

Takt Time Planner

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

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Takt Time Planner

Work out takt time for every month or scenario, and see where the bottleneck falls behind, the overtime it needs and the crew the pace takes.

For: Production and industrial engineers, line designers, planners and plant managers setting the pace of a line or cell.

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Quick start

1. On Setup, name the line and type the bottleneck cycle time, the total work content per unit and today's crew per shift; set the thresholds and, if you want the cost, the labour rate and overtime premium.
2. On Takt Plan, add one row per month, week or scenario: working days, shifts per day, shift length, breaks and planned stops, and demand.
3. Read takt time, the bottleneck load and status, the overtime needed and the operators needed on each row; fix anything the Check column flags.
4. Open the Dashboard for the tightest period, the overtime over the plan and the charts; change shifts or days on a row to test a fix.

What is in the workbook

Start Here	Read this first: what the workbook does and how to use it.
Setup	Bottleneck cycle, work content and crew, the capacity thresholds and the overtime cost rates.
Takt Plan	One row per month, week or scenario: the time available and the demand, and what the pace means for the line.
Dashboard	Where the plan is tight: takt against the bottleneck, overtime and crew, period by period.
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
Shifts	Working days x shifts per day.	shifts
Available time	(Shift length - breaks and planned stops) x shifts.	min
Takt time	Available time x 60 / demand.	s per unit
Required rate	Demand / (available time / 60).	units per hour

Quantity	How it is calculated	Units
Bottleneck load	Bottleneck cycle time (Setup) / takt time.	% of takt
Output at bottleneck pace	Available time x 60 / bottleneck cycle time: what the line makes in its shifts if it runs at the bottleneck's pace with no stops.	units
Surplus	Output at bottleneck pace - demand (negative = short).	units
Overtime needed	$\text{MAX}(0, \text{demand} \times \text{bottleneck cycle} / 60 - \text{available time}) / 60$.	h
Overtime cost (est.)	Overtime needed x operators per shift today x labour cost per hour x overtime premium (Setup). An estimate in your currency; no exchange rate is applied.	currency
Operators needed per shift	$\text{CEILING}(\text{total work content} / \text{takt time}, 1)$: the fewest operators who can share the work at that pace.	operators
Status	Under capacity below the Near-capacity threshold, Near capacity from it up to the Over-capacity threshold, Over capacity above it (bottleneck load).	-
Dashboard figures	Shortest takt = MIN of takt; peak load = MAX of load; overtime and cost = SUM over the plan; average takt = total available time x 60 / total demand.	-

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 Alder Fans, 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.

Takt Time Planner

Where the plan is tight: takt against the bottleneck, overtime and crew, period by period.

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2027 monthly plan | Alder Fans - final assembly line A (example) | Bottleneck: Motor run-in test, 46.0 s per unit | Today's crew: 6 per shift

SHORTEST TAKT (s): MAY	PEAK BOTTLENECK LOAD: MAY	OVERTIME NEEDED OVER THE PLAN (h)	PEAK OPERATORS NEEDED PER SHIFT
38.5	119.5%	38.4	8
The fastest pace the plan asks for	Limit 100.0% Over capacity	At the bottleneck's pace, all periods	Crew 6 Above target

