

Automated Savings



Automated dispensing and tracking of cutting tools can lead to several practical benefits, not the least of which is reduced tooling costs.

Automation can reduce a manufacturer's costs, even when the automation is as seemingly simple as a vending machine that dispenses inserts and other cutting tools rather than candy bars and chewing gum.

The cost savings will vary from parts manufacturer to parts manufacturer, but if a company annually spends \$1.5 million on tools, it may be able to save more than \$362,000 a year by having those tools dispensed by vending machines, according to DGI Supply, Wheeling, Ill., formerly DoALL Industrial Supply.

A vending machine can reduce a shop's costs for inventorying, invoicing and maintaining a supply of cutting tools. Gene Fehringer, a DGI Supply sales representative, said the savings would come from those and other steps being removed from the end user's workload. Consequently, the manufacturer would become more profitable by eliminating the positions performing those steps or more productive by assigning the people who perform the tasks to other work.

Smaller Inventory of Tools

A shop may also decrease its costs by being able to carry a smaller inventory of cutting tools. A smaller inventory may be possible because a vending machine can lower, perhaps even eliminate, a shop's shrinkage rate

by requiring employees to identify themselves to the vending machine to access tools and thereby automatically tracking tool consumption. Employee identification may involve having the machine scan an ID badge or entering a user ID number and password via the

can reduce tool hoarding, which was a problem at Morgan Bronze Products Inc. and Sealmaster.

"Our inventory was handled on the honor system," said Joe Mierzejewski, manufacturing engineering manager for Morgan Bronze. The Wauconda,



Vending machines track tool usage through equipment such as magnetic card readers. Sealmaster's Jason Cotte swipes his ID badge against a reader, and it records who accessed the machine, as well as what tool was selected and when it was selected.

machine's touch pad. In either case, the machine records the tool selected, the date and time it was selected and the name of the person selecting it.

A smaller inventory may also be possible because vending machines

Ill., company manufactures precision bushings, bearings, wear rings and wear plates from bronze, brass, stainless steel, copper, aluminum and cast iron.

Cutting tools were kept in drawers,

and machinists took what they needed. If a drawer was low on tools, a machinist would leave one or two tools on a supervisor's desk so he'd know to order more.

Several years ago, though, Morgan Bronze was preparing to move machines around the shop floor and decided to search the work spaces for tools, expecting that it would find a handful of inserts. More than a handful turned up.

"Once we saw what was surfacing, we decided to search plantwide," Mierzejewski said. "When all was said and done, we had 200 lbs. of inserts.

"The workers were stashing the inserts anywhere they could find—mostly in their lockers and tool chests—which amounted to about \$120,000 in additional costs annually," Mierzejewski said. "The need to have control over the carbide insert inventory was obvious."

So Morgan Bronze bought two vending machines to dispense carbide

inserts on its shop floor. Each machine has 72 helical coils and up to 20 tool locations per coil. Mierzejewski estimates that it's 20 to 30 percent less expensive to have the vending machines than to handle the tool inventory manually.

A smaller inventory of cutting tools may be possible because vending machines can reduce tool hoarding.

The tools can be obtained by more than 25 people at Morgan Bronze, including all production personnel, supervisors and managers.

However, a setup person or machinist can access only one insert at a time and has a maximum number that he can take each day. Consequently, Morgan Bronze can monitor usage.

Vending machines can also be programmed to allow other types of access. As examples, they can allow all permitted employees access to all tools, allow only certain employees to access only certain tools or allow only certain shifts to access certain tools.

Monitoring tool usage can be used to discern manufacturing problems, too. For example, if an operator removes an excessive number of inserts for a job, it could mean there's a problem with tool wear.

Maintaining Tool Supply

Morgan Bronze doesn't maintain the supply of inserts in its vending machines; DGI Supply does.

A vending machine's data on tools selected, people selecting them and dates and times of selections can be accessed by a parts manufacturer via an on-site computer for tool tracking. The data can also be accessed by the vending machine's supplier for maintaining the shop's tool inventory.

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Choosing a tool vending system

There are various types of automated tool vending systems. For example, DGI Supply offers five types: Robo Crib, helical coil, touch screen, automated lockers and automated cabinets.

Robo Crib refers to a vending machine with trays that look like pie plates. Tools or equipment are stored on the adjustable plates, which can be sectioned into halves, thirds, fourths and smaller—all the way to twelfths. This type of machine can dispense up to 2,500 different items. Specialty tools and equipment, like expensive drill bits, gages and power tools, can be returned to the machine after use and be ready for use at a later time by the same or another employee.

A helical coil dispenser is like a snack vending machine, with small or large helical coils depending on the sizes of the tools it holds. A spiral coil may hold up to 30 tools, and a vending machine with six rows of 10 helical coils each can dispense up to 1,800 tools. A seven-row machine can dispense up to 2,100 tools. Also, when dispensed, tools are dropped onto a padded tray.

A touch-screen machine is similar to a helical coil one, except it has a touch screen instead of a touch pad. The screen allows an employee to look up a desired tool from a list on the screen. If the tool isn't available in that ma-

chine and the shop has more than one machine on-site, the employee can use the screen to see whether the tool is available in another machine.

Automated lockers are like small gym lockers and are suitable for larger tools that don't fit into a helical coil vend-



Automated vending systems include helical coil vending machines and automated lockers, such as these on Sealmaster's shop floor, and other types of systems, too.

ing machine or for tools that must be returned after use. Multiple locker sizes are available.

Automated cabinets are electronically controlled toolboxes for storing and dispensing larger tools. A cabinet allows

access to only one drawer each time an employee enters his identification.

Besides vending machines, another type of automated inventory system is a toolcrib solution. This system consists of a hand-held scanner that reads a bar code associated with a storage space for a tool. By scanning the code, a machine shop can track and record its use of the tool. Also, this system allows tools to be checked in again.

A second type of system features radio frequency identification (RFID) technology. DGI Supply's system, called Accu-Port, consists of a portal or doorway that leads into a secured area.

As an employee passes through the doorway, his badge is read via the portal's antennas. The employee's name is announced by the portal, and the toolroom's door unlocks if he has permission to enter the area. He enters the room and obtains his needed items, each of which has an RFID tag affixed to it.

After he gathers all the items, the employee presses the room's exit button to unlock the door and walks back through the Accu-Port, which automatically reads the tags and records in real time which items were removed. The system provides accountability for the issue and return of items without needing an attendant.

—B. Hindman

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DGI Supply accesses the data by logging onto a Web site that connects it to the computer. When a machine's stock drops to a predetermined level, the company ships a new supply to the shop. According to DGI Supply, its shipments usually reach a shop within 2 business days. A DGI Supply employee then visits the shop, unpacks the shipment and restocks the vending machine. Or the shipment may be sent directly to a DGI Supply representative, who then takes it to the shop to restock the machine.

In Morgan Bronze's case, a DGI Supply employee arrives after the shop receives a shipment and restocks the machines every other day. This arrangement improved Morgan Bronze's manufacturing operations. "Our frequency of running out of cutting tools has significantly decreased," Mierzejewski said.

Also, if a shop wants its vending machine stocked with a cutting tool that DGI Supply doesn't carry, the shop itself can have buy the tool from another supplier or can have DGI Supply buy it from another supplier. Fehringer added that it takes about 20 minutes to restock a helical coil vending machine.

Vending machines can also dispense nonperishable items, such as inspection gages. Larger tools may not fit inside a



Morgan Bronze's two vending machines are restocked as needed by DGI Supply employees, relieving the shop of the responsibility of maintaining its insert supply.

vending machine though, so a parts manufacturer may need to buy another type of automated inventory system for those tools.

Morgan Bronze considered placing drills, endmills and tooling hardware, such as screws and shims, in its vending machines but decided against it because their turn rates were low. Instead it chose to place only the high demand inserts in the machines. In 2007, though, Morgan Bronze created a dedicated toolroom with an attendant, who locks the room

The following companies contributed to this report:

DGI Supply

(800) 923-6255
www.dgisupply.com

Morgan Bronze Products Inc.

(800) 445-9970
www.morganbronze.com

Sealmaster (Emerson Power Transmission)

(800) 626-2120
www.emerson-ept.com

whenever he isn't in it. Thus, the company has a way of controlling the rest of its tool inventory.

Seeing Insert Supply

Like Morgan Bronze, Sealmaster also experienced tool hoarding even though it had a toolroom with an attendant for each of its three shifts.

Jason Cotte, Sealmaster's manufacturing engineer manager, said shop personnel would take too many tools and stash them in their lockers to ensure they had enough tools to get their work done. "With the vending machines,"

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5 Tools: each a different size and each stored in a different drawer in the tool chest.

Can you identify the size & drawer each tool is stored in?

- The 1/16" tool is in the middle drawer.
- The Endmill is stored below the 1/4" tool.
- The Reamer is exactly 1/8" smaller than the Burr.
- The Drill is stored below the Reamer, and the 3/8" Countersink is stored above both of them.
- The Drill is not the 1/2" tool.
- The sizes of all tools added together equals 1-5/16"

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he said, “operators walk by the machines and see that plenty of inserts are on-hand, so they don’t feel they have to maintain their own inventory.”

Sealmaster (Emerson Power Transmission), Aurora, Ill., makes precision bearings and has two vending machines on its shop floor. More than 80 people have full access to the items in the machines. About 80 percent of the machines’ items are carbide inserts. The rest are dies, drill collets, taps and toolholders.

The vending machines proved so effective that Sealmaster was able to eliminate its toolroom. “We eliminated three toolroom attendant positions, one for each of our three shifts,” Cotte said. “That saved us about \$120,000

Through remote monitoring, a vending machine supplier can ship new tools to a parts manufacturer when a machine’s stock decreases to a predetermined level and then can dispatch an employee to restock the machine.

annually.”

Like Morgan Bronze, Sealmaster’s vending machines are restocked by DGI Supply employees.

According to Kevin Klein, Sealmaster’s senior buyer, it is 25 percent less expensive to have the vending machines than a toolroom. He added, “The thing I like best about vending machines dispensing tools instead of having a toolroom is that

you don’t have to invest a lot of money to maintain a sufficient tool inventory.” △

About the Author

Bill Hindman is president of Industrial Marketing Services Inc., Elk Grove Village, Ill. He joined IMS more than 25 years ago and has written many articles on manufacturing technology and product applications.