Type of Rackings

◆ Selective Pallet Racking
◆ Drive In / Drive Thru Pallet Racking
◆ Very Narrow Aisle Pallet Racking
◆ Double Deep Pallet Racking
◆ Push Back Pallet Racking
◆ Flow Thru Pallet Racking
◆ Powered Mobile Pallet Racking
◆ ASRS Pallet Racking
◆ Cantilever Racking
Selective Pallet Racking

The simplest of all Pallet Rack Storage Systems provides access to every pallet. Low cost equipment can be used offering simple adjustability and adaptability. Storage density is low as many aisles are necessary.
Drive In / Drive Thru Racking

Forklift trucks drive into lanes on racking specially built to provide support to the pallet along the pallet sides. Stacking often to 10 meters high and 4 to 5 but occasionally even 10 deep. This system can provide very dense storage capacity, often low n access and rotation of products. As the truck enters the racking, special precautions apply to ensure the compatibility of design between the truck, pallet and load and the racking. Flat floor is advantageous.
Very Narrow Aisle Pallet Racking

Specialized high Materials Handling Equipment (MHE) operating in very narrow aisles providing high density and individual pallet access. Very flat floors required. Wire Guidance or Guide Rails in the aisles is mandatory. Lift trucks height of 15 meters with man-up capability available.
Double Deep Pallet Racking

Reach stackers equipped with pantograph forks allows racks are setup back to back of four pallets deep. This reduce the aisle to rack ratio but also reduce selectivity, (FILO). Reach stackers with heights up to about 12 meters are available.
Push Back Pallet Racking

Conventional forklift trucks load pallets into inclined telescopic magazines in the racks for storage. The pallets return automatically to the front of the rack by gravity once a pallet is retrieved. By retrieving from the front of the rack, pallets are stored on a FILO basis. The system offers safe and dense storage for 2, 3 and 4 deep pallet storage. Typically up to 5 pallet high.
Flow Thru Pallet Racking

Pallets are supported on inclined gravity conveyors so that the pallets travel automatically from the loading side (high side) to the unloading side (Low side) of the racks. It provides automatic "first in, first out" (FIFO) stock rotation and rapid throughput and with most installations over 10 pallets, deep space utilization is excellent.
Powered Mobile Rack

Comprises conventional pallet racking mounted on steel framed bases fitted with electrically driven wheels running on tracks set into the floor. This enables adjacent runs of racking to be closed up to one another. An operating aisle can be opened up wherever necessary to give access to the required rack face.
Automated Storage/Retrieval Systems (ASRS)

Automated Storage and Retrieval System (ASRS) as the name suggest that it is a fully automated system. Automated order-picking machines / cranes operating within a very small footprint and it can go as high as 40 meters. ASRS are integrated with the Warehouse Management Systems and Material Flow Control Systems.
Cantilever Racking

Primarily used for the storage of long loads such as steel stock, pipes and timber. It comprises uprights with cantilever arms which give an unrestricted rack face. Conventional handling equipment trucks usually serve the system which can also be mounted on mobile bases to further improve floor space utilization.
Types of Racking Use in PTCL

- Selective Pallet Racking
- Very Narrow Aisle Pallet Racking
- Double Deep Pallet Racking
- ASRS Pallet Racking
Rack System Selection Criteria

1. Types of Cargoes (Homogeneous / Non Homogeneous)
   • Mainly comprises of Drums / Pails / 25 kg Bags / Bulk Bags / Cartons (Homogenous)
   • Refinery Spare Parts (Non- Homogenous)

2) Cargo Weight
   • Always consider the heaviest load among the cargoes that you handle.
   • Recommend to install higher capacity racks to cater for all goods.
   • Discourage installing different SWL racks within a facility as operators might use the wrong racks.
Rack System Selection Criteria

3) Volume Throughput & Picking Strategy (FIFO / FILO / FEFO etc)
   • To select the correct rack system.
   • Make put-away and retrieval process more efficient.
   • Reduce manpower.

4) Floor Loading
   • Ensure floor can withstand the rack configurations you intend to install.

5) Clearance Height
   • Consider regulatory height limits for rack storage
   • Avoid lightings and sprinklers.

6) Business Strategy
   • Space Optimization or Ease of Operations
Common Problems Faced & Solutions

1) Upright of the racking knock by the Reach-trucks.

Solutions:
• Thus it is necessary to cater the right aisle width to minimize this occurrence.
• Install rack guards and safety barrier to protect the upright from impact.
• Conduct periodic visual inspection on the racks.
2) Safe Working Load (SWL) of beams not cater to the weight of goods.

Solutions:
- To mark the SWL on the physical beam for awareness.
- To always add in the pallet weight to the cargo weight.
- To use higher capacity beams i.e. 3 tonnes instead of 2 tonnes beams.
Common Problems Faced & Solutions

3) Goods not placed evenly on the racks. This can cause the pallet to drop into the racks during picking operations.

Solutions:
• Educate operators on the correct positioning of the pallets.
• Install support beams and cross braces to curb this problem.
• Put small odd size pallet onto a proper size pallet.
• Use Lift trucks that are equipped with height selection functions.
Install Video Cam on Reach-trucks to assist Operators to see better for high pallet position
4) Reach Truck are electrically operated. Thus they are very quiet when moving within the warehouse. Racks create many blind spots within the aisles. So pedestrian walking into the warehouses must be cautious of moving Reach-trucks.

Solutions:
• To implement a traffic management system in the warehouse.
• To install safety gadgets that can help to pre-alert pedestrians of on-coming traffic i.e. blue-light system, reversing beeper, blind spot mirrors, warning signage etc.
Common Problems Faced & Solutions

5) Floor loading should be taken into consideration when installing of racks.

Solutions:
• To discuss with rack manufacturer and provide the range of cargo weight intended to be stored on the racks.

6) Cargo placed on the top tier of the rack is too close to the ceiling. This can cause damages to the sprinkler system and also obstruct the water dispersion should the sprinkler is triggered. The cargoes might be very close to the ceiling lightings and can cause damage to the cargoes.

Solutions:
• To discuss with rack manufacturer so as to come up with the suitable configuration for your racks.
Common Problems Faced & Solutions

7) Reach Truck are not the correct equipment to use for stock counting for racks storage.

Solutions:
- Operators should attend the ‘Work At Height’ course.
- Fall Control SOP must be in place.
- Proper PPE to be worn while working at height i.e. Safety Harness
- Proper equipment i.e. Scissor lift should be use to conduct stocktaking.
Thank You