

Throughput Analysis

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

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Throughput Analysis

Log every line and shift, and see good units per hour against what demand needs, and how many units were lost to downtime, slow running and scrap.

For: Production managers, line leads, plant managers and continuous-improvement engineers.

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Quick start

1. On Setup, type your plant name and coverage target, then replace the example lines with yours: bottleneck cycle time, shifts per day and daily demand.
2. On Shift Log, add one row per line per shift: date, shift, line, scheduled minutes, downtime minutes, total units and good units.
3. Read the Check column: anything other than OK names the problem in words.
4. Open the Dashboard. Use the line and date filters at the top to look at one line or one week.

What is in the workbook

Start Here	Read this first: what the workbook does and how to use it.
Setup	Plant name, the demand coverage target, the lines with their bottleneck cycle and demand, and the shifts.
Shift Log	One row per line per shift: scheduled time, downtime, and the units made. Losses are counted in units.
Dashboard	Good throughput against demand, and where theoretical output went, for the line and dates you choose.
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
Scheduled time	Typed per row: shift length minus breaks. A shift that made nothing still gets a row.	min
Cycle and demand	Looked up from the line on Setup: the bottleneck cycle, and daily demand / shifts per day.	s/unit, units
Run time	Scheduled time - downtime.	min
Theoretical output	Scheduled time x 60 / bottleneck cycle.	units

Quantity	How it is calculated	Units
Good rate	Good units / (scheduled time / 60). Over several rows: sum of good x 60 / sum of scheduled.	units/h
Uptime and yield	Run time / scheduled time; good units / total units.	%
Share of theoretical	Good units / theoretical output: uptime x yield x running speed, where running speed = total units / (run time x 60 / cycle).	%
Downtime loss	Downtime x 60 / bottleneck cycle.	units
Speed loss	Run time x 60 / bottleneck cycle - total units: slow running and short stops. Below zero means the cycle on Setup is too slow, and Check says so.	units
Quality loss	Total units - good units.	units
Demand coverage and Status	Good units / demand; On target at or above the coverage target, Near target within 5% below it, Below target under that.	%
Cycle that meets demand	Run time x 60 x yield / demand, summed over the rows in view: the slowest bottleneck cycle that would have met demand at the same uptime and yield.	s/unit
Dashboard roll-ups	SUMIFS over the rows whose View date is filled in (inside the line and date filters); every ratio is formed from sums, never an average of percentages.	-
Share of theoretical, by line	Good units and each loss / theoretical output for the line: the four shares add up to 100% and feed the stacked bar chart.	%
Biggest loss	The largest of the three loss totals in view (ties go to downtime, then slow running).	-

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 Kettle Ridge Snacks, 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.

Throughput Analysis

Good throughput against demand, and where theoretical output went, for the line and dates you choose.

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Line

From

To

Showing 90 shift rows of Kettle Ridge Snacks - packing hall (example). Leave the filters blank to include everything; dates are inclusive.

GOOD THROUGHPUT (units/h)	DEMAND COVERAGE	SHARE OF THEORETICAL OUTPUT	BIGGEST LOSS
1,182	101.5%	78.8%	Downtime
Needed 1,164	Target 100.0%	Good units / output at the bottleneck cycle	Largest of the three losses, in units
On target	On target		

