

# Ergonomic Industrial Cart and Caster Solutions

BY JEAN FEINGOLD

**W**hen large amounts of materials must be moved within a facility, using industrial carts with casters is the preferred and ergonomically sound solution. An industrial cart with casters is the right choice “in any situation where an operator needs to push/pull light to heavy loads of material or manually pick material where ergonomic stress points are susceptible to being aggravated,” said Terry Parmelee of MHI member Kinetic Technologies.

## Cart considerations

“Standard features for mobile ergonomic focused carts take into account the right caster selection to enable superior push/pull forces for operators as they move material manually throughout work cells,” Parmelee said. It’s important to have an ergonomically engineered handle in the optimal height position so operators can move the material manually and safely. Carts have an open frame or flat base structure to accommodate dunnage, with a tow bar and hitch system if they are tugged on a train.

Special features are available to meet special needs. “Flat deck style carts are the most common and utilitarian,” Parmelee said. Bolt on or welded “riser” decks can be implemented on carts so the material resides at the correct ergonomic height for an operator.

Conveyor/roller deck carts are customized conveyance cart systems engineered for optimal heights to interface with fixed conveyor systems and buffer systems. These are extremely impactful for moving material rapidly and ergonomically to lineside areas, Parmelee said, promoting a seamless and safe transition for operators. Depending on the size and weight of the dunnage, these systems can be used for manual movement on rollers or used with power rollers for heavier loads to avoid ergonomic stress and injury for operators

Lift and lift/tilt systems can act independently or together on mobile carts. “Although typically a cart interacts with a fixed lift pneumatic or hydraulic apparatus on the floor, mobile carts can be designed to have a lift unit in the cart that travels with the cart or cart train,” Parmelee pointed out. The lift enables the material on a cart to be raised to the

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Tilt cart

right height for an operator. Mobile tilt systems, both powered and unpowered, make the decanting of parts a simple process by bringing the material to an ergonomically optimal position for repetitive picking into deep dunnage.

Selecting the right size and type of cart is determined by the size of the dunnage or material being transported, the dunnage’s weight, the optimal height for the operator to remove material, and any special potential ergonomic stress points that may occur by the movement or decanting of material. “Carts can be engineered for an operator to handle thousands of pounds, but, if manually moved, the typical capacity would be in



PHOTO: DARCOR LIMITED



PHOTO: DARCOR LIMITED

Kingpinless styles of casters are engineered to take on the toughest industrial challenges. Above is a single-wheel Kingpinless caster. Many systems are capable of being adapted to dual or triple-wheel (on the right) configurations. A triple-wheel system increases the load capacity and vastly enhances the ergonomic mobility performance compared to its single-wheel cousin.



PHOTO: KINETIC TECHNOLOGIES

Flat deck cart with raised deck for optimum operator ergo height.

the 2,000 to 2,500 pound range before needing some form of powered assist,” said Parmelee.

All of these applications can be engineered for towing on a tugger train and moved throughout a plant. When detached from the train, these carts are

ergonomically designed to be pushed easily into a work cell by an operator.

### Caster considerations

In selecting casters, their ergonomic properties are key. Look at the offset, where the center of the caster is

**“Selecting the proper wheel material and caster will significantly reduce peak forces, in some cases over 50 percent.”**

—Lui Dilauro,  
Darcor Limited

in relation to the center of the wheel. “The greater the offset, the less the peak forces or swiveling force,” explained Lui Dilauro of MHI member Darcor Limited. Wheel material has the greatest impact. Since sealed bearings are used throughout the industry, bearing selection is less significant.

“The best caster for ergonomic performance is first based on the organization’s objectives,” Dilauro said. “This is generally determined through a caster audit performed by a mobility expert.” Some users may be more sensitive to

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