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**Warehouse of the Month**  
**Retrofits like a glove**

**Magid Glove & Safety discovered that old is better than new when it defied conventional wisdom and turned its old factory into a state-of-the-art distribution center.**

**By David Maloney, Senior Editor**  
**Modern Materials Handling**  
**March 1, 2002**

Several years ago, Magid Glove Safety Co. was at a crossroads. Business was growing beyond the space available in the two adjoining buildings that housed its manufacturing and warehouse operations in northwest Chicago. There was also a need to reduce costs and improve overall operations to remain competitive.

"Our efficiencies were poor. We'd build pallets to transport items, store them on the floor, then rebuild them when the product was needed for orders," recalls Greg Cohen, operations manager. Cohen is part of the fourth-generation working in this family-owned business. His grandfather co-founded Magid in 1946 along with his brother Abe (who is still in the business) and Abe's father-in-law, Sam Magid.

The company's dilemma was whether to build new or somehow figure out how to create the needed efficiencies within the aging facility. Erected in the early 1930s, the buildings were originally designed to manufacture radio sets. Radar systems were assembled there during World War II. Later, televisions were produced. It also served as a mattress factory. Magid acquired one of the buildings in 1974 and added the second a few years later. Here it manufactured some of its industrial and consumer work gloves, protective clothing and safety equipment in an area comprising about 20% of the complex.

The remainder housed corporate offices and a warehouse for distributing the manufactured goods and Magid's line of imported and domestic products. All shapes and sizes of boxes were stacked ceiling high on the three floors of the building. Materials handling was basically a manual operation, assisted by pallet jacks and freight elevators.

Cohen admits that in a perfect world, his family would have preferred starting from scratch and building an entirely new facility, but they already owned the existing complex and believed it had potential to be used more effectively. Building new would have been very costly, requiring the family to take on considerable debt. Also, there is not much open land in Chicago for a new building. Magid realized such a facility would have to be built at least 50 miles away, necessitating in essence an entirely new staff.

"We have lots of long-term employees, so there was a human consideration there too," says Marlyse Cohen, marketing manager and Greg's cousin.

Instead, the family moved the manufacturing operations to a 130,000 square foot building about a mile away while turning the existing building into a top-notch distribution center. Holes were knocked through many of the old walls and floors to accommodate the new equipment, such as extensive conveyor and sortation systems (Automation Conveyors, [www.automationconveyors.com](http://www.automationconveyors.com)). The facility also features wireless scanners and radio

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frequency (RF) devices, storage carousels, lift trucks, and a solid warehouse management system (WMS) that makes it work together.

"We literally turned the building upside down," notes Greg Cohen. "We planned our renovation as if it was an empty building. Each room was redesigned."

The building has now moved to paperless processing which has provided space to increase inventory levels. Accuracy has improved to more than 99%. The upgrade also permitted a 30% reduction in labor, provided real-time order information, created 25% more room for growth, increased efficiencies by 80%, made same-day processing the norm, and has improved the value-added services offered to customers.

Cohen adds that his company has hit all original projections with the \$5 million upgrade, the biggest project the family business has ever undertaken. He expects a return on investment within four years.

### **Kid glove handling**

A receiving report is created for each truckload of arriving products. The report contains a list of expected items and a bar code that links to its computer record.

Imported items, including those manufactured at plants Magid owns in the Philippines, use five of the facility's nine receiving docks. Most of these arrive as container shipments tightly packed. The individual cartons are removed by hand and palletized. The receiving report assists in the building of pallets by displaying how many cartons should fit based on known carton dimensions.

Products manufactured at the nearby Chicago plant, as well as items from Magid's 600 other domestic suppliers, enter the building at the four other docks. Most of these are already palletized and are moved by lift truck.

A bar code is attached to each pallet upon arrival. This is scanned along with the bar code on the receiving report to marry the pallet to the product on it. Lift trucks or pallet jacks next take full pallets either directly to reserve storage or to pick up and delivery stations. Less-than-full pallet loads go to forward picking areas.

Reserve storage is broken into two areas – drive-in pallet racks and high-stack racking. Arriving SKUs with four pallets or less head to the single- and double-deep racks of the high-stack area. This part of the facility was at one time a rail siding between the two buildings. Since this was originally an open area, it allowed for very high ceilings when enclosed. A pick up and delivery station is employed here, as the floor level in the high stack area is about four feet below the first floor level of the receiving building. A lift truck on the higher level deposits the load onto floor-level gravity rollers that carry it to an opening between the buildings. A reach truck on the lower floor gathers the pallet from the higher floor and carries it to a location assigned by the WMS via its RF terminal. The pallet is scanned along with the rack location to confirm putaway.

SKUs with more than four pallets are taken to drive-in rack locations. These are spread throughout several rooms of the first floor. The average SKU is represented by about eight stored pallets here, with many having more than 20. Putaway is similar to the procedure of the high-stack area, except of course that lift trucks drive directly into the racks to deposit loads.

Received SKUs of less than a full pallet are taken from the docks to forward pick areas. The top 100 fastest moving SKUs are stored in racks on the first floor to place them closer to shipping. The vast majority of SKUs, however, are taken to the forward pick areas on the second floor and the much smaller third floor. These are conveyed to the upper levels by conveyor where a lift truck or pallet jack gathers the cartons and places them into pallet racks or bin shelving. The shelving holds the slowest moving items.

The actual slotting of SKUs within the forward pick areas is based on pick frequency. About 80% of orders come from only about 10% of SKUs. Faster movers are placed on the second floor closer to the conveyor or the elevators, while the WMS assigns slower moving items to more distant second and third floor locations.

The forward pick areas are also constantly replenished as needed with stock from reserve storage. The WMS directs the pulling of these items from the high-stack and drive-in areas. These are deposited onto the closest freight elevator for transport to the second and third floors, where they are assigned positions as close as possible to the elevator to reduce the handling distance of the lift trucks and pallet jacks used to move the loads.

The facility's forward pick areas also contain flow racks for housing fast moving items and horizontal carousels for medium movers. The conveyor system replenishes both from cases previously placed into the pallet racks of the forward pick areas. Items coming to the flow racks are scanned upon arrival. The WMS assigns a location, which is also scanned to verify proper putaway. Replenishment at the carousels is performed using put-to-light. After scanning the SKU's bar code, the carousels spin and lights illuminate next to either existing or open storage shelves indicating where the product should be placed.

In addition to the placement of receipts into reserve storage and the forward pick areas, all backorders, including special order items, are labeled upon receipt and crossdocked to shipping to fill immediate orders.

### **Finger picking good**

Orders for gloves and other stock items are released for fulfillment every 11/2 hours. Since orders are processed same day, frequent order selection allows Magid to keep up with current demand.

Shipping labels are pre-printed and distributed to the various areas for picking. Full pallets are pulled from reserve storage. These consist of customer orders that alone require a full pallet of a SKU as well as several orders that combine together to demand a full pallet. These batch picks are later broken down as they are assigned to the docks. Lift trucks pull from the drive-in racks, while reach trucks handle picks in the high stack area. Both scan the first label in their pre-printed stack, which causes the display of their RF unit to show the location and quantities to pull. A location bar code is also scanned to verify picking.

If the pallet is for one customer, then only the pallet is labeled and taken directly to the dock (or in the case of items from the high stack area, to the pick-up and delivery station). If the pallet will be broken into several orders, then each carton is labeled and deposited onto a conveyor that feeds a shipping sorter. After passing under a fixed scanner and through an in-line scale, the sorter uses push diverters to nudge each carton down its proper lane towards the nine shipping docks.

About half of all outbound cartons ship directly to customers via UPS. These are manually loaded onto trucks assisted by extendable conveyors. The remainder is palletized and later loaded using pallet jacks or lift trucks.

Full case orders are pulled from the pallet racks and bin shelving of the forward pick areas. Again, RF is used to direct picking to pallets. Each carton is labeled as picked and then the load is taken to an adjacent conveyor that winds through the entire building before joining the line into the shipping sorter.

Split case orders are filled in several places – from carousels, flow racks, and the pallet locations of the forward pick areas. If there is at least one SKU required from the carousels, then picking begins there, otherwise, they begin in the area of the first pick.

Picking from the carousels begins with the scanning of the license plate of an empty tote. This causes the WMS to assign an order to that tote. The carousels then spin to the storage locations of needed SKUs and labels are printed. Lights and quantity displays indicate required items from the storage shelves. The items are pulled, individually labeled, and deposited using put-to-light into one of the eight order totes staged there. If picks are needed from the fast-moving SKUs of the flow racks, then the printers adjacent to the carousel issue labels for those picks too. The labels are then placed into the totes as they are conveyed to the flow racks.

Upon arrival, the RF systems again direct picks from the racks. Items are labeled and put into the totes, which are then placed onto a takeaway conveyor. Next, the totes follow a pick and pass strategy, stopping only at rooms where additional picks from the forward pick racks are required for each order. Push diverters direct the totes to spurs where workers in the rooms scan each tote, then retrieve the needed items from either the pallet racks or bin shelving, as directed by the RF units. Each tote is then placed back onto the main line that goes to all rooms, stopping again at any areas requiring additional picks.

Some picked items are also diverted to a value-added area for special processing. This includes private labeling, special packaging, or the adding of company logos onto glove products. One customer even asks for their gloves to be shrink-wrapped so that they can be dispensed to workers easily from a vending machine.

"We do whatever we can to make sure we never tell a customer 'no'," says Marlyse Cohen.

Magid also sells many of its gloves for household use, such as gardening. Some of these are taken to the value-added area to be attached to displays that are erected in retail stores.

Once all items have been gathered, the tote is then sent to one of 16 packing stations. Again, push diverters are used to send the totes down to individual packing lanes. Items are removed from the totes and placed into outbound cartons, which are labeled and sealed. Special customer packing needs are also met here, such as compliant labeling or placing each item in individual cartons. Some customers also wish packing slips attached to an outside pouch, others want it placed inside, while still more want their lists printed onto a label.

After packing, items are placed onto a takeaway conveyor and fed to the first floor shipping sorter where most split case cartons are diverted to the UPS lane.

#### The best fit

Magid is able to process and ship 95% of its orders same day. The company had done a large amount of same-day processing before the upgrade, but it took many more people to accomplish this. Processing is also much more accurate now with rates over 99%.

"Our errors went down dramatically following the upgrade," says Greg Cohen, "and our returns have dropped 50%."

"Companies in similar situations should take a long look at their building," he says. "New buildings might be an easy answer, but they may not be the best. Old buildings can work well, too."



Click here to read how Magid handled the move to automation.



Click here to learn how another company, Value-Vision, modernized its distribution center to handle products for Polo.com

## Magid Glove & Safety Co., Chicago, Ill.

**Products distributed:** Industrial gloves, safety equipment, protective clothing

**Facility size:** 500,000 square feet

**SKUs:** 25,000

**Storage locations:** 30,000

**Throughput:** 5,000 cartons daily, 1,000 orders

**Inventory accuracy:** 99%+

**Employees:** 79

**Conveyors and sorters:** Automotion, 708-229-3700, [www.automotionconveyors.com](http://www.automotionconveyors.com)

**Lift trucks, powered pallet jacks, reach equipment:** Crown Equipment Corp. 419-629-2311, [www.crownlift.com](http://www.crownlift.com)

**Carousels:** Diamond Phoenix, 207-784-1381, [www.diamondphoenix.com](http://www.diamondphoenix.com)

**Flow racks:** Unex Manufacturing Systems, 732-928-2800, [www.unex.com](http://www.unex.com)

**Drive-in racks:** Ridg-U-Rak, 814-725-8751, [www.ridgurak.com](http://www.ridgurak.com)

**Bin shelving:** Lyon Metal Products, Inc., 800-433-8488, [www.lyonmetal.com](http://www.lyonmetal.com)

**Expandable conveyors:** Best Diversified Products, 800-327-9209, [www.bestconveyors.com](http://www.bestconveyors.com)

**Warehouse management system:** Manhattan Associates (LogisticsPRO), 770-955-7070, [www.manh.com](http://www.manh.com)

**Radio frequency data systems/scanners:**

Teklogix, 606-371-6006, [www.teklogix.com](http://www.teklogix.com)

**Fixed scanners:** Accu-Sort Systems, 800-227-2633, [www.accusort.com](http://www.accusort.com)

**In-line scales:** Mettler-Toledo, 614-438-4511, [www.na.mt.com](http://www.na.mt.com)

**Pack tables:** Dehnco Equipment Co., 708-382-1579, [www.dehnco.com](http://www.dehnco.com)

**Printers:** ZebraTechnologies Corp., 847-634-6700, [www.zebra.com](http://www.zebra.com)

**Plastic totes:** SSI Schaefer, 877-724-2327, [www.ssi.schaefer-us.com](http://www.ssi.schaefer-us.com)

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