Turntables Reduce Worker Strain and Increase Productivity

BY JEAN FEINGOLD

The constant moving required of workers engaged in manual material handling (MMH) can cause injury. One particularly stressful movement is reaching out or forward from the body while lifting. In fact, the likelihood of injury when reaching out is greater than when bending forward, noted Jim Galante of MHI member Southworth Products, who is also chairman of the Ergonomic Assist Systems and Equipment (EASE) industry group of MHI. Another stressful activity is "translating," which is when the torso turns to either side while reaching out.

To reduce potential injuries from reaching out and/or translating, use a turntable. "Turntables turn the work instead of the worker, reducing stress on the lower back and side muscles," said Galante. "They let the worker stay in one place while painting, assembling and connecting equipment. During pallet loading, tests determined that about 40 percent of the time workers spent loading a pallet involved walking around it. By turning the pallet using a turntable, the worker is always doing near-side loading. Productivity is increased because the worker can work more by walking less. Turntables complement LEAN manufacturing by avoiding wasted motion by workers."

Turntables can be manual or powered. For loads less than 4,000 pounds, manual turntables are usually adequate, with powered turntables are preferred for heavier loads. While most turntables can rotate 360 degrees, others rotate lesser amounts, like 90 degrees, and then return to their original position.

"Turntables turn the work instead of the worker, reducing stress on the lower back and side muscles."

—Jim Galante, Southworth Products

Depending on the size of what will be rotated, turntable diameters can vary wildly, from a few inches to many feet. The turntable's platform may be smooth or abrasive, and round, square or any shape to accommodate a load's configuration.

"Turntables can be fitted with special fixtures or tooling to hold something in a specific position or angle, permitting better access to the work piece on top," Galante noted. "Turntables can be flat disks on the floor. These turntables, which are pallet jack accessible, can accommodate pallets which are then rotated, allowing workers to reach all sides of the pallet without having to walk around it." Turntables can also be mounted on workbenches or lift tables. Typically such manual turntables are less than 3 inches tall while powered mounted turntables are 4 to 12 inches tall.

Choosing the right turntable for the job

To select the right turntable for a particular use, the buyer needs to assess their

process, production rate, environment and budget, explained Tom Beach of MHI member Handling Specialty. "If the equipment is to manage a high volume production rate, it will require a more robust means of rotation such as a slewing ring," he said. "If the environment is rugged, such as a foundry, they should select a means of rotation resilient to airborne particulate. Buyers need to spend time creating a layout as well so the swing radius of the turntable doesn't impede walking areas or other work cells."

The learning curve for turntables is short and workers rarely circumvent them. "Typically workers get on board very quickly unless the purchase is causing them to do extra work they deem annoying or tiring," Beach said. "The turntable should be an ergonomic assist and not a task increaser. Every time we see a worker not having to reach out across a large pallet, we see a smile and easy adaptability."

Three mechanisms are used to control manual turntables. A spring loaded detent brings the turntable to a certain position. When the worker is ready, they push the turntable and it clicks into that position and stays there. Four position settings are typical but there can be more or less.

With a brake assembly, a lever with a shoe on the end operates like brakes in a car. It can slow the turntable's rotation or gradually stop it. A turntable lock involves putting a pin in a hole to lock the turntable into a specific position until the pin is removed.

Powered turntables can rotate continuously or index to pre-determined positions. They are often used for right-angle transfers on conveyor systems or to change the orientation of a load on a conveyor.

A modest amount of maintenance to keep the turning mechanism clean is needed. "If you have a dirty environment and do not protect the rotating element you can increase friction, causing the workers to work harder to push the turntable around so they end up leaving it static," noted Beach. "The rotating elements, inverted casters, cam followers, ball transfers and slewing rings all need to be kept clean to be efficient. Small brushes can be added to keep surface dust off the load bearing elements." When a turntable experiences any large impact it should be assessed for repair before continuing use. Regular inspection and routine maintenance can ensure turntables a long, trouble free service life.

"To select the right turntable for a particular use, the buyer needs to assess their process, production rate, environment and budget."

—Tom Beach, Handling Specialty

Prices range from a few hundred dollars for stock small manual turntables to thousands of dollars for custom designed large powered turntables used for large work pieces like theaters, wind tunnels or robotic work cells. While turntables are often associated with stacking or de-stacking products on a 40" x 48" skid, Beach said he has seen turntables produce a very good return when used as an assembly tool, allowing the assembler to rotate the work closer. "Imagine something like a photocopier that stays in one position for a long time as it is assembled but it has two sides," he said. "A worker can work on one side and then swing the copier around quickly to the other side to complete the work without moving himself or his tools." ●