

Calculating Your Ideal Storage Utilization



*A Guide to Balancing
Storage Space with
Workflow Efficiency*



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The Storage Utilization Factor (SUF) is one of the least understood terms in warehousing. As such, it is also one of the principles of warehousing that causes more operational problems for companies.

With the ebb and flow of product storage, the challenge is finding the ideal balance between maximum storage space and operational efficiency.

In this publication, we will discuss the concept of optimal storage utilization and how to calculate the ideal percentage for your facility and rack type.



1. Cube Utilization

“Cube utilization” is an industry term that refers to the amount of the total available space of a facility or a truck that is actually utilized. This space is expressed as a percentage. When a space is completely filled with product, the cube utilization is said to be 100 percent. This term is often used to describe a trailer when no more product can fit in it.

However, the reality is that, within a warehouse or distribution facility, as your utilization nears 100 percent, productivity within that space begins to fall. There is no room to effectively move, arrange or access product. The goal is to determine the optimal Storage Utilization Factor (SUF) that can provide for both fluctuations in inventory balances and honeycombing, while not having an excess of unused space.

2. Extra Spaces for Inventory

Part of the SUF allowance is to provide extra storage spaces above the normal or planned inventory levels. A distribution center cannot operate efficiently if 100% of the pallet storage slots are occupied. Lift truck operators lose productivity when they must search for an available slot or need to constantly consolidate partial pallets of the same stock-keeping unit (SKU) to create an empty storage slot.

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3. Extra Spaces for Honeycombing

The second part of SUF is providing empty spaces for “honeycombing,” the term for partially filled pallet slots. For example, if there is one carton left on a pallet in a particular storage location, that location is not readily available to store other pallet.

And while pallets can be consolidated, this takes extra time and reduces productivity. For this reason, leaving a certain percentage of empty positions actually increases efficiency.



4. Finding Your Storage Cube Size

The first step in calculating the storage cube size in the warehouse, is to measure the footprints of each pallet rack and calculate their total vertical storage capacity. Then multiply the true capacity of each rack by the total number of racks in your warehouse. This will give you the size of the storage cube. Most warehouse space storage cubes are between 22% and 27% of their storage capacities.

EXAMPLE:

With a 1,500,000 cubic foot warehouse, a storage cube between 330,500 (22%) and 405,000 (27%) would be normal.

If your storage cube size falls outside this range, it could indicate a potential problem in your warehouse space layout. If your storage cube size is larger, you risk having high labor costs since your employees will not have much room to efficiently move around the warehouse for restocking & picking. If your storage cube size is smaller, you may be using space inefficiently.

This calculation gives you the total potentially usable space.

Next, we will look at how much of that space should actually hold product at any one time.



5. Recommended Utilization Factors

Each type of storage – bulk, selective rack, double-deep rack – has a different SUF that must be accounted for in the design of a storage system.

For single-deep pallet rack storage, Steel King recommends planning for no more than 90% utilization at peak inventory levels. However, the storage utilization factor varies from one type of rack to another. The SUF for the most common types of storage is in the chart below.



6. Storage Utilization Recommendation

For Every 100 Pallets of Inventory	Storage Utilization Factor (Average – Peak)	Pallet Positions Needed per 100 Pallets*
Single Deep Rack	85 - 90%	111 - 117
Double Deep Rack	70 - 80%	125 - 143
Bulk: < 3 Deep, 3 High	70 - 75%	133 - 143
Bulk: > 3 Deep, 3 High	60 - 70%	143 - 167

** Note: to calculate the full number of extra spaces for each storage type, divide the number of pallets of inventory by the utilization factor.*

7. Seasonal Variations

While the suggested percentages are not exact, they can provide a useful guideline for most situations. There are times when your SUF will be above the recommended storage allowances. This may happen during seasons of peak inventory or for storage of large quantities of obsolete or seasonal inventory that seldom needs handling.

If seasonal peaks are brief, it may not pay to expand. However, if you are frequently moving pallets into or out of the storage area and it is hurting your efficiency, it may be time to plan for extra space.

8. Alternate Rack Solutions

You may find that your inventory fall outside of the “normal” parameters. If you warehouse a high volume of same SKUs, you can reduce aisle space and increase product density with deeper storage alternatives, such as drive-in, pushback, gravity flow rack, or even an automated shuttle system.

As the nation’s only manufacturer of a full-line of racking types, Steel King has a rack engineering team qualified to design the rack system that is best for your facility. We design and manufacture selective pallet rack, drive-in, gravity flow, pushback, cantilever, portable and shipping racks, plus advanced rack systems for distribution and automated systems, and our team holds engineering licenses in 32 states.

We have three U.S. manufacturing facilities and specialize in both roll-form and structural steel rack.

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