

Modula uses automation to produce automated storage units

By Sue
Roberts

THE FABRICATOR® AUGUST 2015

August 4, 2015

The Modula U.S.A. plant in Lewiston, Maine, is the result of a \$6 million investment in new equipment, a new focus on manufacturing automated vertical storage (AVS) units, and a renaming by Italian parent company System Logistics. Cost-competitive production resulting from integrated, automatic sheet metal fabricating equipment from Salvagnini was key in the company's decision to locate in the United States.



Figure 1

A lights-out punching, shearing, and forming line replaced outdated equipment to economically produce parts for Modula's AVS units in single-piece, kit, or batch flow.

Modula, a global automated storage systems OEM, practices what it preaches, puts its money where its mouth is, and walks the talk. It is building automation to make companies more efficient and profitable using automation that makes producing its automated vertical storage (AVS) units efficient and profitable.

Lewiston, Maine, home of the company's newest manufacturing facility, builds the high-tech, highly automated AVS

units. System Logistics, Modula's Italian parent company, chose the location an hour away from the Atlantic coastline based on a number of considerations: the edging up of manufacturing costs in many low-wage nations; the more than 1,000 customers already located in the U.S.; plans to aggressively market to Central and South America; and the eight- to 10-week delivery delay coupled with hefty shipping costs for transporting units across the pond.

But it was the availability of integrated, automated fabrication processes that pushed the button on investing \$6 million (see **Figure 1**) to reinvent the company's existing 100,000-sq.-ft. Diamond Phoenix carousel and conveyor factory.

When System Logistics purchased Diamond Phoenix in 2009, the company had transitioned from building shoemaking equipment to producing shoe storage equipment to manufacturing specialized carousels and conveyors. It is credited with building the largest carousel system in the world to hold 1.5 million pairs of shoes for Zappos.



The products were good, profits were not. Outdated equipment used for virtually every process couldn't deliver the conveyors and storage systems along with a profit margin to justify keeping the plant open.

"One of the machines was built in 1922 and the others were extremely outdated. They were from a time when the company was primarily using machine shop-type production methods," said Roberto Dolci, Modula spokesman.

Rather than close shop, System Logistics shifted the facility's focus from horizontal carousels and conveyors to vertical storage equipment. The Diamond Phoenix shop was basically gutted (see **Figure 2**), and integrated, automated sheet metal fabricating processes replaced the antiquated machines. Employees were trained on the advanced equipment and lean practices.

"Now we have a shop that has been revamped to use a highly automated, integrated system. We purchased machinery that considerably increases the productivity on our shop floor and makes it economical to make our vertical lift modules [see **Figure 3**] in the United States," Dolci said. "We will start exporting down to Mexico, Brazil, Argentina, and the like. The whole North American continent will be served by the Lewiston plant [see **Figure 4**]."

Flexibility for Products and Production

A modular approach to building the AVS units is reflected in the company name, Modula. Equipment sections are linked to create storage units of varying widths and heights so every foot of vertical space can be used. Unit widths, running from 4 to 13 ft., can be stacked to within 4 in. of the ceiling to recover up to 90 percent of floor square footage. Units can be broken down, moved, and added to as needs change.

A controlled motion system stores, retrieves, and returns trays within the AVS system. Trays called up by a computer at the operator station arrive in about 30 seconds. Modula estimates that using AVS equipment more than doubles a company's distribution productivity, adding to its competitive edge.



Figure 2

System Logistics gutted the 100,000-sq.-ft. Diamond Phoenix plant in Lewiston, Maine, to make room for new, automated, integrated equipment to produce Modula's AVS units.

"The logic of the machine is pick and place. The machine brings the item to the person so there is no walking up and down, left and right, searching. That creates a huge improvement in productivity," said Dolci. Accuracy is also improved by automated distribution. An LED system along the machine's front rail directs the operator to the correct item.

Twenty-five standard units (see **Figure 5**), with specific models for the pharmaceutical, health care, military, automotive, and energy sectors, fit the specifications of many customers. Customized units are engineered for companies with unusual storage size, weight, or quantity needs. The sizes, types, and quantities of components going into the units make flexible production processes a necessity.

"The variety of customers that have a use for this product is pretty wide," Dolci said. "Shapes and tubes might be stored in trays with a 500-lb. payload, and the pharmacies will use a smaller unit with trays with a 20-lb. payload."

Several of its own units are in place in the Lewiston facility. "We use eight of our machines to store raw materials, semifinished components, and spare parts for American clients. We store in excess of 1,000 items in a very dense, vertical manner."

Automation Makes Plant and Units Cost-competitive

Fifty people who work on Modula's Lewiston shop floor will produce 700 to 750 AVS units a year. Those units will house more than 100,000 stainless steel trays, a number that Dolci said could not be produced using the previous equipment.

An inline automated job shop (AJS) from Salvagnini gives the plant the speed, flexibility, and lights-out capabilities from sheet loading to finished components. Orders determine whether the line produces in a single-piece flow, kits, or batches. OPS software integrates and controls the machines and material handling systems and communicates with material requirements planning (MRP) and enterprise resource planning (ERP) systems to create programs and manage production flow. Production processes are integrated, lean, and flexible.

A punching and shearing center with storage tower, a panel bender, a fiber laser, and a press brake comprise the AVS. Alone, each piece of equipment introduced new technology and automation advantages that weren't available on the Diamond Phoenix shop floor. Linked together via robotic systems and software, the fabricating equipment reins in production costs and increases productivity.

Parts for AVS units flow through unmanned processes that include:

- Punching and shearing done on an S4Xe. A stationary punching head holds between 76 and 96 active punches, eliminating the time required to grab and change tooling and reducing cycle times. A shear is located next to the punching head. The integrated punching/shearing center operates with an automated storage and retrieval system (ASRS) tower and inline, automatic destackers that load materials and send punched/sheared forms downstream.
- Parts from the punch/shear combination or blanks from the L3 fiber laser are automatically directed to a P4Xe panel bender or a B3 hybrid press brake for forming. Universal tooling and Automated Bending Technology (ABT™) on the panel bender fold sheets into drawers or other components. Automatic part centering with automatic compensation for different materials or thicknesses, deflection, or material changes due to environmental factors contributes to the precision of the lights-out operation. Larger pieces are fabricated on the press brake.

An L3, the largest Salvagnini fiber laser, cuts parts from a variety of materials that include a heavy dose of stainless steel and thicknesses up to ¾ in. Laser TRADJUST, a series of functions incorporated into the SiX controller, combines application requirements with the trajectories generated by CAMlaser to calculate and predetermine cutting directions, speeds, and accelerations.

“The drawings of the parts go directly to the machines involved and everything happens in an automated fashion,” said Dolci. “There are some machines that can work unattended for more than a shift and that can smooth out production flow.”



Figure 3

Modular sections of the AVS units can be built to fill and use space to within 4 in. of the ceiling.

“This facility shows that manufacturing in the states is actually a very good business decision. The automation plays

a big part in that.”

The U.S. is already home to more than 1,000 Modula AVS units, and the desire to become more cost-competitive runs across every industry leading, according to Dolci, to an anticipated 9 percent annual growth in supply chain automation. Plans are in place to add second and third shifts to grow the Lewiston workforce and shop output. Modula, with its investment in automated production equipment, is ready to deliver.

Photos courtesy of Modula.



Slide Show | 5 Images

Published In...

The Fabricator®

The FABRICATOR® is North America's leading magazine for the metal forming and fabricating industry. The magazine delivers the news, technical articles, and case histories that enable fabricators to do their jobs more efficiently. The FABRICATOR has served the industry since 1971. Print subscriptions are free to qualified persons in North America involved in metal forming and fabricating.



[Preview the Digital Edition](#)

[Subscribe to The Fabricator®](#)

[Read more from this issue](#)