

CNC Machining Quote

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

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CNC Machining Quote

Estimate CNC cycle time from cutting data, cost every operation, tool and charge, and price five quantity breaks on a printable quote.

For: Estimators, CNC programmers and owners of machine shops quoting milled and turned parts.

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Quick start

1. On Setup, enter your company details, currency, costing defaults, machine rates and material prices.
2. On Quote Builder, fill in the RFQ and size the blank, then list each operation with its handling time, stock removed and removal rate, toolpath and feed, and tool changes.
3. List the cutting tools with price, edges and parts per edge, then programming, fixtures and outside processing.
4. Type five quantity breaks and read cost, unit price, margin and lead time; the Dashboard shows the break you pick.
5. Print the Quote sheet or save it as PDF and send it.

What is in the workbook

Start Here	Read this first: what the workbook does and how to use it.
Setup	Your company, currency, terms, costing defaults, machine rates and material prices for every quote.
Quote Builder	Everything that sets the price: RFQ, blank, operations and cycle time, tools, NRE, outside processing, quantity breaks.
Dashboard	Price, cost, margin and lead time at the quantity you pick, and how the cost per part falls with quantity.
Quote	The customer-facing quotation. Print it or save it as PDF; it fills itself from the Quote Builder.
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
Blank volume and mass	Round: $\pi \times (\text{diameter} / 2)^2 \times \text{length}$; rectangular: width x thickness x length; in cm ³ (mm ³ x 0.001 or in ³ x 16.387064). Mass = volume x density / 1000.	cm ³ , kg

Quantity	How it is calculated	Units
Material cost per blank	Blank mass x price per kg (a price per lb / 0.45359237) x (1 + allowance).	currency
Operation cycle	Handling + stock removed / MRR + toolpath / feed + tool changes x chip-to-chip seconds / 60. Volume and length units cancel.	min/part
Operation costs	Setup cost = setup hours x machine rate; run cost = cycle / 60 x machine rate. Totals sum over the operations.	currency
Tool wear per part	Sum over tools of price / edges or lives / parts per edge.	currency/part
Parts to start	CEILING(quantity / first-pass yield): scrap is remade, so it uses material, machine time and tools.	parts
Variable lines	Material x (1 + markup), machine cost and tool wear, each x parts to start / quantity.	currency/part
Fixed lines	Setup cost / quantity; programming and NRE billed 'Amortise' / quantity.	currency/part
Outside processing	Per process the larger of lot charge and price x quantity, summed, / quantity, x (1 + markup).	currency/part
Shop overhead	(Setup + machine time per part) x overhead %.	currency/part
Unit price	CEILING(total cost / (1 - target margin), price step). Margin achieved = (price - cost) / price.	currency/part
Lead time	Material lead + CEILING(hours / (hours per day x uptime)) + outside lead times + queue and shipping; hours = setup hours + parts to start x cycle / 60.	working days

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 Kestrel Precision Machining, 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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Price, cost, margin and lead time at the quantity you pick, and how the cost per part falls with quantity.

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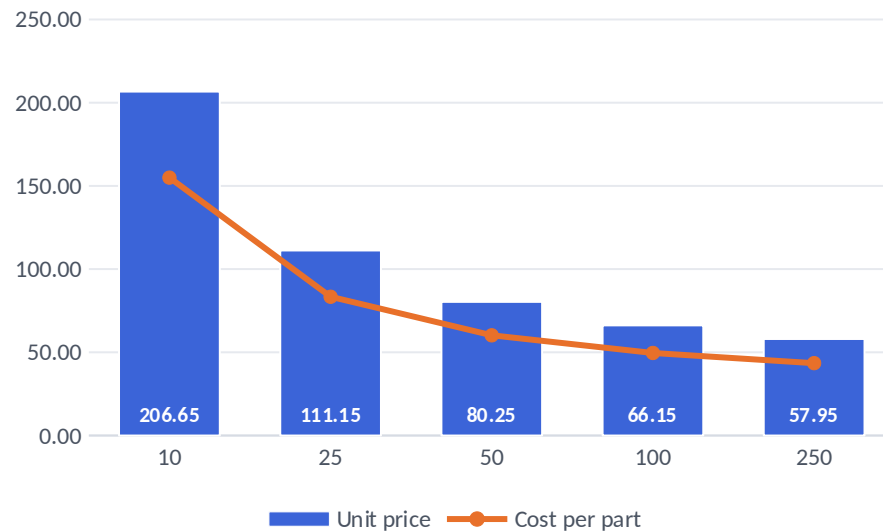
Quantity shown

100

Showing 100 parts of AFP-MB-204 (rev B) for Arden Fluid Power (example). Pick another quantity break in the yellow cell.

UNIT PRICE (USD/PART)	COST PER PART (USD)	MARGIN ACHIEVED	CYCLE TIME PER PART (MIN)
66.15	49.58	25.0%	20.6
Rounded up to your price step	All lines, before margin	Target 25.0%	Lead time 17 working days
		On target	

Unit price and cost by quantity



Where the cost per part goes

