Laser, Plasma or Waterjet Cutting Time

Cutting time for a profile-cut part from total cut length, cutting speed, number of pierces and pierce time, with rapid moves, and the cost at a machine rate.

Method: t = L/v + n_p t_p + L_r/v_r

Input parameters

Unit system: SI

Parameter	Value	Unit
Total cut length	6.0000	m
Cutting speed From the machine's cutting chart for the material and thickness.	3.0000	m/min
Number of pierces	12.000	
Time per pierce	1.5000	s
Rapid travel length	4.0000	m
Rapid speed	60.000	m/min
Machine rate per hour	3,000.0	

Calculated results

Parameter	Value	Unit
Total time	2.3667	min
Cost	118.33	

Notes for this case

- Chart speeds are for straight cuts: corners, small holes and short contours slow the head, so the real time is longer. Allow for it, or use the machine's nesting software.

Formula and method

$$t = \frac{L}{v} + n_p t_p + \frac{L_r}{v_r}, \quad C = \frac{t\,c}{3600\ \mathrm{s/h}}$$

Variables

L	Total cut length	m
v	Cutting speed	m/s
n_p	Number of pierces	-
t_p	Time per pierce	s
L_r	Rapid travel length	m
v_r	Rapid speed	m/s
c	Machine rate per hour	-
t	Total time	s
C	Cost	-

Method and standards

Time sum.

Assumptions and limits

- Constant speeds: no acceleration or slow-down on corners and small contours (a note reminds of this).

References

- t = L/v + n_p t_p + L_r/v_r

Report details

Report reference	FCC-AA4M-B4BG (the same inputs always give the same reference)
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Release checks	2 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/mechanical/manufacturing/cnc-cutting-time

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.