



STRAIGHT UP

Vertical lifts allow metal forming shops to control inventory safely

By Patrick Roberts

The growing movement toward smaller order sizes and just-in-time delivery has placed very high demands on all aspects of manufacturing, including sheet metal forming.

The technologies for mechanical, hydraulic and pneumatic presses used for metalworking have adapted, with improved automation and drive engineering, and extremely fast response times. Many presses have been upgraded for better execution of critical press safety functions by integrating controls and safety into one package for better protection of operators and machines, a welcome addition when running a 500- or 1,000-ton press.

But, not all aspects of sheet metal forming are quite so automated. The storage and supply of sheet metal to processing machines, is one such area. Although most high-volume metalworking manufacturers utilize highly automated and usually complex lift systems for storing sheet metal and releasing it into production, most medium- to smaller-volume manufacturers still manage this operation with fixed racking and forklifts.

Such manual storage and material handling procedures not only consume large areas of valuable production space, and are highly labour intensive, but they also frequently require interruption of adjacent production areas, slowing throughput, and increasing the probability of workplace accidents.

Safety is key

Safety is, of course, a serious issue in sheet metal work. One area of critical focus is forklift safety.

The Industrial Truck Association states that over 11 percent of all forklifts are involved in some type of accident each year. OSHA statistics indicate that there are approximately 85 forklift fatalities annually in the US. Plus there are an additional 34,900 serious forklift injuries, and 61,800 forklift injuries classified as non-serious each year.

According to OSHA, 42 percent of forklift fatalities occur in manufacturing, and almost half of those deaths are caused by the forklift tipping because of unstable loads. To reduce the possibility of this happening, OSHA recommends keeping the forklift load as low as possible. But this is not feasible when using forklifts to manipulate 5-foot by 10-foot sheets of sheet metal from stationary storage locations 14 feet above the floor.

Metalworking manufacturing operations that implement effective safety and health management systems may expect to significantly reduce injuries and illnesses, and reduce the costs associated with these injuries and illnesses, including workers' compensation payments, medical expenses, and lost productivity. In addition, such manufacturers often find that process and other changes made to improve workplace safety and health may result in significant improvements to productivity and profitability.

Despite these safety concerns and potential benefits,



the vast majority of small-to-medium-size metalworking manufacturers have not availed themselves of automated systems for sheet metal storage. Instead, they continue to rely on forklifts to facilitate the movement of sheet metal in and out of stationary storage racks, risking the potential for worker injury.



Automated sheet metal vertical lifts

This scenario may now be changing for low-to-medium-volume sheet metal manufacturers. A new generation of automated sheet metal vertical lifts, now enable low- to medium-volume sheet metal manufacturers to easily access automated storage within their production areas. Different from vertical lifts used to service high-volume production areas, these new fully automated systems are designed for smaller sheet metal volumes.

One such system is designed and built by Manitoba-based Vidir Machine. Like the bigger systems, the Vidir lift can be adapted for the storage of sheet metal, bar stock, press brake dies and punches, and other industrial materials.

Designed to feed processing centres, and specifically sheet lasers directly, the sheet metal lift creates a storage centre capable of continuously feeding production machines to minimize downtime and increase operational efficiency.

The system can be configured between 10 feet and 24 feet in height, with up to 38 shelf storage positions, for storage with pallets or without, each capable of supporting 5,000 pounds. Instead of a forklift suspending a 5,000-pound pallet of sheet metal or a 3,000-pound press die a dozen feet above the work area, the system's elevator, driven by rack and pinion (rack and pinion drive provides a more positive movement, better stability and less servicing compared to chain- or belt-driven designs), travels vertically, bringing the desired shelf supporting the contents down to an ergonomically comfortable position for the operator to access.

Once the sheet metal, roll bar or die is accessed by the operator, it can be transported to the process machine via suction device, or carried by forklift at a low, relatively safe height. These new-generation lifts greatly remove the forklift from the equation.

Workers can load and unload the machine at a safe height

Designed for low- to medium-level sheet metal manufacturers

Detail of positioning clip
on shelf



“Vidir developed this lift storage system as a base-level machine,” said Paul Peters, director of engineering for Vidir Machine. “It was not intended for a large processing facility that would integrate storage modules throughout the manufacturing centre. We developed this unit so manufacturers could load at a safe height, and the machine could then do the put-away. It incorporates a single rack with 20 to 30 storage locations that would serve as a supply point to several presses or laser cutters.”

Although this sheet metal lift does not incorporate the integration capability found with larger systems, it nevertheless is equipped with industry-standard controls and safety. PLC-driven automated controls, with a touch screen, enable precise control of the shelves.

It is also equipped with inventory control software. The safety system is designed to SIL 3/CAT 4, featuring access restriction fencing around the perimeter, and light curtains to prevent access during operation.

Improved operational efficiency

New-generation automated sheet metal storage systems increase workplace safety and product security by providing a secure and controlled delivery method for heavy pallets of sheet metal stored overhead. Manufacturers can reduce their storage footprint by combining multiple sheet metal racks into a single tower that feeds processing machines directly. The added accessibility, increased storage, and improved material flow will increase efficiency resulting in a tangible ROI.

According to Peters, “Aside from the improved safety benefits, many [smaller manufacturers] realize a 50 to 75 percent reduction in cycle time when supplying sheet metal to process machines.”

No longer do sections of the shop have to temporarily shut down to allow for forklift manipulation of large loads suspended near their work areas. No longer do workers have to be pulled from their assigned production tasks to spot these forklift loads, which impacts labour costs. No longer do manufacturers have to absorb the costs of facility, material and product damage from forklift usage. These are tangible benefits that can be realized by any metalforming facility.

Shorter runs and just-in-time ordering are necessitating more frequent changeovers, which means more frequent access to metal storage locations, and more frequent maneuvering of suspended loads with forklifts. These factors are driving small- and medium-volume sheet metal manufacturers to rethink their operational processes. Incorporating vertical lifts is one way they can achieve efficiencies. **MM&D**

The machine can be adapted
for the storage of bar stock,
press brake dies and punches

