



Industrial Lift & Hoist

Cranes in Manufacturing

Overhead Lifting
Technology as a
Production Tool

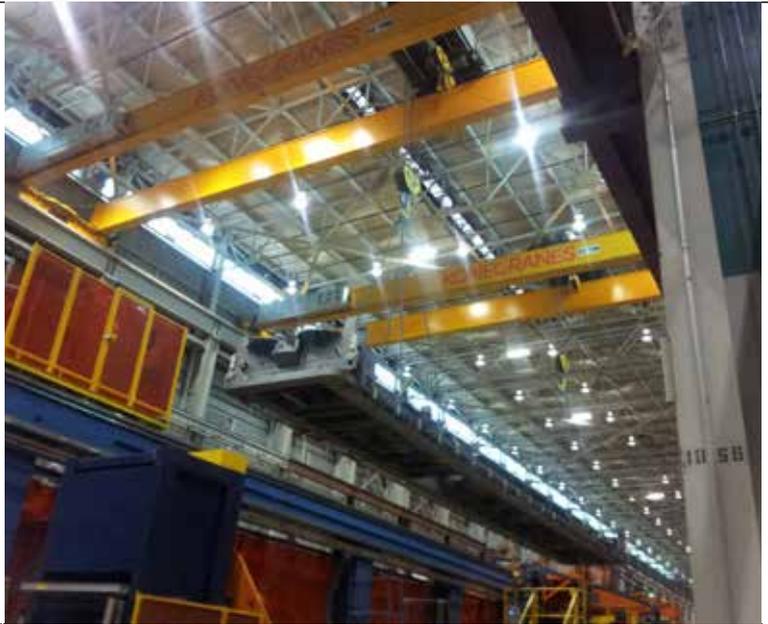
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Rigging
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Productive Picking

Overhead cranes used by equipment manufacturers are tailored to the specific requirements of the application.



By Mike Larson

■ Mike Larson is editor of sister publication, *Lift and Access*.

■ Overhead cranes in factories are vital to efficiency in manufacturing processes.

AS RECENT INSTALLATIONS prove, industrial cranes provide end users with safe and efficient ways to lift and move materials during their production and manufacturing processes.

Mike James, vice president and general manager of industrial cranes for Konecranes, says that customers' purchasing trends tend to follow the economy, but depending on an individual customer's needs and business cycle, the purchases may lag or precede the economic wave.

"Structures haven't changed a lot. Controls are where it's at, particularly new smart features," says James. He adds that factory cranes often do not have full-time operators anymore, as they did a decade or two ago. Today, the crane is often run by someone whose main job is running a machine tool or doing some other kind of work.

"Today, there are many factory crane operators who are relatively unskilled simply because operating the crane is not their full-time job," he says. "The new smart features help improve safety, particularly when an unskilled operator is at the controls."

Some of the smart features include variable frequency drives (VFDs), adaptable speed control, anti-sway control, shock-load resistance, auto-positioning that can be programmed to perform repetitive tasks, and zone protection that prevents a crane from going into prescribed areas.

Another trend James has noticed among factory crane purchasers is that all are looking for better ways to handle material. He says that over the past decade, he has seen the emergence of "workstation cranes," which typically have capacities of 2 tons or less, with many lifting only about 200 lbs. James says that there are many suppliers providing this kind of crane.

Rob Beightol, product marketing manager for Gorbelt, concurs that customization and productivity features are important in workstation cranes. "Regarding Gorbelt workstation cranes, many companies appreciate the flexibility of the systems," he says. Beightol adds that although Gorbelt offers standard systems, its ability to provide an exact configuration to satisfy a specific requirement for a particular job provides a custom feel.

He also notes that his company's workstations are easy to modify and assemble, so changes in work processes, modifications in plant layouts,

or similar variables can many times be accommodated through only minor modifications in the system.

ILH's search for large-scale trends unearthed some interesting individual approaches and projects that illustrate how individual equipment manufacturers have found solutions to their unique needs.

Uesco at Oerlikon Fairfield

Oerlikon Fairfield, Lafayette, Ind., manufactures wheel drive products, planetary gearboxes, and individual gears that become vital components for a wide range of mobile off-road equipment. The larger gearboxes weigh as much as 24,000 lbs., and the individual gears measure up to 78.7 in. in diameter.

The company's products are used by well-known manufacturers in a wide array of equipment, including aerial lifts, forklifts, cranes, skid steer loaders, and other construction machinery, agricultural equipment, locomotives, mining machinery, and even jack-up barges.

As part of an upgrade to its manufacturing process, Oerlikon planned to install a new computerized and automated "coordinate measuring machine" to increase production speed and the company's capacity for verifying that the locations and diameters of holes and gear teeth, as well as the overall diameter, roundness, and other dimensions of gears and other components are accurate to tolerances as tight as 1/100,000 in.

To ensure that the measurements be made under controlled conditions for maximum accuracy, the new machine would have to operate in a closed room with carefully regulated temperature. So inside



■ Uesco designed a crane to meet space limitations at Oerlikon.

of its existing factory, Oerlikon needed to construct a new freestanding building with its own HVAC system to house the measuring machine.

The desired factory location had space limitations, so the new testing building could stand only about 40-ft. long, 15'6" wide, and 17'9" high.

As part of the project, Oerlikon needed to install a 5-ton rail-mounted overhead crane inside the new testing building to handle gears and other components going to and from the measuring machine. The crane would also help maintain or repair the new measuring machine as needed. "We essentially needed to pack 10 lbs. of equipment in a 5-lb. box," says Anthony Schenck, Oerlikon Fairfield's facility engineering supervisor.

Oerlikon specifically wanted an overhead crane to handle material in the measuring room so there would be no chance of a forklift bumping into the precisely calibrated measuring machine.

The material handling process starts with a forklift placing a component on an air pallet just outside the door to the measuring room. The measuring machine operator then moves the air pallet and component into the room, picks up the component with the overhead crane, and places it on the measuring machine's approximately 10'x20' granite work table. The machine manufacturer selected granite for its resistance to wear and its thermal stability.

The computerized coordinate measuring machine then runs through its program of checks to make sure the component is accurate. When the verification is complete, the component is removed from the machine with the crane and taken back outside on an air pallet before a forklift takes it to its next destination.

Oerlikon's main challenge in finding the right crane for the job was getting a machine that had enough height under its bridge to clear the 15'6.5" tall measuring machine, but the top could still stay the OSHA-required 3 in. below any overhead obstructions.

Essentially, Oerlikon needed a 5-ton crane with a bridge girder that was 15 ft. long but no more than 23.5-in. deep. In addition, the crane needed to have precise controls for placing components gently onto the measuring machine. The strength of the existing factory floor assured that floor loadings were not an issue.

Many potential suppliers offered proposals, but Oerlikon selected a crane from Uesco Industries Inc., Alsip, Ill., based on the crane's capabilities, dimensions, bid price, and on Oerlikon's excellent past working relationship with Uesco and Uesco's dealer in the area, Cardinal Integrated Systems, Louisville, Ky.

Uesco's previous crane projects for Oerlikon included a floor-mounted top-running crane and two bottom-running ceiling-supported cranes.

Uesco's crane solution for this job included a top-running, dual-motor, single-girder crane with an under-running, low-headroom, monorail hoist. The crane's runway system includes four vertical columns anchored into the floor supporting two 39-ft. long runway beams whose ends are connected by a header beam on each end. The runway system is braced to columns of the existing building.

Ryan Marks, an application specialist and regional sales manager for Uesco, says that because Uesco designs and manufactures its own end trucks and the way that the trucks connect to the crane's bridge girder, the company was able to provide Oerlikon a crane that had both

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the clear height needed beneath the bridge and the overhead clearance required by OSHA.

“Together, the coped ends of the bridge girder, our fixtured end-trucks, the end-truck mounting system, and the self-centering tapered wheels provide a square and level wheelbase that helps the crane travel straighter and more quietly. It also lets you position loads more accurately,” says Marks. He adds that the end-truck design also lets the crane’s bridge girder sit lower on the truck, increasing overhead clearance.

To help keep the crane within the required clearances, Uesco mounted the electrical control panels alongside the vertical section of the crane’s bridge girder so that they don’t add any height or depth to the crane. To simplify maintenance and troubleshooting, the controls use readily available components and color-coded wiring.

Marks says Uesco selected VFD controls on the bridge and trolley, as well as an R&M hoist with two-speed control to meet the Oerlikon’s operating-speed and controllability requirements. The crane runs on 460V, three-phase electricity supplied from the factory’s electrical system. The crane, hoist, and runway system took just three days to install.

The girder clears the coordinate measuring machine when the machine is in home position, but the trolley needs to be positioned at one end of the girder to pass. If the measuring machine is not in home position, the crane’s bridge girder could hit it.

To prevent potential collisions, a simple relay switch was mounted on one of the runway beams. If the crane passes the switch when the

measuring machine is anywhere but in home position, the electrical system stops the crane from moving closer to the machine.

Oerlikon’s Schenck says the crane handles components weighing up to 7,400 lbs., with the majority of the loads weighing from 4,000 to 6,000 lbs. “The crane has worked perfectly ever since it was installed, and it requires almost no maintenance other than an annual inspection,” he says.

Konecranes at Railcar Factory

When a major maker of railroad equipment ordered two 60-ton capacity double girder, top-running CXT cranes from Konecranes for its manufacturing operation, the operations staff planned to use the two cranes independently on the same runway.

About a month before Konecranes delivered the two cranes, however, the train manufacturer realized it would need both new cranes working together in order to safely lift and move the 120-ft. long train car frames during production. To meet that need, the train manufacturer wanted to change to dual operator radio controls that would let one operator run both cranes in unison. Konecranes made the upgrade and still delivered the cranes on the original installation schedule.

When the train factory installed two automated welding machines to speed up frame fabrication, the new machines blocked the view of crane operators who moved the long train car frames with the dual-crane arrangement. When the cranes reached a point that the machines hid the load from the operator’s view, the crane operator had to stop the crane and walk around the welding machines before continuing the move. During that 45-second walk around the welders, the crane operator could not see the suspended load.

To solve the problem, Konecranes suggested installing its “pitch and catch” dual remote control system, which lets one crane operator start a move, then signal another operator with a second controller to take over and finish. The system increases safety by always keeping the suspended load under the control of a crane operator who can see it.

Andrew Grooms, a Konecranes service manager who was involved in the installation of the cranes, installation of the pitch and catch controls, and training of the operators, says that the system has been running very well 24/7 for three years.

At another location in the same factory, the train company was thinking of replacing two old 300-ton overhead cranes that had been in the plant when it had purchased the facility. Grooms says that the two cranes were structurally solid, so Konecranes was able to save the customer significant cost by reusing the structural components while upgrading to all-new AC drives, inverters, radio controls, and other operating and control components.

Grooms says overhead crane modernization is a trend now, with many users looking to improve safety and productivity.



■ Two new overhead cranes and a dual control system helped a railcar manufacturer improve both lifting capacity and safety.

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