse aisles on powered lift trucks, scanning bins, grasping items, and moving them to pallets."

The direct cost of serious workplace injuries and illness in 2008 was \$53.42 billion.

Ignoring Safety Costs More

According to the 2010 Workplace Safety Index, the direct cost of serious workplace injuries and illness in 2008 was **\$53.42 billion**.

The top five injury causes: "overexertion", "fall on the same level", "bodily reaction", "struck by object", and "fall to lower level" accounted for 71% of 2008's total cost burden. Overexertion (which includes injuries related to lifting, pushing, pulling, holding, carrying, or throwing) maintained its first place rank, costing businesses \$13.4 billion.

Physical Risks

According to a comprehensive study by CAL-OHSA, NIOSH, and the EASE Council, manual material handling tasks may expose workers to physical risk factors. Repeated or continual exposure to one or more of these factors initially may lead to fatigue and discomfort. Over time, injury to the back, shoulders, hands, wrists, or other parts of the body may occur. Injuries may include damage to muscles, tendons, ligaments, nerves, and blood vessels. Injuries of this type are known as musculoskeletal disorders, or **MSDs**.

The main risk factors associated with the development of injuries in manual material handling tasks include: bending, twisting, frequent reaching, carrying, lifting of heavy loads and grasping or contact from loads that are hard or have sharp edges.

The **National Institute of Occupational Safety and Health** (NIOSH) Revised Lifting Equation (1994) provides guidelines for evaluating two-handed manual lifting tasks. It defines a Recommended Weight Limit (RWL) as the weight of the load that nearly all healthy workers can lift over a substantial period of time (e.g., eight hours) without an increased risk of developing lower back pain. The maximum weight to be lifted with two hands, under ideal conditions, is 51 pounds. The RWL is based on six variables that reduce the maximum weight to be lifted to less than 51 pounds. Because block rental pallets weigh 65 lbs, that puts them over the RWL, requiring warehouses and distribution centers to search for palletization solutions that will allow pallet delivery without manually lifting, tipping, throwing or shifting.

Top Ten Causes of Disabling Injuries (2008)

\$ Billions	
Over Exertion ¹	\$13.40 25.1%
Fall Same Level	\$8.37 15.7%
Bodily Reaction ²	\$5.40 10.1%
Struck by Object ³	\$5.36 10.0%
Fall lower level	\$5.29 9.9%
Highway Incident	\$2.32 4.3%
Caught In/ Compressed by	\$2.25 4.2%
Struck against object ⁴	\$2.25 4.2%
Repetitive motion ⁵	\$1.83 3.4%
Assault/Violent acts	\$0.60 1.1%

¹Overexertion - i.e., excessive lifting, pushing, pulling, holding, carrying or throwing; ²Bodily reaction - e.g., bending, climbing, reaching, standing, sitting, slipping or tripping without falling; ³Struck by object - e.g., a tool falling on a worker from above; ⁴Struck against object - e.g., a worker walking into a door; ⁵Repetitive Motion - i.e., repeated stress or strain.

Case Study

The Problem

One large snack food company was looking to change the way they handled their product in their supply chain. Previously, cases were order picked onto to a flexible conveyor, which extended into the delivery truck. Inside the truck, another employee removed each case from the flexible conveyor and placed it directly on the floor. This type of case picking is fast and generally very efficient; however the flexible conveyor expands and telescopes, creating a severe pinch point which presents real safety concerns.

This company needed to implement a new order picking process with a short ramp up schedule, but with employee safety in mind. Fully-automatic and semiautomatic case picking solutions were reviewed. These systems could lower labor costs and minimize employee touches, but are offset by long lead times, ramp up schedules and a large investment of capital.

For capital outlay, timing and continuation of delivery service, the best choice was basic order picking (picking directly to a pallet). Once this process was selected, the next decision was which type of pallet to use.

White Wood Stringer Pallets vs. Block Rental Pallets

“White wood” is the nickname for a general exchange, non-rental pallet that is widely used in a variety of industries around the world. The dominant footprint size in the U.S. for consumer goods is 48” x 40”.

These pallets are manufactured from softwoods or hardwoods and available at different construction levels (GMA #1 and GMA #2). However, many pallet manufacturers no longer adhere to a true GMA spec and there is now a lot of inconsistency in what is being sold as a true GMA #1 pallet.

Also consider that many retailers prefer in-store deliveries with aisle and shelf-ready block style pallets, which have full four-way access, allowing associates to pick up a loaded pallet with a traditional pallet jack. A stringer pallet has limited four-way access requiring forklift use, or special low-profile pallet jacks.

In the case of storeroom retail deliveries, pallet exchange can be an issue in the pallet purchase decision. Simply put, as the product is delivered on pallets, empty pallets are exchanged for the pallets under the load. Receiving docks are expected to have empty pallets of like design in good condition readily available for the truck driver to take, which the driver can then exchange when he picks up his next palletized shipment.

Anyone who has experience with pallet exchange knows that this process is difficult to administer, and can create an adversarial environment that strains relationships between trading partners when the exchange is not equivalent. The use of rental pallets eliminates these concerns.

So how did this business take advantage of the benefits of using pooled rental pallets, but also manage the associated risks?

Advantages of Pooled Rental Pallets over Stringer Pallets

- stronger
- more durable
- last longer
- safer
- prevent product damage
- allow full four-way access
- less on-site inventory
- no capital overlays
- lower cost
- easier to exchange

Take advantage of the benefits of using pooled rental pallets, while managing the associated risks.

The Solution: High-Speed, Ground-Level Pallet Dispensers

With the decision to convert to order picking and the use of pooled rental pallets, this company realized the need for high speed, ground level pallet dispensers, and turned to Cherry's Industrial for guidance.

Cherry's Industrial Equipment, an industry leader in pallet handling technology, has been solving pallet handling problems for over 30 years in the pharmaceutical, food, and printing industries, including production plants, warehouses, and distribution centers.

We offer the most complete line of dispensers including: gantry style for overhead dispensing, an entry level unit that dispenses and accumulates, conveyor fed systems for robotic work cells, and high speed ground-level dispensers.

For this particular customer, the pallet dispenser needed to meet very stringent requirements: "no-touch" handling of pallets up to 400 times per day, floor-level pallet retrieval, quick cycle times, reliable operation with minimum down time, physical space, and employee use and acceptance without compromising employee safety.

No-Touch Pallet Dispensing

The PD-4500 single-deep pallet dispenser holds 40-45 pallets and dispenses a single pallet to the ground every 8-10 seconds.

The PD-9000 double-deep pallet dispenser holds 80-90 pallets and dispenses two pallets to the ground every 8-10 seconds.

Both units are fully automatic, allowing a pick operator to drive in with a manual, electric, or rider pallet truck and pick up the pallet that's on the ground. As he backs away, sensors detect that the pallet has been removed. A unique squeeze mechanism holds the stack above while lowering angles support the single pallet, then gently drop it to the ground. A "hard reset" is needed only after forklift pallet replenishment or at the beginning of the shift.

Reliable Operation with Minimum Down Time

Many outside warehouses and distribution centers have limited access to tools and maintenance staff, so we designed our equipment with this in mind. We've incorporated features like quick disconnect sensing devices, self-lubricating wear pads and bushings, automatic greasers, and an HMI with diagnostic screens.

All types and brands of pallet dispensers eventually "trip up" or "jam" —even ours. So to maximize up-time, the pallet stack is aligned when loaded into the machine, and again as the stack is lowered through guides before dispensing. For severe cases, an external pallet wedge allows operators to square the pallets before putting them into the dispenser. Additionally, our dispensers feature squeeze plates that grip the stack and can handle bad or co-mingled block and rental pallets.

But it all starts with professional installation, startup, and training from Cherry's Industrial or one of our 200 contracted authorized service technicians across the country.



PD-4500 Pallet Dispenser



PD-9000 Pallet Dispenser

Each unit is test-cycled and calibrated before shipping and then again after installation. It's not uncommon for our customers to operate the machines 24/7, going through 200-300 pallets per shift. These robust, heavy-duty units are designed to handle that sort of volume consistently.

Pallet Dispenser Units

PD-4500

- 6'W x 8'D x 20'H (4 stacks of pallets)
- holds 40-45 pallets
- dispenses a single pallet
- pallet truck with 48" forks

PD-9000

- 6'W x 16'D x 24'H (8 stacks of pallets)
- holds 80-90 pallets
- dispenses two pallets
- pallet truck with 96" long forks

Physical Space

At a distribution center where products are floor-loaded, every inch of that floor space is crucial, so the size of the machine is a primary concern. Most companies consider three critical factors when deciding between model PD-4500 and PD-9000: the size of the facility, the number of pallets they're picking, and the compatibility with the pallet moving equipment.

The single-deep PD-4500 operates in an area 6'W x 8'D x 20'H equivalent to 4 stacks of pallets, while the double-deep PD-9000 operates in an area 6'W x 16'D x 24'H equivalent to 8 stacks of pallets.

The models differ in overall size and pallet capacity, but the deciding factor is usually the pallet truck type. A standard rider electric pallet truck with 48" forks works with the PD-4500 which dispenses one pallet at a time, while a double-deep pallet truck with 96" long forks works with the PD-9000, which dispenses two pallets at a time.

Operator Use and Acceptance

"We are creatures of habit. We find comfort in regularity. When something out of the ordinary comes along, it forces us to dig deep and make a U-Turn instead of keep going straight, it's jarring. All of a sudden the comfort and familiarity are gone and we're alone—not quite sure what to do next" *James Gordon, M.D.*

We know that change is tough, so it's important to train the operators over an entire shift. This in-depth training creates confidence and an understanding of how this is a much safer process than manually lifting the pallets. Often, even the employees who were initially most hesitant to use this type of equipment immediately see the benefit after just one shift.

At one customer location, each trained operator signed the pallet dispenser at the end of the first shift. This distribution manager told the operators "it's all about productivity—the more cases you pick, the more money you earn." He added, "Look, next week when you open up your paychecks and see more money, you can thank the Pallet Dispenser for that." He suggested that they give it a big hug, since it would be their new best friend.

Employee Safety

Safety is a top priority for this customer, so they require a documented risk assessment from the machine builder on any proposed equipment.

A risk assessment includes hazard and level of harm identifications, as well as best possible ways to mitigate risks. Potential hazards on the dispenser included pinch-points, pallets tipping out of the machine, arc flash, electrical panel build standards, idle pallet storage as a fire hazard, and automatic operation with personnel in the work zone. Most of these potential hazards were already addressed in our standard equipment package, including UL 508 certified panels (which meet the highest electrical codes), swing gate with a safety switch to contain the pallets in the towers, and warning and caution labels noting pinch points and arc flash dangers.

Employees hesitant to use this type of equipment immediately saw the benefit after just one shift.

Improving Employee Safety in the Warehouse

- sprinkler systems for fire-safety
- crash guards to protect machines
- safety scanners for automatic machine operator protection
- UL certified panels
- swing gates for pallet containment
- warning and caution labels

Additional risks to be addressed were fire safety, machine guarding, and perimeter guarding or safety devices that would protect operators during automatic operation without affecting machine performance. To improve fire safety, we recommended the installation of a sprinkler system above the unit. We sell optional heavy-duty crash guards that can be strategically placed around the machine to protect it from forklift traffic.

To protect the employee during automatic operation while in the work zone, we used a system consisting of a Class 4 safety laser scanner, programmable safety relay, and EN954 rated electrical panel. A safety scanner sends out beams on a horizontal plane and senses any object within a determined area. For this application, we mounted the scanner on the front of the machine facing outward with two programmed zones: a safe zone and a stop zone. With the addition of the programmable safety relay, we could program in safe conditions to allow for an auto-reset. The operator is protected as the machine automatically stops when he approaches from the safe zone into the stop zone. Then once he removes the pallet and backs up into the safe zone, the machine operates automatically again. There was no need to go through the cycle of having the operator pressing a reset and start button every time he drove in. This saved them about 3-5 seconds per cycle, which adds up to huge time savings over 200-300 pallets.

Results

Multiple pallet dispenser units have been in operation for over a year, and are handling up to 400 pallets per day with minimal maintenance. The steady up-time has allowed the company to continue their no-touch policy, which prevents a pick operator from manually handling a wood pallet.

The snack food distribution facilities using either the PD-4500 or the PD-9000 Pallet Dispensers are achieving higher pick rates than their other facilities. Reviews from the warehouse and safety managers speak of immediate productivity gains, better employee morale, a reduction in workplace injuries, cleaner warehouses without wood chips, and the elimination of heavy pallet lifting.

As an added benefit, the use of the dispenser decreased employee turnover and improved hiring options. New warehouse selectors are hired based on their ability to safely drive a rider electric pallet truck and pick orders accurately using headset technology. Strength and stamina are still needed to pick cases but to a lesser extent since the employee no longer needs to get off his pallet truck to lift the pallets down to the ground.

Several other companies with similar needs have turned to Cherry's Industrial for high-speed ground level pallet dispensers.

Successful installations and implementation at Coca Cola and Container World use multiple PD-4500 dispensers at facilities in Canada to help warehouse selectors pick cases of soft drinks and beverages onto heavy wood CPC pallets.

Publix Grocery chain uses a PD-9000 dispenser at their Deerfield Beach, Florida distribution center to handle black plastic iGPS rental pallets in the picking operation for perishables. One machine handles roughly 600-700 pallets a day requiring 80 empty pallets to be reloaded about every 30 minutes. Real-world testing continues at this pilot facility with positive results gathered from time studies, reliability tests and increased worker acceptance. There are plans to add additional units to other departments and rollout out dispensers to all regional distribution centers.

The snack food distribution facilities using our Pallet Dispensers are achieving higher pick rates than their other facilities.

Conclusion

Benefits of a “No-Touch” Pallet Dispenser

- higher pick rates— up to 400 pallets a day
- increased productivity
- better employee morale
- reduced workplace injuries
- cleaner warehouses
- no more heavy pallet lifting
- less employee turnover
- improved hiring options

High-speed pallet dispensers from Cherry’s Industrial Equipment’s offer an efficient, reliable, and safe solution to the increased demand for rapid pallet distribution.

Warehouses and distribution centers that need to quickly, effectively, and safely manage pallet distribution should look to Cherry’s pallet dispensers to increase productivity, improve employee safety, and lower costs.

For more information or to order visit palletdispenser.com

About the Company

Cherry's Industrial Equipment

Cherry's was originally founded in 1982 to market the pallet inverter, a new piece of material-handling equipment developed to turn entire pallet loads over to safely recover and replace damaged products. This little "niche" product soon became a must-have for all material handlers. Our Cherry's-brand inverters now handle hundreds of products every day, from Campbell's soup to lottery tickets, from ATM machines to cosmetics.

Our passion is to create lasting solutions to the problems of the pallet industry: repetitive motion injuries, back strain, fatigue, and other incidents resulting in harm to employees, expensive workmen's compensation claims, and lost hours. The success of our pallet inverter allowed us to expand our product line to offer additional pallet handling equipment and supplies, with dozens of different models and custom designs—all geared toward reducing risk in the manufacturing and warehouse industries, increasing safety, and saving valuable time.

All Cherry's-brand products are manufactured and assembled in the U.S.—not a single part is outsourced. Years ago, we made the conscious decision to bring all of our processes back home because we believe in upholding the highest standard of quality, respecting American jobs, and deliberately not contributing to human rights abuses and environmentally-unsafe practices in other parts of the world.

For more information, visit cherrysind.com



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