

Cubic Designs Inc.
CUSTOM MEZZANINE SYSTEMS

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ACHIEVE NEW BALANCE

By David Maloney, Senior Editor
Modern Materials Handling
October 1, 2001

This sports shoe company slashes the distance between the suppliers and its new automated distribution center. It hits the tape a winner.

In the world of sports, every step an athlete takes must be efficient in order to finish first.

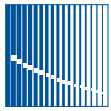
That also carries over to the companies that make the shoes and sportswear worn by champions. Eliminating unneeded steps is the key to creating winning distribution capabilities.

Such is the case with Boston-based New Balance. You might even say that this company's new Ontario, Calif. shoe distribution center shot out of the blocks early and has never looked back.

Open since only January, the facility is designed to process 20 million pairs of shoes annually. Its California location is situated much closer to Asian suppliers than its other DC in Lawrence, Mass. (see MMH-February, 1999). When you consider that more than half of the company's shoes are manufactured overseas, it is easy to see how important it is to eliminate thousands of additional miles in transportation costs. Other steps have also been saved by now being closer to New Balance's West Coast customers, allowing many to restock the shoes on their shelves within 24 hours.

The new center was necessitated by New Balance's tremendous growth rate the past 5 years and its emergence as a top sports supplier. The half-million square foot building footprint provides for plenty of growth, while sporting one of the world's largest picking mezzanines (Cubic Designs, www.cubicdesigns.com). Currently 350,000 square feet are being used, plus an additional 72,000 square feet in the two-level mezzanine. That still leaves plenty of room for future expansion.

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New Balance p2

Unlike most sports shoe companies, New Balance sells shoes in specific widths from AA to EEEE. Such a range requires a large number of stock keeping units (SKUs) and extensive materials handling equipment to process orders quickly.

"This facility is highly automated," says Rick Thorn, distribution engineering manager. "We have a commitment to serve both large and small customer orders efficiently from here."

The Ontario DC features a tilt tray sorter, a very efficient sliding shoe sorter that serves multiple functions, 5 miles of conveyors, a large broken case picking area on the mezzanine, and an efficient value-added services area.

In a twist from most DCs, New Balance leases the building, owns the equipment and stock within it, but hires a third-party provider, California Cartage, to manage the facility and supply the labor force.

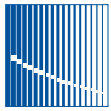
Prior to the new center's opening, New Balance had been a client for several years at Cal Cartage's DC in Compton. That facility now distributes New Balance's line of sportswear. "This partnership has worked well," says Thorn. "We look at Cal Cartage as almost a part of New Balance. They know our business and what our customers want."

No Business Like Shoe Business

Accumulating powered extenders aid unloading of inbound cartons at the facility's receiving docks. Items are processed at four receiving stations where the vendor-supplied bar code on each receipt is scanned into the warehouse management system (WMS).

Cartons are then placed on a conveyor where they are weighed on the fly. Eventually the results will be compared with the expected weight for that SKU to determine if any items are missing from the carton. Receipts also pass a fixed scanner that reads the bar code just prior to entering the main sorter.

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New Balance p3

This sliding shoe sorter serves several functions, including receiving, feeding the pick modules and tilt tray system, and shipping sortation. It is not uncommon for a carton to pass through it several times during its stay within the facility.

On this initial pass through the sorter, cartons are diverted to one of four primary areas – quality assurance, two separate pallet build areas, or to the picking mezzanine. Cartons sent to the quality assurance area are opened and inspected before being sent on to their storage locations.

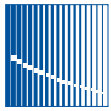
Fifteen or more cartons of the same SKU go to a manual pallet build area. From here they are gathered by either a turret truck or an orderpicker and placed into high bay storage racks. The driver chooses a storage location then uses the scanner on a vehicle-mounted terminal to scan the carton ID and location bar code upon putaway. These will later be picked as full pallet loads.

Less-than-pallet-load cartons are diverted from the sorter to other pallet build lanes. Mixed SKUs are placed on these pallets based on pick activity. These are then taken by orderpickers to decked shelving for individual putaway.

SKUs needed immediately to replenish the forward pick locations are diverted from the primary sorter directly to the picking mezzanine. The cartons travel first to the upper level where faster moving SKUs are stored in flow racks with a capacity of 60 pairs of shoes per location. Lower-velocity SKUs are conveyed to the lower level of the mezzanine where they are diverted to storage in static shelving, with 24 pairs per location.

Riding The Waves

Orders drop twice daily from New Balance's headquarters. Five to eight fulfillment waves are generated with each containing 3-4,000 pairs of shoes. The first to run is the quick response wave consisting of orders that will be delivered to stores within 24 hours. The other waves follow based on SKU, customer, and delivery method.



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Whenever possible, New Balance processes full pallets of products, which bypasses the pick mezzanine. Many of its customers are large retailers that receive a full pallet or a number of cases of a particular SKU. The pallet load may also be split among several customers who together account for all of the shoes on the pallet. Full pallets make up about one-third of all orders processed during a typical day. They are pulled as directed by the RF system from high bay storage and taken to a print and apply area. Here cartons are scanned and given a shipping label. They are then conveyed directly to the outbound docks.

"The goal is to get as many full case picks of SKUs from the high bay storage within a wave as possible," says Thorn.

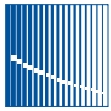
The remaining two-thirds of orders consist of full case, but less-than-a-pallet picks (about 75%) and split case selections (25%). Full cases, but less-than-a-pallet, are processed in three ways. Some will ship as full cases, others are cases that will be broken into several orders and sorted by the tilt tray, while the remainder replenishes the broken-case pick areas in the mezzanines.

"We have on-demand replenishment," notes Thorn. "While we are picking the waves for orders we are also picking replenishment cartons at the same time.

"The selected cases are pulled from the high bay and carton shelf storage areas using orderpickers as directed by the on-board RF systems. Workers scan the carton IDs to confirm their selections. The cases are then placed onto a conveyor adjacent to the racks which carries them to the main sorter. Replenishment cartons are diverted to the back of the mezzanines in the same way as new receipts were processed. Cartons to be split are fed to the tilt tray system for further sorting, while SKUs that will ship as full cases are diverted to the print and apply area for labeling.

After the shipping label is attached to these full cases, 75% of them are conveyed to the main sorter and directed immediately to the outbound docks. The remaining cartons stop briefly at a value added

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(VA) area. Each carton is opened here and the service performed. Price ticketing is the most common service offered at the 12 VA stations, while other tasks include special tagging, adding brochures, and taping each shoe box.

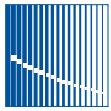
Once completed, the cartons of shoes pass through a carton sealer and are then conveyed once more back to the main sorter where the sliding shoes divert them to the 40 shipping docks. Three of the lanes have powered extenders to aid in loading trucks.

Less-than-case picks are pulled from the flow racks and static shelving of the mezzanine. Radio frequency devices display the SKUs of shoes and the quantity of each required. These boxes of shoes are then placed into totes. The worker scans both the SKU and the tote ID to marry them together. The tote is next placed on a takeaway conveyor that winds through the two levels of the mezzanine.

Tilt Tray Sorting

Many of the full cases pulled from the storage racks during the wave picks are destined for broken case orders. These are conveyed back to the main sorter for diversion to the five induction stations of the tilt tray system. Totes from the mezzanine are also diverted to induction. The cases and totes are opened upon arrival and each box of shoes is manually placed on the trays as they glide by. The system can sort up to 9,000 pairs of shoes an hour.

Each shoebox contains a bar code that is read by a fixed scanner upon induction. The WMS dynamically determines into which of the 360 double-layered chutes to discharge the box. Depending on the size of the order, several chutes may be used to accumulate the shoes required. They are assigned according to the number that can fit into an outbound carton. An LED display at the chute tells how many shoes will accumulate from 1-12 pairs based on shoe size and quantity ordered by the customer. The packer selects the proper size of carton and scans its license plate. The worker also scans the chute ID and immediately a list of SKUs assigned for that carton appears on their RF display as confirmation.



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A blinking light on the chute indicates that all items have been properly accumulated and that the carton does not need to go to the value added area. In this instance, the worker seals the carton and places it on a takeaway conveyor where it next passes to print and apply. It then is conveyed back up to the main sorter where it is again weighed for manifest purposes, scanned, and sorted to shipping.

If the light on the chute is solid and not blinking, it indicates that the carton requires a value added service and should not be sealed. These are conveyed to print and apply, then passed to processing in the value added area. When value add is completed, the cartons are sealed, sorted by the sliding shoe sorter, and sent to the proper shipping lane.

New Balance also ships about 200 single-pair orders per wave. These consist of special-order items or small quantities of SKUs designed to replenish the stock of a particular store. Four chutes of the tilt tray sorter accumulate these items. They are packed into single-pair cartons at the chutes.

The Ontario facility has operated well since going online in January.

"We have had times when we have had 30-35,000 pairs and have been able to process them in one day. It is exactly what we expected," says Thorn.

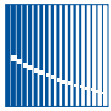
System Snapshot

New Balance

Distribution Center, Ontario, Calif.

Began operation: January, 2001

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Facility size: 350,000 square feet, plus 72,000 square-foot mezzanine (Additional 150,000 square feet is currently used by 3PL)

Employees: 100

Throughput: 35,000 pairs per day, design capacity of 20 million per year

SKUs: 15,000

Mezzanine: Cubic Designs, Inc., 800-826-7061, www.cubicdesigns.com

Conveyors and sliding shoe sorter: Siemens Dematic Material Handling Automation Division (Rapistan), 877-725-7500, www.rapistan.com

Expandable conveyors: Best Diversified Products, 800-327-9209, www.bestconveyors.com

Tilt tray sorter: Mantissa Corp., 704-525-1749, www.mantissacorporation.com

Lift trucks and order pickers: Raymond Corp., 800-235-7200, www.raymondcorp.com

Storage racks: Global Storage Systems, 800-655-7225, www.globalrack.com

Dock seals and levelers: Serco Co., 877-408-6788, www.sercocompany.com

Warehouse management system: Swisslog Software USA, 800-783-9840, www.swisslog.com

RF scanners: Teklogix, 606-371-6006, www.teklogix.com

Fixed scanners: Accu-Sort Systems, 800-227-2633, www.accusort.com

Labeling machines: Fox IV Technologies, 412-826-5600, www.foxiv.com

Printers: Intermec Technologies Corp., 425-348-2600, www.intermec.com

In-line scales: Mettler-Toledo, 614-438-4511, www.na.mt.com

Totes: Buckhorn, Inc., 800-543-4454, www.buckhorninc.com

Architect: Hill Pinckert Architects, 949-863-1770, www.hparchs.com