Save Your Back

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From repetitive motion to lifting risks, the warehouse presents many challenges to personnel safety. Repetitive motion of any type, when sustained over too long a time period, can result in injury, says Dave Lippert, president of Hamilton Caster & Mfg. Co. “Manufacturers can help reduce injuries by providing equipment that eliminates risky motions,” he says, “such as reaching too far to position products for transit, and by observing best ergonomic practices for working height.

“This will minimize bending and twisting – two enemies of good ergonomics.”

Ergonomic Equipment

Equipment such as industrial carts that will help mitigate potentially repetitive bending and twisting movements can prevent strains, sprains, and other workplace injuries. These carts can offer significant benefits to the workers loading and unloading them, and can be custom designed in close coordination with the workers loading parts in a warehouse, as well as the manufacturers using the parts on an assembly line. For example, a cart used in automotive assembly plants features rotating carousels, each containing parts bins at different heights. The bin heights are completely within the ergonomic zone specified by the end user, Lippert explains, and the carousels rotate easily, “reducing reach to a minimal level.” Ergonomic bin options include anti-friction UHMW (Ultra High Molecular Weight) bases, making it easy for the operator to slide the part out of the bin. Locks on the rotating carousels can assure stability during transit, while easy to apply wheel brakes can ensure the cart will remain in the desired position during use. Special handles can provide leverage for operators to steer carts through an industrial environment.

“Equipment manufacturers sensitive to ergonomics consider the forces necessary to start rolling motion, sustain the rolling, steering, and also stopping,” Lippert says. These are an important consideration in warehousing and distribution, where he says back injuries “may be the single largest personal injury category.”

And many of these back injuries occur from seemingly simple pushing and pulling, which can introduce significant strain on a person’s entire upper body. Also seemingly simple, is the wheel component of industrial material handling – “the biggest design factor in cart rollability,” according to Lippert. “The wheel diameter is critical, and larger wheels roll more easily,” he adds. Doubling the size of the wheel cuts the pushing or pulling force in half, but another key factor is the tread type, which determines the rolling friction. Softer treads generally create more friction (oppose motion) than very hard treads, he explains, while a tread that is too hard (for example, a steel wheel) presents other issues such as excessive noise and

potential damage to floors. All these factors must be taken into consideration when determining the optimum thread, which will depend on the specific application. “When pulling carts as trailers, some friction is necessary to avoid ‘skidding,’ or losing control of trailing carts during turns,” Lippert explains.

While hazards in the warehouse come in all shapes and sizes, Lippert emphasizes that “the overall weight of a loaded cart or trailer may be the most obvious ergonomic factor.” There are finite limits to how much mass a person can physically move without mechanical assistance and ergonomic tools in place, and both the cart and the load weight must be considered when transporting materials. Minimizing the cart weight maximizes the product capacity. “Lighter materials such as aluminum can help to reduce the weight,” he adds, “but may compromise structural strength.” Larger capacity trailers/carts necessitate a heavier structure, and also higher capacity wheels or casters.

Ergonomics Investments

“Prudent design up front can greatly reduce both the ergonomic hazards and labor costs during actual use,” says Lippert.

When investing in equipment geared toward ergonomic safety, it is important to remember the personnel who will actually be using the equipment, potentially on a daily basis or even more frequently. “If the equipment is not adjusted to fit that particular employee, repetitive motion and strain will quickly cause the employee health problems,” says Greg Bates, national accounts manager, Nashville Wire Products. “These health issues lead to loss of work for the employee and expensive health insurance costs for both the employee and employer.

“Manufacturers must purchase equipment that allows for adjustments to fit each employee individually,” explains Bates, as this is “the most critical feature of material handling equipment.” This adjustable equipment can include shelving units or carts that have adjustable shelves, which can be adjusted to a specific person’s height, preventing excessive stretching or bending to reach materials. Some units offer shelving that can be placed at an angle, making it even easier to reach the back of the shelf. “The greatest ergonomic risks occur with strain on the employee if that employee must bend over excessively or reach too far,” says Bates. “Oftentimes, in an industrial environment, the employee is doing this motion repeatedly throughout the day.”

Carts and trailers, while sparing extra steps and additional back strain, can present a more significant investment than shelving options, with price ranging from several hundred dollars to several thousand each. The cost is dependent on size, capacity, complexity, and running gear (wheels/casters), explains Lippert, and the cheapest choice is oftentimes not the wisest. “It is wise to invest well in quality,” he adds.

Cart and trailer options also include built-in tables, such as a scissor lift, or fork guides for safe cart elevation to enhance ergonomic safety and provide more flexibility while preventing injuries. “A staggering percentage of Americans have sustained a back injury of some type during their lifetime,” says Lippert, and

“lifting, bending, and twisting are known challenges to the human body in the workplace.”

Links:
[1] http://digital.impomag.com/impo/september_2013#pg1