Managing Warehouse Storage Space Successfully

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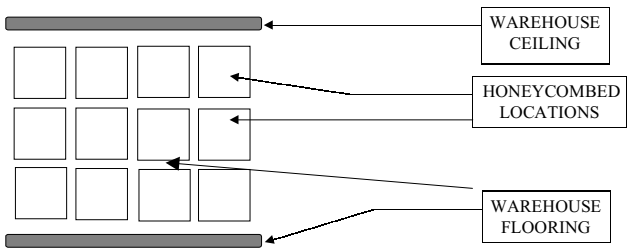
City development has always been a source of wonder and admiration. The way property prices zoomed upwards worldover in the last two decades, reaching astronomical heights has left ordinary people, businesspersons, town planners and realty dealers, silenced and gasping in awe. In such tiring situations, planning takes precedence to achieve inventory levels that would optimise use of limited available warehouse space. Although this may seem impossible, proper planning will definitely help one to find a way to achieve it. Many storage alternatives exist, but the philosophy that helps guarantee the best use of the limited available storage space is the need of the hour.

Popular storage systems that are available, include selective rack, pallet flow rack, drive through rack and bulk/block stocking storage systems. Each system has its merits and demerits. A system may have a better selectivity and 'first in first out (FIFO)' controls, but the investments required to implement would be generally higher, with space utilisation and flexibility of operation, less than optimised. Sometimes physical constraints of the warehouse building and storage container may play havoc to make these storage systems non-functional. Of these different systems, block stocking of the unit load is considered today, as the optimal storage philosophy in most godowns and distribution warehouse. In a block stocking, each unit load is stacked on top of another and stored on the floor in a block formation, also called as storage lanes. These blocks are generally two blocks deep, but in some cases may also be ten blocks deep. The height of the stacks, may range from two loads high, to a height that is considered and acceptable to be safe. The height will necessary depend upon the weight, the stability and fragility of the load, the loading vehicles lift height capacity and the warehouse building height.

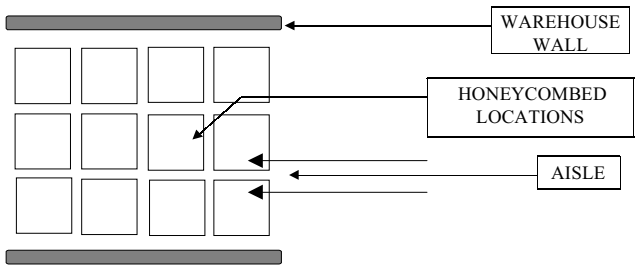
In any storage system the space required depend on the volume of the storage material and the use-of-space characteristics involved in the selected alternative. The important use-of-space characteristics, are "Aisle allowance" and "Honey combing allowance." By "Aisle allowance" we mean the percentage space occupied by aisles within a storage area (viz., Aisle area ÷ Total area). "Honeycombing allowance" is the percentage storage space lost due to ineffective use of the total available storage space, occurring when a multi-unit storage block is partially occupied by the material. The honeycombed space is the unoccupied area and is the result of the operational philosophy that once a material is removed for dispatch from one storage location, the space can be occupied only by the same product or lot number. This philosophy is followed to prevent locked stock that occurs when access to a particular "Stock keeping unit" (SKU) is physically difficult to approach as it is blocked by an other SKU.

Side view of block stacks



Having decided to block stock inventory, the next important step is to determine the optimal depth of the lane for storage. Different lane depth will improve utilisation of available space to the maximum extent, with overall improved labour efficiency.

Top view of block stacks



For warehouse planning purposes the different class or categories, the product belongs is first considered. Considering product categories and transaction frequencies, the number of block positions and lane depth is decided. If a small variety of products is to be stored with a high throughput, then space-use is more important than product selectivity. In this case, the block storage area will look like in Fig 1. However, if a large variety of different types of products is to be stored, with comparatively lower throughput, then selectivity is more important than space-use. The block storage area in this case will resemble as Fig 2.

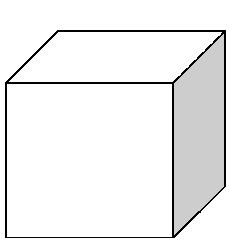


Fig. 1

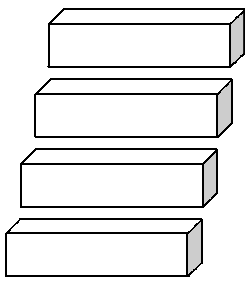


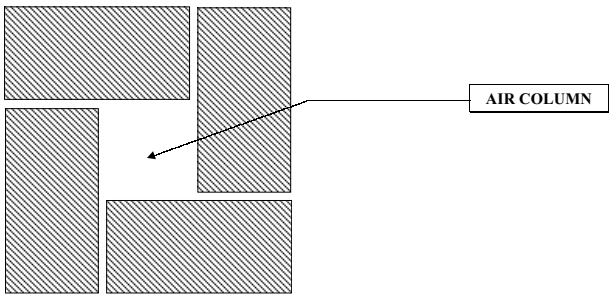
Fig. 2

Class I items are generally defined as those 20% of SKU population that constitute the top 80% of the activity or transaction. Class I items have, small variety of products but very high throughput. Class II items make up the next 15% of the activity and are generally generated by 30% of the population. The last 5% activity belongs to class III items, represented by the remaining 50% of the population. Class I items are usually referred to as the "Vital few" items and Class II and Class III items as "Trivial few".

As discussed earlier, if activity is the lone factor to determine lane depth, then the design will be skewed to accommodate the Class I items as they will represent 80% of the total activity in the warehouse. In this design (Fig. 1), the Class III items will become locked stock. Thus, benefits achieved by this system in space utilisation will be lost, due to reduced product accessibility. Moreover, time and labour to gain access to Class III items will increase, as they become buried within the lanes. Inversely, if population is used as a basis for designing lane depth, then the layout resembling Fig. 2 will give very good product accessibility, but will result in poor space utilisation, due to a large number of lanes. It is important that each class is independently looked at, before determining and finalising lane depth. Class I items are generally stored in deeper lanes, while items belonging to Class II and III are stored in shallower lanes, to increase product accessibility. It is only by analysing each class of products separately, that one could determine the optimum lane depth, resulting in increased space utilisation and selectivity, with reduced incidence of unwanted honeycombing. While analysing each class of products it is important not to overlook defined parameters, namely stock height, load width, load depth, aisle allowance, etc., if one has to provide the best space utilisation, across different inventory levels. Apart from maximum space optimisation, a clean surrounding and good hygiene is also of paramount importance in a warehouse. In case the warehouse is attached to a production site, it becomes necessary to plan manufacturing so as not to accumulate stocks for a long time. Home and personal care products stored for a long time have greater chances of becoming contaminated with mould and fungus. This risk is all the more particularly when stocks are stored for more than a month especially during monsoon. Damage to the outer packaging increases mould and fungal growth and should be avoided.

All godowns and warehouses are highly prone to fungal and mould growth. It is therefore necessary that warehouses are well ventilated to maintain ambient temperature and low humidity levels. To maintain a good ventilation, it is preferable to have air vents at roof level, rather than at the walls. Forced circulation of air, by use of electrically driven system of fans is preferred. Boxes containing home and personal care products should be stored, at least 50 cm., away from the walls and from adjacent stacks to ensure proper ventilation. Stacking in a honeycombed pattern on pallets with a minimum gap of 5 cm., between each box, ensures good ventilation, and prevents dampness arising through the warehouse flooring onto the pack.

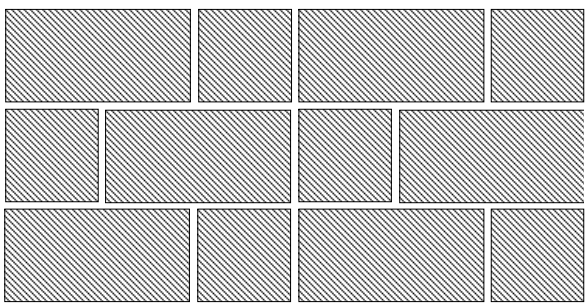
Top view of cartons stacked in honeycomb pattern



FIFO operational philosophy must be adopted for products stored for a longer time than normal. Regular inspection and, if necessary, restacking of the product boxes is to be carried out, to rule out the possibility of fungal or microbial growth. Not having pallets, the floor may be covered with a polythene sheet to make it impermeable to moisture from the warehouse flooring. Godown flooring should be made of stone or cement concrete, with the flooring at the entrance, a little higher than the rooms. This will prevent water from seeping inside the warehouse from outside, especially during the monsoon.

Leaks in roofs or walls should be checked at regular intervals and repairs carried out, in case of any defects. Warehouse should be cleaned regularly to destroy mould spores using a sanitiser like hypoclorite. Pallets and flooring should be cleaned after the product lot is removed for despatch. Insecticides (to control pests) should be used to protect the stored packs and to prevent spread of mould spores in the warehouse. Proper care should be taken to maintain low humidity levels, as high humidity condition helps mould growth. In cases where mould growth is foreseen, extra care is to be taken to stack products in a manner that ensures through ventilation, so that air passage is not restricted in any way.

Side / frontal view of cartons stacked in a honeycomb pattern



To conclude, we can say that, basic warehousing philosophy and block stocking arrangement can help make the best use of the available space, preventing the warehouse from becoming an inefficient black hole for stock keeping.