Bucket Elevator Capacity

Throughput of a bucket elevator from bucket volume, fill factor, bucket spacing, belt or chain speed and the material's bulk density.

Method: Volumetric throughput V̇ = V_b φ v/s

Input parameters

Unit system: SI

Parameter	Value	Unit
Bucket volume (water level)	4.2000	L
Fill factor	75.000	%
Bucket spacing (pitch)	0.30000	m
Belt or chain speed	1.4000	m/s
Bulk density	800.00	kg/m³

Calculated results

Parameter	Value	Unit
Volume throughput	52.920	m³/h
Mass throughput	42.336	t/h

Notes for this case

- Speed must suit the discharge type (centrifugal or continuous); fill factor depends on the feed arrangement.

Formula and method

$$\dot{V} = \frac{V_b \phi v}{s}, \quad \dot{m} = \rho_b \dot{V}$$

Variables

V_b	Bucket volume (water level)	m³
ϕ	Fill factor	-
s	Bucket spacing (pitch)	m
v	Belt or chain speed	m/s
ρ_b	Bulk density	kg/m³
$\dot{V}$	Volume throughput	m³/s
$\dot{m}$	Mass throughput	kg/s

Method and standards

Volumetric throughput from the definition: bucket volume times fill factor, times the number of buckets passing per second (v/s). The fill factor and speed are your inputs or the maker's figures; no published table is reproduced.

Assumptions and limits

- Steady feed. The speed is not checked against the discharge type (centrifugal or continuous) and the pitch is not checked against the bucket size; take both from the maker.

References

- Volumetric throughput V̇ = V_b φ v/s

Report details

Report reference	FCC-Y9BJ-1AE6 (the same inputs always give the same reference)
Generated	17 November 2026, 19:36 UTC
Calculator	Bucket Elevator Capacity
Method last reviewed	13 November 2026
Software release	FireCAD Calc, release of 17 November 2026
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/boilers-power-plant/fuel-ash-handling/bucket-elevator-capacity

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.