

# BENCHMARK



## BENCHMARK BRIEFINGS

### SITE

Parker Hannifin,  
Forest City, NC

### APPLICATION

Manufacturer consolidates  
operations with point-of-  
use parts storage

### EQUIPMENT

19 Shuttle™ Vertical Lift  
Modules (VLMs), one  
vertical carousel and  
FastPic™ Inventory  
Management Software

### SUMMARY

Eliminated the need  
to expand facilities to  
accommodate transferred  
manufacturing operations.



**Vertical Storage  
Systems Allow  
Spare Parts For  
Two Facilities To  
Be Consolidated  
Without Any New  
Construction  
Costs**

*By taking advantage of unused overhead space at point-of-use locations throughout the plant, the company eliminated the need for facilities expansion.*

A novel approach to the storage and retrieval of parts used in valve assembly operations has helped Parker Hannifin's Forest City, NC plant improve inventory management and eliminate the need for a major brick and mortar expansion of warehousing facilities.

In 1999 the plant was given the assignment of integrating the manufacturing operations of another Parker Hannifin plant. Initially company management considered assigning the incoming operations to 17,000 square feet - of floor space being used by the Forest City plant's purchased-parts warehouse, then expand the plant with a new 25,000 square feet warehouse.

However, further study prompted consideration of a more revolutionary approach. "Why don't we take advantage of unused overhead space by shifting parts inventory for both the existing and transferred manufacturing operations

into the plant's vertical cube at points-of-use on the shop floor? That was the question we asked ourselves," said Bill Birkenberger, Team Leader at the Forest City plant.

By taking advantage of unused overhead space at point-of-use locations throughout the plant, the company might be able to eliminate the need for facilities expansion altogether, and could benefit from improved storage and retrieval system throughput as well.

Improved inventory control was another potential benefit, according to Ed Bosgra, Process Engineer at the plant. "An analysis of inventory control operations in the existing warehouse indicated that there were areas we could improve on," he said.

### Thinking Vertical

To test the point-of-use storage concept, Parker Hannifin first installed two Remstar Shuttle™ VLMs

(Vertical Lift Modules). The Shuttle VLM is a standalone, modular, enclosed system of vertically arranged storage trays, an ergonomically positioned workstation-type extraction platform, and computerized pushbutton controls for part retrieval. Based on the results of the test installation, 19 Remstar VLMs, one Remstar vertical carousel and five stacker cranes were installed to serve assembly operations on the shop floor.

The VLMs are batched by manufacturing team. For example, the three highest volume teams have been assigned five VLMs each. The five VLMs in each set are located adjacent to one another in a line. Another team has two VLMs, while a transferred manufacturing operation has the single 40-ft-high unit. The final, 19th VLM is assigned to a customer service team that handles repairs and overhauls. The vertical carousel for O-ring storage/retrieval

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**“The VLMs help keep the shop and parts cleaner plus parts are always handled ergonomically at waist height.”**

is in the middle of the plant, while five racks with stacker cranes are spread along the plant centerline.

Each Shuttle VLM at Parker Hannifin occupies about 70 square feet - of floor space and designed to accommodate changing and variable height objects to meet Parker Hannifin's changing needs. The Shuttle VLM employs Remstar's CubeStar™ technology that maximizes the unit's density by storing each tray in the smallest space possible. The technology improves storage efficiency by allowing each tray to be stored in the least amount of vertical space to maximize vertical cube. The system increases storage density by measuring each tray's profile via a light curtain to instantly determine the height required. The control system then determines the tray's best position in the unit, based first on



*A group of Shuttle VLMs service each work cell. Each cell typically consists of machine tools, assembly tables, and test stands. All orders are manufactured to customer order only to meet 1, 2, or 3 day shipment requirements.*

the least amount of space used and then on the fastest retrieval position.

#### **Efficient Picking**

Components are picked individually by keying a part number (p/n) into a PC present at each VLM, or they are picked in volume by keying a bill-of-material (BoM) or order number. The p/n, (BoM) and order numbers are printed on production orders delivered to the teams. When picking to a BoM or order number, the Shuttle VLM automatically cycles from tray to tray as parts are retrieved. If parts are located in

several VLMs of a set, keying the single BoM or order number triggers the VLMs in order. The computer terminals are tied to a single PC server loaded with FastPic inventory management software, developed by FastPic Systems.

The greatest saving of the automated, enclosed, point-of-use storage and retrieval system at Parker Hannifin has been the elimination of the need for a plant expansion to accommodate the transferred manufacturing operation. The shop and parts are cleaner because parts are enclosed within the system, eliminating corrugated containers that previously stored the parts. Parts are always handled at waist height, an ergonomically correct position that helps improve employee productivity. The company has also substantially reduced the number of forklift trucks, which has further reduced operating costs.



*The computer terminals are integrated with FastPic inventory management software. If parts are located in several VLMs keying the single BoM or order number triggers the VLMs to deliver all the parts in sequence.*



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