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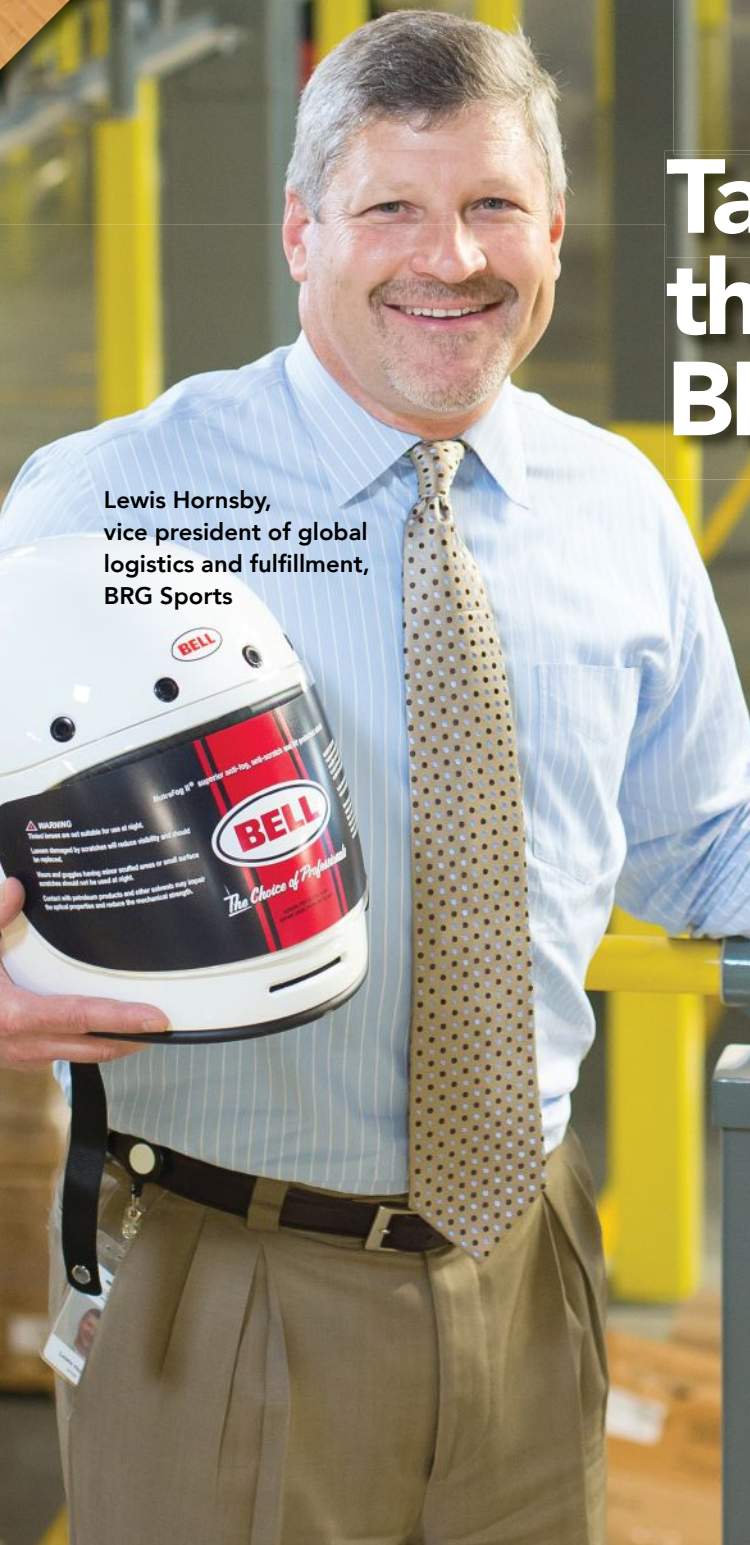
Taking out the touches at BRG Sports 18



Lewis Hornsby, vice president of global logistics and fulfillment, BRG Sports

READER SURVEY

How pallet trends stack up **28**

+ Webcast: Annual Pallet Report
Wednesday, Oct. 15 at 2:00 p.m. ET
mmh.com/pallets2014

EQUIPMENT REPORT

Sizing an opportunity **34**

INFORMATION MANAGEMENT

Print-and-apply meets demands of e-commerce **40**

SPECIAL REPORT

Top 20 automatic data capture suppliers **46**

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Taking out the BRG Sports

BRG Sports' new DC was designed from the ground up as an omni-channel, omni-brand distribution and manufacturing facility. Most of all, the materials handling solution optimizes fulfillment and takes touches out of the process.

By Bob Trebilcock, Executive Editor

Let's face it: Distribution has never been more complicated. The best retailers and distributors want to fill orders across multiple channels, multiple brands and a multitude of order profiles, all from one facility. Meeting those requirements with conventional materials handling processes often results in more touches that add waste, time and cost to the order fulfillment processes.

Taking those touches out of the process was one of the guiding principles behind the design of BRG Sports' new 813,000-square-foot manufacturing and distribution facility in Rantoul, Ill. The acronym stands for Bell, Riddell and Giro, three of the best-known names in sports helmets and accessories. Riddell, for example, is the leader in football helmet technology. Last spring, BRG Sports expanded its portfolio with the acquisition of C-Preme, a manufacturer of action sports helmets for children, teens and adults.

The facility, which went live in October 2013, is a complex environment. When the integration is complete, BRG Sports will have consolidated eight different distribution centers and four brands into one facility. Currently, BRG Sports is managing 23,000 SKUs while shipping an estimated 10,000 pallets a month. Its customer base includes big box retailers

Lewis Hornsby, vice president of global logistics and fulfillment.

touches at

Photography by Peter Wynn Thompson/Getty Images

that may receive full truckloads with up to 10,000 cartons and smaller specialty retailers and organizations, such as professional sports teams and school athletic departments, which may order a handful of mixed cartons. Some orders are palletized and others are floor loaded.

While full pallet orders represent 70% of the volume, the number of e-commerce orders for parcel delivery is doubling every year. In addition to distribution, the facility includes a manufacturing operation that can produce 25,000 Bell helmets per week.

To manage that complexity, BRG Sports worked with a systems integrator (Numina Group, numinagroup.com), to design and build a Greenfield facility to minimize those touches that uses:

- very narrow aisle storage to optimize space;
- hands-free, multi-modal data collection tools to direct picking activities (voice and ring scanning); and
- automated materials handling equipment (conveyors, sortation, and automated print-and-apply and packing systems).

The facility features 44,000 pallet locations, expandable to 60,000 locations; 2 miles of conveyor; and systems that can support 60 cartons per minute in mixed full-case order shipments and 100 cartons per minute in the combined full case/split case modules.

Workers assemble Bell helmets at the facility. In the future, helmets will be produced and shipped according to real-time demand.

The solution is tied together by a warehouse control system (WCS) that enables parallel pick, pack and ship operations across brands, channels and order profiles. The WCS times the release of work and synchronizes activities so the right cartons for an order arrive at the right shipping area at the right time and with the least amount of travel—and touches—by associates.

A modern warehouse control system (WCS) and voice technology synchronizes pick and pack activities across multiple sales channels and order profiles.

Building a Greenfield facility meant that BRG Sports could design new processes from scratch. "We didn't want to automate our existing processes," says Lewis Hornsby, vice president of global logistics and fulfillment. "Instead, we wanted to use automation to streamline our processes." While there is still some manual handling, about 80% of the orders go through the automation. "Although we ship multiple brands in split and full cases, to the automation, an order is an order and a box is a box," Hornsby says.

While BRG Sports took a phased approach to integration, consolidating one DC at a time, Hornsby is already seeing a significant improvement in throughput. "We think it'll take a year after we complete the last integration to see the full benefits, but we're moving in the right direction," he says.

Network design led the way

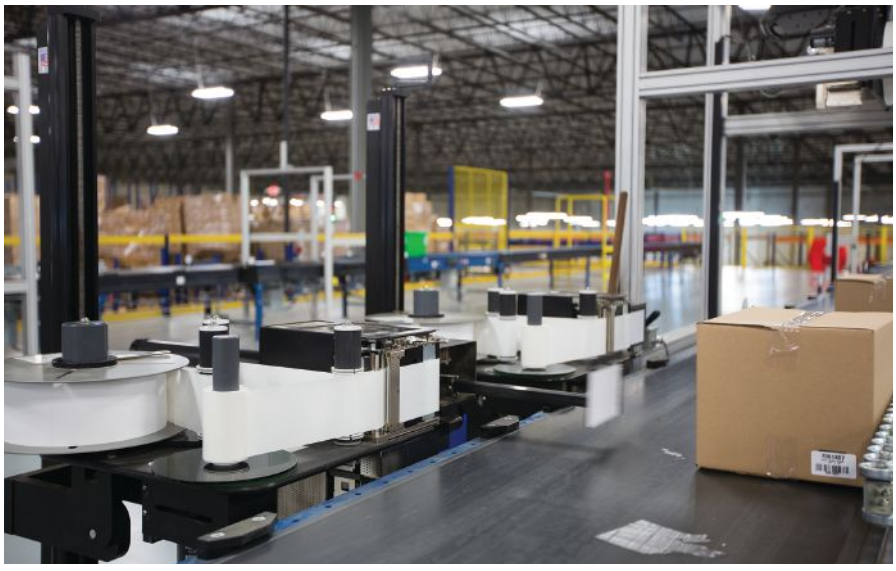
Headquartered in Scotts Valley, Calif., and with more than $825 million in

revenue in 2012, BRG Sports is a leading designer, developer and marketer of sport equipment and accessories. Formerly known as Easton-Bell Sports, the corporate name was changed last summer following the sale of the Easton businesses—baseball/softball, ice hockey and cycling. Today, BRG Sports focuses on sports helmets, protective equipment and accessories that support the bicycle and football businesses.

The project was initiated in August 2010, when Hornsby and his team began researching the feasibility of a new facility. At that time, each of the brands had its own unique supply chain. In all, there were seven distribution centers prior to the acquisition of C-Preme. "We had duplicate processes, and we frequently had to prepare multiple shipments from different DCs to fill orders to a big box retailer who ordered from more than one brand," says Hornsby. "What our customers really wanted was to place one order and get one shipment from one facility."

Hornsby laid out three goals for the new facility. No. 1 was customer service: The facility had to reach most of the United States in two to three days. No. 2 was to eliminate duplicate processes in multiple facilities to fill one order. Finally, the facility had to pay for itself.

Since many big box retailers arrange their own transportation and pay their own freight, finding a location that met BRG Sports' needs without adding to its customers' supply chain costs was paramount. "We did a lot of analysis on the miles our customers traveled, the amount of lead time required from the time an order is placed until pick up and the costs associated with pick up at our old facilities," Hornsby says. He adds that in addition to in-house analysis, his team also worked with a consulting firm on network analysis and site selection.



Automated print-and-apply technology has replaced the manual labeling processes that were used in the old facilities.

At the end of that process, BRG Sports chose Rantoul, Ill., where the company has operated manufacturing and distribution operations for more than 30 years. "We were able to meet our transportation and customer service requirements and retain key employees to help us transition the operations in a phased move," Hornsby says.

Bringing in automation

With a location set, the next step was to design a facility where automation is

New merchandise is processed in the receiving area and then delivered to a staging area for putaway in the very narrow aisle storage area.

used to streamline and optimize labor intensive, manual processes.

In the existing facilities, lift trucks and wireless bar code scanning were the dominant technologies. Full cases were picked to pallets and delivered to staging areas. There, they were re-palletized into mixed pallet orders for individual retailers. Shipping and retailer compliance labels were applied by hand. When trailers arrived, the pallets were broken down again and the cartons were floor loaded for delivery.

Split case orders were picked to totes and delivered by lift trucks to the packing area where they were separated into LTL and parcel shipments. Parcel orders traveled by conveyor to a shipping station; however, they were weighed and labeled by hand.

What's more, associates spent a considerable part of their day walking to pick locations. With the growth of business, especially e-commerce orders, "we needed a leaner, faster process to meet the continued parcel shipment growth," Hornsby says. "We wanted a solution that could give us two- to three-times more efficiency, minimize wasted labor and increase lines per picker."

The order fulfillment system does that by bringing together automated materials handling systems and hands-free data capture technologies to enable parallel pick, pack and ship processes; that means the system allows the facility to simultaneously pick full case, split case and e-commerce orders. As Hornsby says: A box is just a box to the automation.

There are four distinct picking areas.

1. One is represented by two, three-level split case pick modules with 3,024 carton flow positions and 237 two-deep case pick pallet flow pick positions. In the split case area, picking is done on the first two levels. Pack stations and automatic weighing and print-and-apply technology is located on the third level.

2. A second area is a three-level full case pick module with 1,131 carton flow positions and 260 two-deep pallet flow pick positions. This area represents more than half of the orders processed in the facility. In this module, picking takes place on all three levels; the full case pick module is connected by conveyor to the third level of the split case module. In that way, full cases are transported to the split case module where they are automatically weighed and labeled for shipping, inducted into the shipping sorter and diverted to the right shipping lane. In the new facility, floor-loaded cartons are conveyed directly into a trailer for fluid loading.

Picking activities in both of these modules are directed by voice recognition technology that selects the carton, and directs and confirms picking by either hands-free scanning with ring scanners or by voice.

3. Slow-moving items, some hot items and non-conveyables are picked to carts from the reserve storage area and are directed by voice. To cut down on walking, the carts are designed so an order selector can use the forklifts to transport the carts and reach both floor and upper rack pick locations, rather than manually push the cart. Picking in these areas is also directed by voice. Once all of the picks to a cart have been completed, the items are inducted into the automation system, and conveyed to the third level of the split-case module for packing, weighing and labeling.

4. Finally, an exception processing area located on the third level manages incomplete orders or those requiring a quality check or value-added services, such as price ticketing.

Regardless of where they are picked, once orders leave the packing and labeling area, they pass through a scan tunnel and enter a narrow belt shipping sorter located above the dock, which sorts them to the right shipping area for full trailer loads, LTL shipments or parcel shipments.

Multi-modal voice and scanning technology has delivered significant quality improvements. "Our error rate is less than one half of 1%," says Hornsby. "That's not just mis-

The facility features full case and split case picking modules. Packing takes place on the third level of the split case module.

picks, but damage from shipping or a shipping label that can't be read." But the real benefit comes from the use of the warehouse control system to direct activities. The logic in the WCS analyzes a batch of orders and determines the correct start times to synchronize processes in the different modules.

For instance, the WCS may initiate picks in the reserve storage area first because those take longer to process. Similarly, the WCS can distinguish between full truckload and LTL orders, and segregate split case orders that may require more time than full case orders. The system then synchronizes the delivery times so that full case and split case orders arrive at the palletizing area at the same time. In all instances, the double and triple handling that was common in the old processes has now been automated out of the operation.

Lessons learned

When the facility went live in October 2013, BRG Sports staggered the closing of facilities, integrating them one at a time. The goal was to minimize the risk of a glitch from trying to do too much at one time. At the same time, Hornsby believes that approach delayed BRG Sports' ability to realize the full benefits of automation. "We had a significant number of people doing manual processes while we spoon-fed the automation," Hornsby says. Still, there have been improvements in customer service, and he and his teams are seeing some of the synergies they expect to see when the process is complete.

Similarly, once integration of all the DCs is complete, BRG Sports will move into Phase 2. At that time, the company will integrate orders with manufacturing so that it can take product directly from the assembly lines to the packing station and shipping dock in response to real-time demand. "We're not there yet," says Hornsby, "but the design and automated conveyor is in place to do that."

"We have some work to do, but that's part of the strategic plan for this facility," he adds. □

Synchronizing omni-channel fulfillment with WCS

BRG Sports' new facility relies on a warehouse control system and voice-directed picking to synchronize parallel pick and pack activities across pick modules.

BRG Sports' new 813,000-square-foot facility in Rantoul, Ill., uses voice-directed picking and warehouse control software (WCS) to tie together full case, split case and piece picking under one roof. The facility also has the capacity to manufacture and assemble four million bicycle helmets a year.

Receiving: The receiving area (1) receives domestic truckload deliveries and import containers on two shifts. Additional product is received from manufacturing and assembly operations (2) co-located in the same building. All deliveries are received against open purchase orders in the warehouse management system (WMS). Once the receipt has been verified and checked for quality, the WMS chooses a put-away location in the very narrow aisle (VNA) reserve storage (3) or conventional aisle reserve storage (4). Palletized product is delivered to a staging area with room for four pallets located at the end of each aisle. Containerized product is verified, palletized and delivered to staging (3, 4). Product received from manufacturing and assembly (2) is stretch-wrapped, tagged and entered into the WMS and then delivered to the staging area (3, 4).

Storage: Most pallets are stored in the reserve storage areas (3, 4). Turret truck operators pick up pallets from the staging area at the end of the aisle. After scanning a license plate bar code label, the operator is directed by the system to a put-away location. The operator scans the storage location to confirm the put-away. The product is now available in the WMS. In addition, some very fast moving product is stored in an area designated for those SKUs (5).

Picking: With a mix of big box retailers, specialty retail and direct-to-customer orders, BRG fills orders for full and mixed pallets, full and mixed cartons, and parcel shipments. Those orders are filled from a full case pick module (6); split case pick modules (7); and reserve storage and fast-moving SKU area (3, 4, 5). To initiate picking, the WCS first analyzes a batch of orders to determine which orders to start first. The WCS also segregates trailer load, LTL and parcel shipments. Picking is directed by voice, while SKU and storage locations are confirmed by a ring scanner and picks are confirmed by voice or a hands-free scan.

BRG Sports Rantoul, Ill.

SIZE: 813,000 square feet
PRODUCTS: Sports helmets, bike helmets, collectible football helmets and accessories
THROUGHPUT: Approximately 10,000 pallets per month
SKUs: 23,000
EMPLOYEES: 360
SHIFTS PER DAY/DAYS PER WEEK: 2 shifts per day; 5 to 6 days per week

• **Full case picking:** When an associate logs onto the voice system in the full case pick area (6), the WCS sends picking instructions to a mobile computer and the associate is directed to the first pick. After the location and SKU are confirmed by scans, cases are picked to a conveyor. The picks are confirmed by voice. Cases are then conveyed to the third floor of a split case module (7) where they are automatically scanned and weighed, and shipping labels are automatically applied.

• **Split case picking:** In the split case area (7), a license plate bar code label is applied to a shipping carton that is then inducted onto the conveyor. The WCS routes the case through the split case module, stopping only in areas where a pick is required. When a case arrives in a pick zone, an associate scans the label on the carton and receives picking instructions by voice. The associate scans the location and SKU labels to confirm the picking location and then picks the right number of items to the container. When the picks are complete, the container is placed back on the conveyor and delivered to the next pick location. Once all of the items for that container have been picked, it is conveyed to the third floor of the module where the print-and-apply system is located.

• **Reserve picking:** Some slower moving SKUs are picked to specially built carts in the reserve storage areas (3, 4). The carts, which hold 12 cartons, are built on a pallet that can be moved by a lift truck. The operator is directed by the voice system to a pick location. Once all of the items for the cartons have been picked, the operator inducts them onto the conveyor system (8) for the split case module. If all of the items for a carton have been picked, the carton will be conveyed to the third floor for labeling. If more items need to be added, the carton will be conveyed to the right pick zone or zones for the additional items and then conveyed to the third floor for packing (7). Fast-moving SKUs (5) are handled in a similar way.

Packing: When a carton arrives at one of the packing stations (7), the packer adds any void fill, packing slips and carton content slips required for the order. If an order has more than one carton, a content list is added to each carton. In addition to a visual inspection by the packer, the process is videotaped for security and quality assurance. Once the order is closed out, the carton is automatically taped and weighed. If the weight of the order matches the estimated weight in the system, the carton is conveyed to the automatic print-and-apply station. After the shipping labels have been applied, the carton is conveyed to a scan tunnel and then sorted (9) to the right shipping lane for that order. In the shipping area, cartons may be fluid loaded into a trailer (10), palletized for full trailer load shipments (11), staged for LTL shipments or readied for parcel shipping (12). □

System suppliers

SYSTEM DESIGN/INTEGRATION, WCS, VOICE PICKING, & PRINT-AND-APPLY SOFTWARE & MOTION SCALES: Numina Group, numinagroup.com

NETWORK MODELING & SITE SELECTION: Competitive Insights, ci-advantage.com; Avison Young, avisonyoung.com

VOICE ENGINE: Topvox, top-vox.com

VOICE HARDWARE, RING SCANNER & MOBILE COMPUTING: Honeywell, honeywell.com

CONVEYOR, NARROW BELT & SHIPPING SORTERS: TGW, tgw-group.com/us-en

PRINT-AND-APPLY HARDWARE: Panther Industries, print-n-apply.com

ERP & WMS: SAP, sap.com

FIXED BAR CODE SCANNING: Sick, sick.com

PICK MODULE & RACKING: Unarco, unarcorack.com

NARROW AISLE LIFT TRUCKS: Raymond, raymondcorp.com