Takt Time and Line Balance

Takt time from available time and customer demand, the minimum number of workstations for a total work content, and the line balance efficiency.

Method: Takt = available time/demand; n_min = ⌈T_w/T_t⌉; balance efficiency T_w/(n T_t) (lean manufacturing)

Input parameters

Unit system: SI

Parameter	Value	Unit
Available working time per day	450.00	min
Demand per day	450.00	
Total work content per unit	4.2000	min
Workstations actually used	5.0000	

Calculated results

Parameter	Value	Unit
Takt time	60.000	s
Minimum workstations (rounded up)	5.0000	
Balance efficiency T_w/(n T_t)	84.000	%

Formula and method

$$T_t = \frac{t_a}{D}, \quad n_{min} = \left\lceil \frac{T_w}{T_t} \right\rceil, \quad \eta_b = \frac{T_w}{n T_t}$$

Variables

t_a	Available working time per day	s
D	Demand per day	-
T_w	Total work content per unit	s
n	Workstations actually used	-
T_t	Takt time	s
n_{min}	Minimum workstations (rounded up)	-
η_b	Balance efficiency T_w/(n T_t)	-

Method and standards

Lean definitions.

Assumptions and limits

- With fewer stations than n_min the line cannot meet takt; the balance efficiency then exceeds 100 % and the page warns.
- Steady demand.

References

- Takt = available time/demand; n_min = ⌈T_w/T_t⌉; balance efficiency T_w/(n T_t) (lean manufacturing)

Report details

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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/takt-time

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.