Cane Carrier Speed

Speed a cane carrier must run to deliver a crushing rate from the carrier width, cane bed height and loose cane bulk density.

Method: Continuity v = ṁ/(ρ W H); bulk density by measurement; Hugot; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Crushing rate	250.00	t/h
Carrier width	2.1000	m
Cane bed height	1.0000	m
Cane bulk density on the carrier	180.00	kg/m³

Calculated results

Parameter	Value	Unit
Carrier speed	11.023	m/min
Cane load per metre of carrier	378.00	kg/m

Notes for this case

- Hugot: carrier speed about half the mill peripheral speed (0.3–0.5 of it); bulk density 150 kg/m³ tangled, 175 parallel, 300 after knives.

Formula and method

$$v = \frac{C}{\rho_b W H}, \quad q_L = \rho_b W H = \frac{C}{v}$$

Variables

C	Crushing rate	kg/s
W	Carrier width	m
H	Cane bed height	m
ρ_b	Cane bulk density on the carrier	kg/m³
v	Carrier speed	m/s
q_L	Cane load per metre of carrier	kg/m

Method and standards

Continuity.

Assumptions and limits

- Uniform bed.

References

- Continuity v = ṁ/(ρ W H); bulk density by measurement
- Hugot
- Handbook of Cane Sugar Engineering
- 3rd ed. (1986)
- ch. 2
- eqns 2.3–2.8 and bulk densities
- pp. 22–26

Report details

Report reference	FCC-4YE7-NQRB (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/sugar-ethanol/cane-preparation/cane-carrier-speed

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.