

## Electric Chain Hoists Are Safe, Ergonomic Solutions for Load Movement in Industrial Facilities

BY JEAN FEINGOLD

**E**lectric chain hoists have been mass produced since the early 1900s to lift and lower items in industrial facilities. Even for a relatively low-weight item, say 10 pounds, it is beneficial to use a hoist to prevent operator fatigue if the lifting process is done 50 times per hour during an 8-hour shift, noted Brian Stephens, senior product manager, modular cranes and drives, for MHI Member Demag Cranes and Components Corp.

“Companies with more progressive and stringent ergonomic standards require the use of a lifting device for loads as light as 20 pounds or even less,” said David Butwid, vice president of sales and marketing for MHI member Gorbel® Inc. “As a general rule any load over 51 pounds should not be lifted by a single worker without a lifting device.” The Cal/OSHA Division of Occupational Safety and Health, California Department of Industrial Relations and the National Institute for Occupational Safety and Health offer guidelines for determining whether manual material handling can be safely

used or if a mechanical lifting device, like a hoist, is recommended.

Maximum capacity for electric chain hoists is typically determined by the manufacturer, with the majority of chain hoist units sold in the 2 ton and less range. Above 5 tons, wire rope hoists, which can lift very heavy loads, are more generally used.

### Hoist selection

Deciding on the proper hoist may best be done as a collaborative effort between the end user and the chain hoist manufacturer or distributor. This enables optimum product selection to suit the application requirements.

Factors to be considered include load weight, amount of lift, speed, duty cycle and cost. Load handling attachments include simple hooks or slings, complex gripping-type devices, clamps, magnets, spreader beams and custom fixture type end effectors. Sometimes the type of attachment helps determine whether to use a chain or wire rope hoist. Remember that the load of any handling attachments used

must be factored into the “live load” to make sure the total weight is within the hoist’s capacity.

Chain hoists can be powered electrically, pneumatically or manually. Those without external power are normally used only for lower capacity, non-repetitive operations. “Cranes are the primary anchor point for electric chain hoists, but the type of crane can vary widely,” Butwid said. “Jib cranes, enclosed track bridge cranes, monorails and mobile gantry cranes all have been used as convenient anchors.”

“Chain hoists can be attached to virtually any structure, but it is highly dependent on the application,” said Stephens. “If you have a stationary point where you will always be lifting and lowering loads in the same spot, then you can attach your chain hoist via a suspension bracket or hook. If you need to lift and lower along a single path, then you can attach the chain hoist to a trolley (either manual or powered), which allows the hoist to travel along the desired path. You would attach a hoist to a crane in an application where





Hoists from Demag Cranes and Components Corp

you need to cover a working envelope in your lifting and lowering application.”

Installation of hoists is relatively easy, often using simple connections to plug in these ready-to-use devices. Regular maintenance based on hours of operation is required. Chain lubrication is the most important maintenance task. Properly maintained hoists can last for decades. The payback period will be shorter for companies experiencing high insurance or loss of productivity costs due to injured workers than for those without such costs. Butwid said most hoists pay for themselves in less than a year.

### Safety considerations

Hoists should not be overloaded. A common way manufacturers prevent workers from overloading a chain hoist

is to supply the unit with a mechanical slip clutch within its powertrain. “The slip clutch is a friction material designed to ‘slip’ if the hoist is trying to lift a load weight above the rating capacity plus an additional factor,” Stephens explained. A 125 to 160 percent factor is typically used when setting the slip clutch. This prevents the hoist from trying to lift too much weight but will not cause nuisance slips if the hoist is lifting only slightly above the rated capacity.

Butwid said electric chain hoists are safe to use. Many users conduct standard classes tying in the use of a crane with best practices for rigging, positioning and lifting. Before using a hoist, operators must at least read its operator’s manual to become familiar with all warnings, instructions and recommendations related to its safe use.

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*—Brian Stephens, senior product manager, modular cranes and drives, Demag Cranes and Components Corp.*

Facilities should also provide additional training related to the application for which the hoist is being used.

“Chain hoists today are extremely safe and easy to use,” said Stephens. Most use a push-button pendant which typically indicates direction of motion pictorially so operation is intuitive.

“Probably the biggest ergonomic benefit of using hoists is the reduction in back injury and other related repetitive lifting motion injury claims by company workers,” noted Stephens. “In addition, most manufacturers today have designed their product features with ergonomics in mind. For example, many manufacturers have designed their push-button pendants to reduce hand fatigue of the operator.”

“The goal for many companies is to improve productivity and safety while eliminating manual movement of the load and an electric chain hoist does just that,” Butwid pointed out. “In comparison to lifting or moving without any device or utilizing manual chain hoists that require substantial effort by the worker, electric chain hoists offer superior ergonomic benefits.”

To learn more about electric chain hoists, visit the Hoist Manufacturer’s Institute at [MHI.org/HMI](http://MHI.org/HMI). ●



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