Renovating the Warehouse Makes Good Cents

By Shelley Rom and Bruce Howard

"As our business grew, so too did our need for an organized and efficient manufacturing and distribution operations layout," said Ken Conroy, material manager for Tappan Wire and Cable.

Tappan, founded in 1978, is located in Blauvelt, NY, in a 200,000-square-foot building dedicated to the manufacture and distribution of low and medium voltage cables. Their products include electronic/RS-232 cable, fire alarm, sound and security, tray cable, high temperature cable, chemical resistant cable, coaxial video cable, automotive, industrial, water blocked direct burial cable, home automation and home theater cables.

When the company moved into its existing location about seven years ago, the space was more than adequate to meet the company's needs. As Tappan became more successful, however, and distribution and manufacturing activities grew, it became clear that the company needed an inventory master plan to address space utilization issues and streamline its distribution process.

Tappan searched for a firm they felt could meet their goals of reduced aisle space and increased storage capacity. After reviewing several firms' plans and proposals, Abel Womack, Inc., was selected, based on their layout and installation plan, customer and equipment support services, as well as their Raymond lift-truck equipment line.

THE DESIGN STAGE

The building was divided into sections for administration, distribution and manufacturing. The distribution side had 12 to 13-foot wide aisles and used large sit-down counterbalanced lift trucks, as well as non-guided orderpicker trucks to store, pick and move their products.

The various products and pallet sizes presented a huge challenge for the warehouse layout. After a review of the products, it was decided that approximately ten percent of Tappan's products could not be stored in the rack. These extremely large cable reels were stored on the floor, which allowed the staff to pick and pack the product while relieving the layout challenge. Without the extremely large cable reels, the rest of Tappan's products were suitable for a very narrow aisle (VNA) rack layout.

Reducing the existing storage footprint was a key factor in the project as Tappan needed to expand their existing manufacturing lines to meet market demands and new products. As part of the new layout, it was necessary for some of Tappan's vendors to change the size of their pallets so they would fit in the proposed VNA system. Once this was done, the layout really began to take shape. "We looked at several material handling scenarios," said Bruce Howard, project manager for Abel Womack. "We chose the VNA approach as the best way to increase the building's storage capacity while improving the overall picking and distribution process."

Working within the existing structure, Abel Womack's design involved moving the existing racks to accommodate the columns into the flue spaces to gain the necessary space configuration. To ensure the VNA layout would achieve the desired results, the layout was chalked and marked out on the floor before the project began. Some columns had to fall into the actual rack bay and while some storage was lost, the overall gains of additional pallet storage in the VNA

system doubled Tappan's pallet capacity. "Abel Womack and Elite Enterprise, the rack installation firm, put together a creative solution that met Tappan's existing and future needs," said Ken Conroy. "Their experience allowed the racking and equipment solution to make the best utilization of the available space."

THE PROJECT

The most critical element of the renovation was the necessity of keeping Tappan's business operations flowing smoothly, while removing and replacing the racking system and installing the new lift-truck equipment. Once the design had been finalized, the project was organized into two phases over an eight-week period. Pre-ordering and storing the equipment for the project on site made the coordination and complex installation schedule possible. The project was completed with minimal disruptions to Tappan's manufacturing and distribution activities.

Phase I of the project began in early January, 2008. Product was removed from the existing rack and staged on the floor. Employees were still able to access the product during this period. A combination of new and existing rack was moved and the existing 12 to 13 feet aisles were reduced to a width of 72 inches load to load. The rack system was completely decked which allowed Tappan to store pallets that were 48 inches deep, as well as those of a smaller depth. To save time, while the demolition and installation was going on, Tappan employees were trained to operate the new Raymond narrow aisle swing reach and orderpicker trucks. They were also instructed in new picking procedures once the renovation was completed. This was a key factor because once the wire guidance system was installed, that portion of the rack system was fully operational. That meant the now trained operators could reload the rack according to the new slotting arrrangement and resume normal business.

The wire guidance system for the swing reach trucks was the heart of the new rack layout. Using the wire guided system, swing reach and order picker trucks could move at full speed down the aisle without danger to the operators or product. The wire guidance system was installed in one day during each phase of the project. A half-inch deep groove was cut into the concrete floor, guidance wire was laid down, and the cut was grouted over. The wire ran down the center of the new aisles and extended thirteen feet beyond the aisle where it connected to a line driver. Each line driver had three loops which could power 6,000 feet of wire per loop or a total capacity of 18,000 feet. Each loop started at the line driver and completed a loop going through the aisles and returning to the line driver. The line driver sent an FM frequency through the wire which was picked up by a digital sensor mounted on the swing reach and order picker trucks. Once over the wire at the beginning of the aisle, the operator heard an audible tone indicating they were in the correct position. The operator then hit a switch, locking the truck onto the wire's signal.

The wheels automatically centered and there was no need for the operator to steer down the tight aisles. The trucks have a fail-safe system so that if the truck deviated off the wire by one and one-half inches or one and one-half degrees, the truck would slow to half speed. If the truck deviated off the wire by three inches or three degrees, the truck would brake to stop. Because of this safety procedure,

there is little product or rack damage in a wire guided system. With the operator's vehicles locked onto the signal, they were now free to concentrate on lifting and lowering product, picking product and traveling down the aisle without also steering the truck. Once out of the aisle, operators simply switched off the guidance system and traveled the warehouse as a normal lift truck. During this phase, additional wire

was laid down for possible future expansion of the storage rack system.

During Phase II, the rest of the existing rack system was renovated and expanded. New rows were added and wire mesh decking was installed to allow smaller pallets of cable reels and non palletized reels to be stored on the decking. When finished, the renovation allowed 90 percent of Tappan's products to be moved into the new racks.

Phase II was completed on time by the end of February, which proved to be a record production month in the history of the company, even during the height of the renovation.

THE NEW WAREHOUSE LAYOUT

Tappan's inventory master plan involved separating their product lines into five categories. To more efficiently move the product and fill orders, the rack system allowed products to be stored by category. Previously, the product had been placed on racks wherever it could fit, which made the picking and packing process time and personnel intensive. The new rack concept was to have the rack filled by up to 75 to 80 percent of capacity. The empty space in the rack allowed operators to group products together and adhere to the category storage plan, streamlining Tappan's whole distribution process.

Tappan modernized and increased their manufacturing processes by installing new manufacturing equipment in approximately 9,000 square feet of recovered warehouse space. The new equipment included two new planetary machines, a new jacketing line and new armoring equipment. "The new production areas will be used to develop new product types, which prior to our rack installation, we would not have had room to accommodate," said Conroy.

A collateral benefit of the layout was that cycle counting timing decreased from three days to a mere half day. The process could be conducted far more rapidly, especially in fast moving stock.

The project was a success from both the manufacturing and warehouse distribution aspects. In fact, because of the increases in these areas, Tappan is now utilizing the additional wire lines that were installed during Phase I. The new project calls for an additional single row and back-to-back row for additional pallet storage. Since the wire had already been cut with this expansion in mind, Tappan will simply add this rack without the additional expense and delay of another wire installation. ■

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