

Material-Handling Equipment

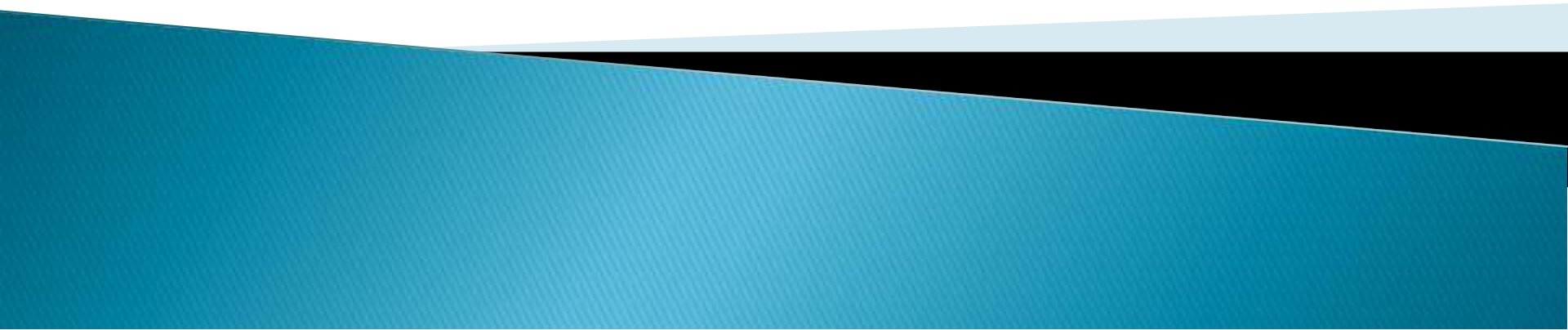
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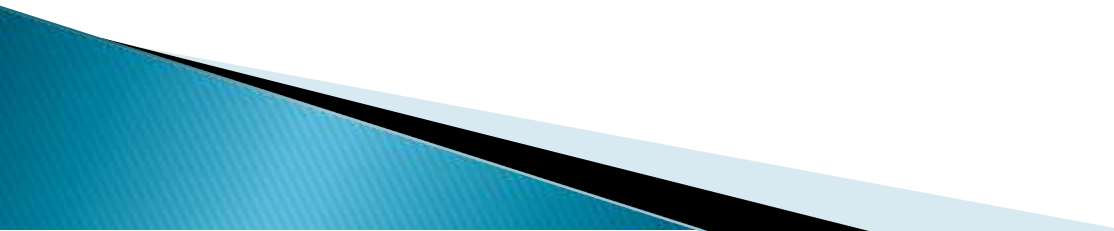


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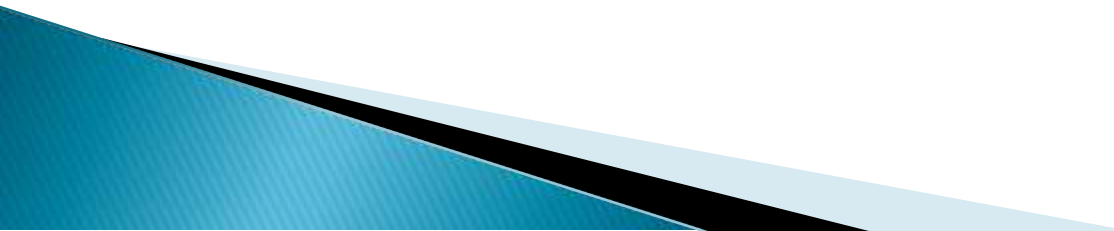
Mechanical equipment used for the movement, storage, control and protection of materials, goods and products throughout the process of manufacturing, distribution, consumption and disposal.




Types of Materials Handling Equipment

- ▶ **Storage and Handling Equipment**
 - ▶ **Engineered Systems**
 - ▶ **Industrial Trucks**
 - ▶ **Bulk Material Handling Equipment**
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Storage and Handling Equipment

- ▶ Storage equipment is used to hold materials while they wait to be transported from the manufacturer or wholesaler to their final destination.
 - ▶ Having the right storage equipment can increase efficiency on the production floor and maximize space utilization– two very important factors in any production environment.
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Examples of storage and handling equipment include

- **Racks:** such as pallet racks, drive-through or drive-in racks, push-back racks, and sliding racks
 - **Stacking frames:** these are interlocking units that enable stacking of a load so crushing doesn't occur
 - **Shelves**
 - **Bins and drawers**
 - **Mezzanines:** elevated floor systems that are installed between the production floor and ceiling in order to provide additional storage space. Most of these structures can be dismantled and moved with ease.
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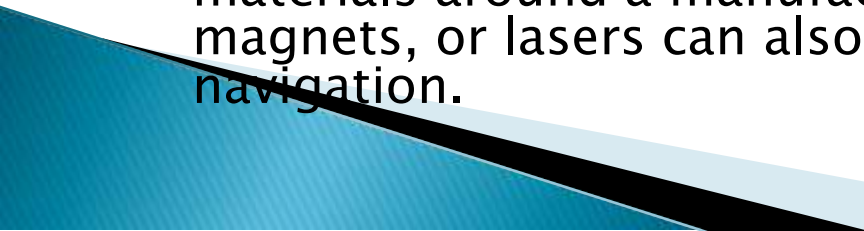


Engineered Systems

- ▶ Material handling equipment are typically automated units that work together to enable efficient storage and transportation of large materials or large volumes of materials around the production floor.




Examples of engineered systems include:

- **AS/RS:** Automated Storage and Retrieval Systems (abbreviated as AS/RS) are large automated structures that involves racks, aisles and shelves that are accessible by a type of mechanized shuttle system (like a cherry picker) for the quick retrieval of items.
 - **Conveyor systems:** Automated conveyor systems carry heavy materials to specified destinations using belts, flexible chain, or live rollers. It is a highly efficient equipment to move large volumes of material quickly.
 - **Robotic delivery systems**– These automated systems are ideal for moving products on an assembly line or transporting goods throughout a plant or warehouse.
 - **Automatic guided vehicles**– These vehicles are mobile robots that follow specific markers or wires in the floor to move large materials around a manufacturing facility or warehouse. Vision, magnets, or lasers can also be used as methods for AGV navigation.
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Industrial Trucks

- ▶ Powered industrial trucks, such as forklifts, are used to move large materials or large quantities of materials around the manufacturing floor.
 - ▶ They are also utilized to efficiently load (or unload) heavy objects onto delivery trucks.
 - ▶ Industrial trucks are very useful when there is insufficient flow volume to justify the implementation of a conveyor system.
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Examples of industrial trucks include:

- ▶ • **Hand trucks**– Also known as a dolly, or box cart. Hand trucks are I-shaped box-moving handcarts with handles at one end, wheels at the base, and a ledge to set objects on.
- ▶ • **Pallet jacks**– These are tools are the most basic form of a forklift and used to lift and move pallets within a warehouse.
- ▶ • **Pallet trucks**– Manual operated or powered industrial forklifts
- ▶ • **Walkie stackers**– A pedestrian walk-behind stacker with a mast for lifting pallets to heights.
- ▶ • **Platform trucks**– These are similar to a two wheeled dolly, but with an extended deck.
- ▶ • **Order picker**– An electric lift truck specifically designed for filling individual customer orders. This requires piece-part picking rather than selecting full pallets or unit loads.
- ▶ • **Sideloader**– Automated tool similar to a fork lift that loads and unloads from the side of the machine rather than the front.



Bulk Material Handling Equipment

- ▶ Equipment that deals with bulk handling aids in the control and transportation of large volumes of material either in bulk or loose form.
- ▶ In general the equipment is used to move loose parts from one area of the production floor to another.



Examples of bulk material handling equipment are:

- **Conveyor belts**
 - **Stackers**– Similar to forklifts, stackers help to lift and stack heavy loads on the dock or in the warehouse.
 - **Reclaimers**– These are large machines used to recover bulk materials from a stockpile.
 - **Bucket elevators**– Also known as a grain leg. These elevators haul flowable bulk materials vertically.
 - **Grain elevators**– This type of equipment is used to store and move grain and other similar materials throughout a production pathway.
 - **Hoppers**– Hoppers are a container for bulk material such as grain, that tapers and discharges it's materials at the bottom.
 - **Silos**– A tower used to store grain and other materials such as coal, sawdust, woodchips, and food products.
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