

Key factors that need consideration before implementing Pallet Shuttle

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Well begun is half done as the saying goes. The same is true while making a decision to implement pallet shuttle in a warehouse storage setting. The decision to implement pallet shuttle makes the job half done, but how to implement it will lead to another important part of the question, which requires careful thinking. It is important that the solution should last long, sustain the rigour of operations, and achieve the required throughput along with achieving highest safety standards. For all this, there are some important check-points to be verified before implementing the system and we would like to ponder over them.

Planning is Everything: The basic floor plan needs to consider such things as location of receiving and shipping docks, where the staging areas are, the racking vendor and layout, pallet shuttle, budget, and



timelines for the whole project... etc.. While allocating budget during investment decision, it is very important to work out a cost benefit analysis. One should keep in view that the best solution need not be the cheapest solution. Investment made should be able to justify by working for a long period without having to make frequent changes to adapt to increasing demands of storage and throughput.

In case of a greenfield project it is recommended that the height of the structure needs to be built keeping in mind the scalability and future requirements.

Let's divide the pre-requisites into 3 major components:

i. Pallet Racking System: Pallet Shuttle runs in specially designed rails supported by pallet racking frames fitted with special support beams. Clearance above load and opening are kept in such a manner so that space can be utilized fully. Entry width can be adjusted to suit various kinds of loads. Before installing the racks, it is important to ensure that industrial flooring with appropriate specifications, finish and grade is laid out. Key points to inspect are:

- **Floor Levelling:** Civil construction anomalies cause levelling differences on the floor anywhere between 2mm to 10mm. This surface unevenness can lead to excessive vibration on lift trucks while moving, gaps at the joints of the rail/track which leads to early wear and tear of the shaft and wheels of pallet shuttle. In fact, these levelling differences make the whole system unstable. **So, it is essential to carry out a compliance check of floor levelling as per FEM 9.831 standard.** Within the permissible limits, we use "simplets" to make the flooring even, thereby ensuring the entire racking structure would be sturdy.
- **Floor Capacity:** The second most important thing to be considered is the **floor capacity, which plays a key role in deciding the number of levels a warehouse can accommodate.** In a dense racking system using pallet shuttle the height of the racking can go up to as high as 15 meters. So, to **decide the number of levels the criteria of point load or per square meter load must be measured accurately.**
- **Seismic Zone:** While building the entire system, seismicity of the zone needs to be considered and accordingly the design of racking structural members, dimensions & supporting systems must be carried out. In a seismic zone of 4 and 5 classification, the thickness of the upright, width, supporting systems like bracing structure, densely inter-twined side beams.. etc will essentially play major role in finalizing the layout and design.
- **Channel end Stopper:** At the beginning and end of the rail channel, stoppers have to be installed to prevent the shuttle overriding from its end stop position.
- **Sprinkler System:** Roof / In-rack sprinkler system needs to be implemented as a best practice to prevent chance of fire mishaps within the storage system.
- **Forklift fenders:** Guards for the racking system to prevent bumping of forklift on to the racking system.

ii. Pallet Shuttle: Pallet Shuttle facilitates movement & storage of pallets in the dense racking system. Simple instruction will be sent to shuttle by operator using the remote-control unit. The shuttle checks the dimension of the pallet load and aligns itself at the assigned point before lifting and moving the load. After placing a pallet in the channel at the predetermined position, usually the last empty position in the channel, shuttle will automatically return to the front face to receive the next load. The same is applicable in case of



retrieval assignment, where shuttle finds the first pallet in the rail & brings it to the front of the channel to feed the forklift. Absolute LIFO/FIFO options could be configured.

- **Supply Chain Integration:** Any automation solution needs to be integrated with the existing systems for seamless functionality. In case of pallet shuttle, it is important to establish a communication protocol with

the right parameters among all the inter-connected systems like Pallet Shuttle PLC system, WCS, WMS/ERP system.

- **Peripheral Equipment:** VMT (Vehicle Mounted Terminal) may need to be implemented with the ERP system to make operating process smooth, efficient and paperless.

- **Reach Truck selection:** Reach trucks come with various features like advanced auto level settings, sound alarms, vision system. etc. Throughput, number of levels, and the overall project budget are to be kept in mind and accordingly suitable reach truck need to be finalized.

- **Vision System:** In cases where the racking system is beyond certain limits of height, forklifts with integrated vision systems are employed. This vision system facilitates ease to fork lift operator to see the racking and load beyond normal eye level for better placement of shuttle/load.

- **Storage Pattern:** The higher one goes the longer the operation cycle time. Hence fast-moving items should be kept at the entry of the aisle which facilitate quick retrieval and not sacrifice retrieval time.

iii. Safety:

- Cautionary signs, safety notices and fire suppression/first aid equipment must be placed in work areas prone to accidents, thus preventing mishaps by sensitizing peoples working in and around the system. These MUST also be in accordance with the applicable codes of the city, county and federal regulations. It is always a good practice to have these caution and sign boards in local spoken/read language to increase the acceptance.

- **Limit switches:** They ensure the movement of shuttle car within battery limits.

- **Persistent Speed Monitoring System:** This will ensure that the shuttle runs constantly at the programmed speed, this feature will help the shuttle work satisfactorily as per design norms.

An automated Pallet Shuttle naturally places high expectations on account of throughput and efficiency. An extensive analysis of your inventory characteristics, storage pattern, safety requirements & local regulations will provide many views on the automation prerequisites, thereby helping to achieve enhanced operational parameters. A competent and experienced team of experts will aid in achieving better project planning, design, procurement of all systems and execution of a Pallet Shuttle project.

Being the largest selling pallet shuttle company in India, we bring a diverse and wide industry exposure in implementing a pallet shuttle system.

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