Surface Speed and RPM Sheet

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



Surface Speed and RPM Sheet

Check the surface speed every tool runs at against the tool maker's range, with the RPM to run and whether the machine can reach it.

For: CNC programmers, machinists, manufacturing engineers and tooling buyers setting speeds for milling, drilling and turning.

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Quick start

1. On Setup, type your shop and list your machines with their maximum spindle speed.
2. On Tools, give each tool a row: description, machine, work material, diameter, programmed RPM and the catalog surface speed range.
3. Fix anything the Check column names.
4. Open the Dashboard: each tool's surface speed against its range, and the tools the machine cannot spin fast enough.

What is in the workbook

Start Here	Read this first: what the workbook does and how to use it.
Setup	Shop and the machines with their maximum spindle speed.
Tools	One row per tool or turned diameter: diameter, programmed RPM and catalog range in; surface speed, RPM limits and a suggested RPM out.
Dashboard	Surface speed of every tool against the tool maker's range, and the tools a machine cannot spin fast enough.
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
SFM and m/min	Programmed RPM x pi x diameter / 12; x 0.3048.	ft/min, m/min
RPM at catalog min and max	Catalog SFM x 12 / (pi x diameter).	RPM
Share of max	SFM / catalog max SFM.	%
Status	Within limits when SFM is between the catalog min and max; otherwise Out of limits.	-

Quantity	How it is calculated	Units
Suggested RPM	RPM at the middle of the range, capped at the machine's maximum RPM.	RPM
Catalog min reachable	Yes when RPM at catalog min is no more than the machine's maximum.	-

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 Brennan Precision, 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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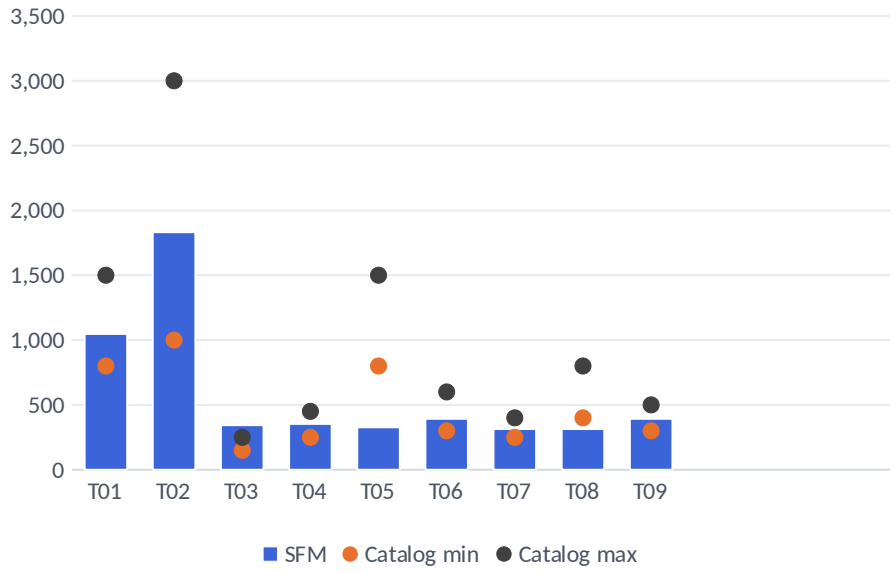
Surface speed of every tool against the tool maker's range, and the tools a machine cannot spin fast enough.

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Brennan Precision (example): 9 tools on 3 machines. Surface speed in SFM (ft/min).

TOOLS	INSIDE THE CATALOG RANGE	OUTSIDE THE CATALOG RANGE	MACHINE CANNOT REACH THE RANGE
9	6	3	1
Rows on Tools	Surface speed between min and max	Too slow or too fast	RPM at catalog min above machine max

Surface speed against catalog range (SFM)



Share of catalog maximum

