

CASE PICKING SYSTEM

Case picking system can be classified in

- Pick face palletizing systems
- Downstream palletizing systems
- Direct loading systems

Pick face palletizing systems

In this system picker palletizes at the pick face during picking tour. Usually are used

- pallet jack,
- pallet trains,
- lift truck picking,
- order picker trucks.



Pallet jack picking

The operator rides on the back of motorized vehicle with forks (single or double pallet).

This is the most popular method of case picking, especially in grocery industry.

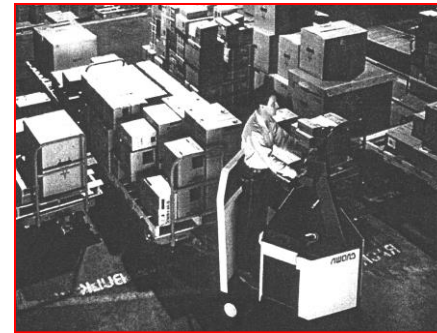
Investments are low, simple concept, flexible.

Typical rate is 150-250 cases/PH



Pallet trains

The train of pallets can be pulled behind motorized vehicle to further increase the number of pallets or orders on a case picking tour.



Lift truck picking

Lift truck could be used for simplifying the case picking operations. It is possible because the forks can be used to keep top level of the pallet near the operator's waist level, to move at high speed over long distances in the warehouse and to load outbound trailers.

Order picker trucks

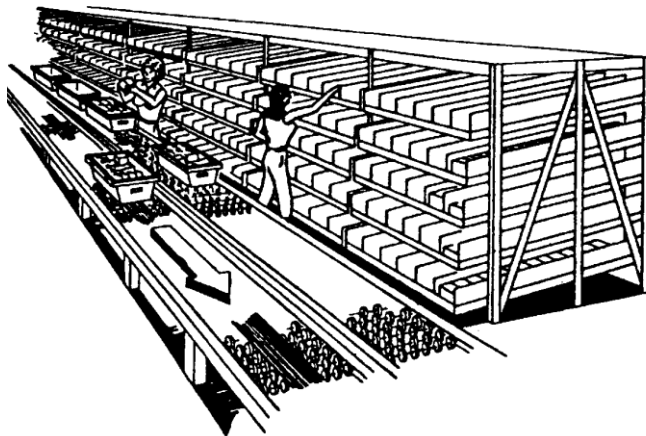
Order picker trucks enable the order picker to travel to pick location well above floor level. Vertical travel is much slower than horizontal travel and operator must take special care in positioning the vehicle so the productivity is only 50 to 100 cases per PH. They are used for slow moving items and where high density storage required.



Downstream palletizing

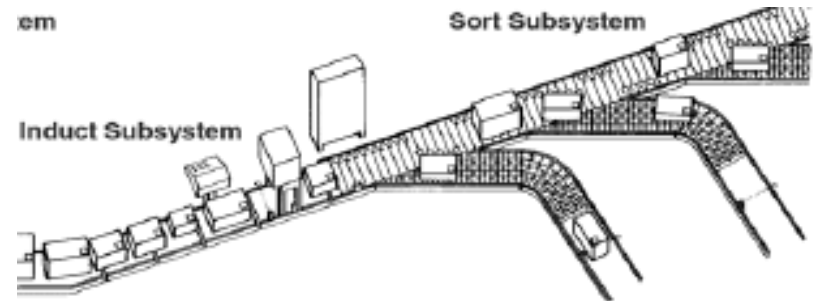
Typically called ***pick to conveyor operation***, where conveyor runs the length of the case picking line, enabling the order picker to walk down the line removing cases and placing them on take away conveyor.

Advantage is substantial increase in picking productivity, picker is confined to zones, eliminating order picker palletizing as they pick. Disadvantage is need for downstream sortation and palletizing system.



In most pick to conveyor systems cases must be sorted into outbound orders before they are palletized or loaded directly onto outbound trailer.

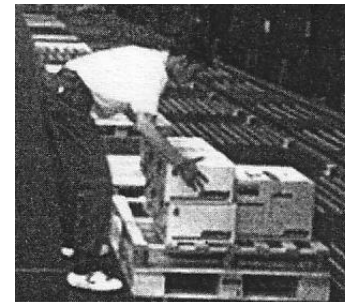
There are a lot of technical solutions that can be used in conveyor system to divert labeled cases into their appropriate accumulation line.



Palletizing system

Once picked, cases can be palletized manually, mechanically or robotically.

Manual palletizing is often only technically or financially feasible alternative. Palletizing could be more or less complicated and hard task, depending on the variety of carton's dimensions, weight etc. that have to be loaded on the pallet.



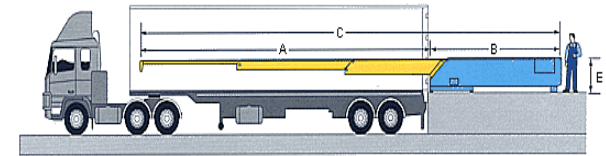
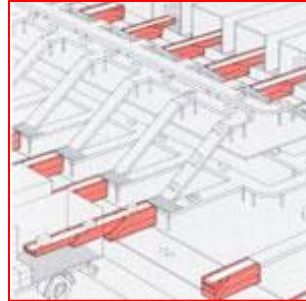
Mechanical palletizing are faster and safer than manual systems, but they are much more expensive and cannot work with range of cartons sizes that manual palletizing system can.

Robotic palletizers can service a variety of shipping pallets at time, but they are not fast as mechanical palletizers.



Direct loading systems

When cases do not need to be palletized for shipping, they can be conveyORIZED directly into outbound trailers.



SMALL ITEM PICKING SYSTEM

The mayor types of broken case picking systems are

- *Picker to stock* (where order picker walks or rides to the picking location)
- *Stock to picker* (where stock is mechanically transported to a stationary order picker)

and

- *Automated picking systems* (where items are automatically dispensed into shipping cartons or totes)

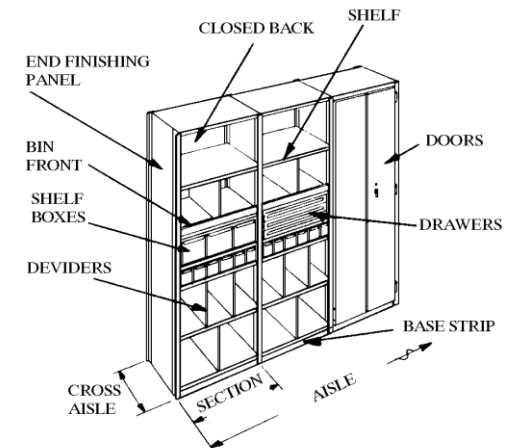
Picker to stock systems

In this systems, the order picker walks (seldom rides) to the picking location. So, two subsystems are involved - storage system that houses the stock and item retrieval system.

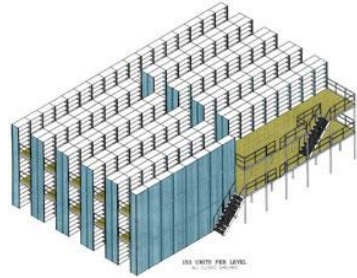
Picker to stock STORAGE systems

The most popular picker to stock storage systems are: bin shelving, modular drawers/cabinets and gravity flow racks.

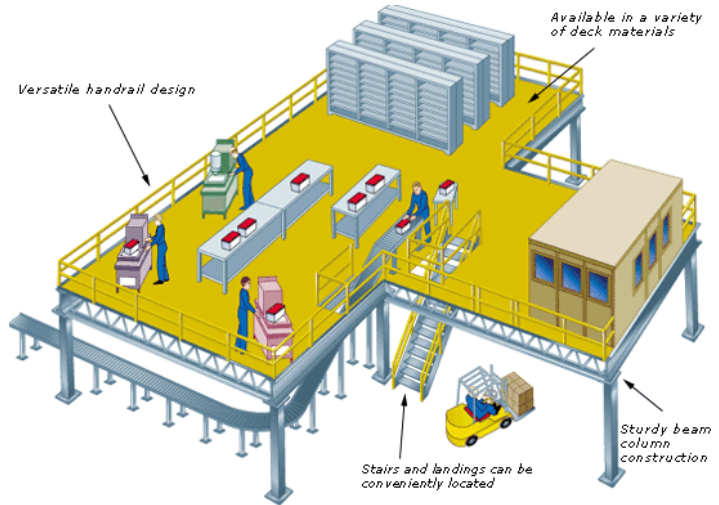
Bin shelving systems are the oldest and still the most popular equipment for small parts storage and order picking. This systems are inexpensive, (almost) easy to reconfigure and with less maintenance. But, there are lower space and labor utilization. The height is limited so the necessary area increase and people have more to walk. One solution for better space utilisation are mobile racks. Also, protection and supervisory problems are occurred.



The solution for achieving better space utilization also are **mezzanines**. They could be more floors high



Material flow between floors could be realized in different ways



Modular storage drawers

The primary advantage over bin shelving is a large number of items that can be stored and presented in small area. Also, primary accuracy and protection from environment is improved.



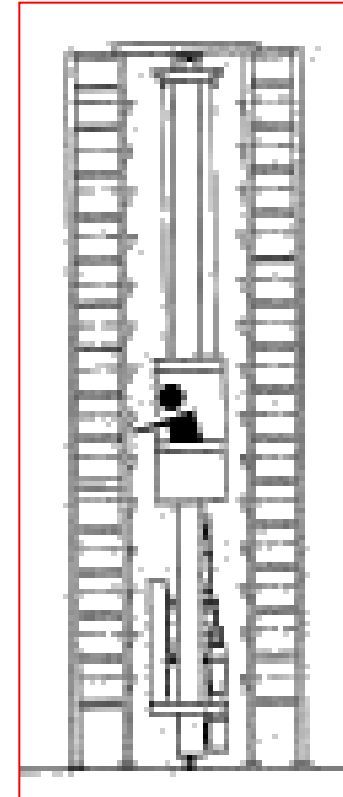
Gravity flow racks

They are typically used for SKUs with high broken case cube movement and that are stored in fairly uniform size and shape cartons. Cartons are placed in the back of the rack from the replenishment aisle and advance/roll towards the pick face as cartons are depleted from the front (with FIFO turnover).



Picker to stock RETRIEVAL methods

Picker to stock retrieval methods include a variety of equipment – different types of picking carts, tote picking, man aboard systems and also robotic item picking.



Stock to Picker Systems

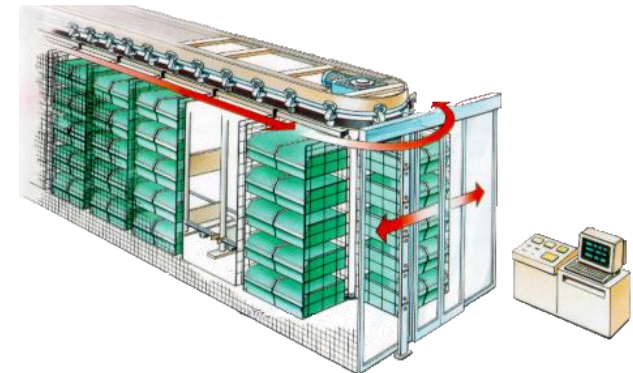
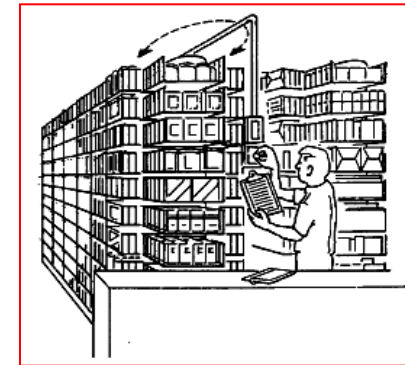
There are two major types of stock to picker systems: *carousels* and *miniload AS/RS*. Advantage of this systems is the elimination of the travel time for the order picker, what could be satisfied when wage rate is high. Also, supervision is another advantage of stock to picker system – all of operators should be visible to a supervisor as a picking takes place at the end of the aisle.

Carousels

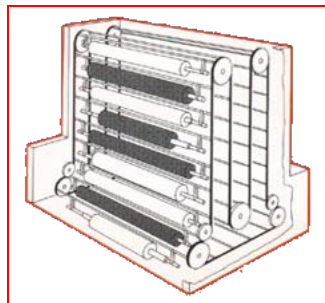
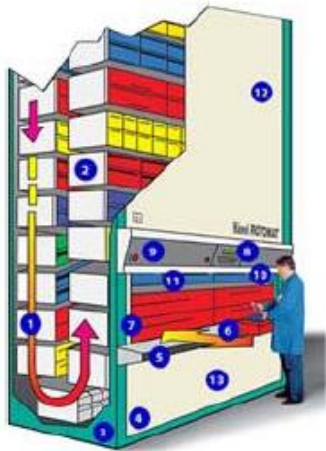
They are mechanical devices that house and rotate items for order picking. Horizontal and vertical carousels are popular for order picking applications.

Horizontal carousel is a linked series of rotating bins of adjustable shelves driven by the motor unit. Items are extracted by order pickers who occupy fixed positions in front of the carousel(s). Moving is controlled manually or by computer.

Horizontal carousel vary in length from 4 to 30 m and in height up to 7,5 m.



Vertical carousel is a horizontal carousel turned on its end and enclosed in sheet metal. It could be controlled manually or by computer.



Miniload AS/RS In this systems an automated AS/RS machine travels horizontally and vertically in a storage aisle, transporting containers (miniloading) to and from an order picking station located on the one end of the system.

