

Grinding Cutting Data Calculation

Sample document - numeric values are only included in the purchased Pro export.

Project: _____ Part/Position: _____ Prepared by: _____

Overall assessment: PASS

Inputs

Process ? ? ?
Wheel diameter d_s ? ? ? mm
Wheel speed n_s (given) ? ? ? min⁻¹
Workpiece speed v_w ? ? ? m/min
Depth of cut a_e ? ? ? mm
Workpiece diameter d_w ? ? ? mm

Cutting data

Cutting speed v_c ? ? ? m/s
Wheel speed n_s ? ? ? min⁻¹
Speed ratio q ? ? ?

Specific material removal rate and contact length

Specific material removal rate $Q'w$? ? ? mm³/(mm·s)
Equivalent chip thickness h_{eq} ? ? ? μm
Equivalent diameter d_{eq} ? ? ? mm
Contact length l_k ? ? ? mm
 $Q'w$ regime (guideline) ? ? ?

Evaluation criteria

Criterion	Value	Limit	Status
Cutting speed v_c (conventional 25...45 or HSG 60...140 m/s)	?	?	● PASS
Speed ratio q (guideline 40...150)	?	?	● PASS
Equivalent chip thickness h_{eq} (grinding burn/roughness risk guideline $\leq 10 \mu m$)	?	?	● PASS

Notes and calculation basis

Grinding cutting data for external cylindrical grinding or surface (peripheral) grinding. Calculation path: cutting speed $v_c = \pi \cdot d_s \cdot n_s / 60000$ (either from the wheel speed n_s or given directly, with the other quantity back-calculated), speed ratio $q = v_c / v_w$, specific material removal rate $Q'w = a_e \cdot v_w$ (unit chain m/min -> mm/s) as a productivity and thermal load measure, equivalent chip thickness $h_{eq} = Q'w / v_c$ as an indicator for roughness and grinding burn risk, and a geometric approximation of the contact length $l_k = \sqrt{a_e \cdot d}$ - for external cylindrical grinding with an optionally given workpiece diameter via the equivalent diameter $d_{eq} = d_s \cdot d_w / (d_s + d_w)$. Simplifications: wheel specification (grain, bond, grade), dressing condition, coolant effect and material-specific grindability are not part of this calculation - the assessment is a rough guideline, not a rigorous proof.

Note: The results are design and orientation aids. They do not replace independent verification, calculation and approval by a qualified person. The terms of use at maschinenbaurechner.de apply.