

Pallet Utilization

How-to guide: what the workbook does, how to use it and what every number means.

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Pallet Utilization

Check every case-and-pallet configuration for cube and weight utilization, find the layers you could still add, and estimate the freight a fuller pallet saves.

For: Packaging engineers, logistics and shipping planners, warehouse managers and plant managers who pay freight per pallet.

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Quick start

1. On Setup, type your company name and currency, pick your dimension and weight units, set your cube-utilization target and list your pallet types with their limits and freight cost.
2. On Pallet Configurations, enter one row per SKU and pattern: case size and weight, units per case, cases per layer, layers and pallets shipped per month.
3. Fix anything the Check column flags (too tall, over weight, a layer larger than the pallet).
4. Open the Dashboard: utilization against target, the layers you could add, and the estimated monthly freight saving.

What is in the workbook

Start Here	Read this first: what the workbook does and how to use it.
Setup	Company, currency, units, your cube-utilization target, and the pallet types with their limits and freight cost.
Pallet Configurations	One row per SKU and pallet pattern: utilization, layers you could add, freight per unit and the estimated saving.
Dashboard	Cube and weight utilization against your target, the layers you could add, and what fuller pallets would save.
Method	How every number is calculated, with assumptions, limits and sources.
Verify	Self-check: the workbook's formulas recomputed on fixed inputs against an independent reference.

What each number means

Quantity	How it is calculated	Units
Height limit, envelope, max payload	Max height - deck height; length x width x height limit / volume divisor; max gross - tare (per pallet type).	length, volume, weight
Units per pallet	Cases per layer x layers x units per case.	units

Quantity	How it is calculated	Units
Load cube	Cases per layer x layers x case length x width x height / volume divisor (1,728 in ³ per ft ³ ; 10 ⁶ cm ³ or 10 ⁹ mm ³ per m ³).	ft ³ or m ³
Cube utilization	Load cube / envelope.	%
Weight utilization	Cases per layer x layers x case weight / max payload.	%
Max layers, binding limit	MIN(INT(height limit / case height), INT(max payload / (cases per layer x case weight))); the limit giving the smaller number (Height on a tie).	layers
Layers to add	MAX(0, max layers - layers).	layers
Freight per unit, monthly freight	Freight per pallet / units per pallet; pallets per month x freight per pallet.	currency
Est. monthly saving	Monthly freight x layers to add / max layers: the same units on pallets with the maximum layers (an estimate).	currency/month
Cube status	On target at or above the target; Near target within 5% below it; Below target otherwise.	-
Dashboard utilization	Sum of (load cube x pallets per month) / sum of (envelope x pallets per month), rows with a known pallet type; weight the same way with payloads.	%

Assumptions, limitations, sources and the self-check (the Verify sheet, which recomputes the workbook's formulas on fixed test inputs) are in the workbook. The last page shows the Dashboard with the example data for Northfield Home Products, a fictional business.

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Engineering estimates for planning and improvement work. Verify the results against your own process, data and standards before you rely on them.

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Cube and weight utilization against your target, the layers you could add, and what fuller pallets would save.

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Showing 14 configurations for Northfield Home Products (example). Utilization is weighted by pallets shipped per month; dimensions in in, weights in lb.

CUBE UTILIZATION	WEIGHT UTILIZATION	CONFIGURATIONS BELOW TARGET	EST. FREIGHT SAVING (USD/MONTH)
72.0%	50.9%	10	6,527
Target 85.0%	Payload / max payload, by pallets shipped	Cube utilization under the target	If every pallet took the layers it has room for
Below target			

