Mud Filter Area from Cake and Filtration Rate

Filter cake made per hour from the crush and cake % cane, and the rotary vacuum or belt filter area from the filtration rate.

Method: Mass balance; cake % cane and filtration rate from Hugot; Handbook of Cane Sugar Engineering; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Crushing rate	250.00	t/h
Filter cake % cane Hugot ch. 31: 3–4 kg cake per 100 kg cane at 75–80 % moisture.	3.5000	%
Filtration rate (cake per filter area) Hugot ch. 31: 60–75 kg/(m²·h); 0.3–0.8 m² of filter per t cane/h in practice.	60.000	kg/(m²·h)

Calculated results

Parameter	Value	Unit
Filter cake made	8.7500	t/h
Filter area	145.83	m²

Notes for this case

- 0.58 m² per t cane/h, within the 0.3–0.8 of practice.

Formula and method

$$\dot{m}_{FC} = C\,FC, \quad A = \frac{\dot{m}_{FC}}{r}$$

Variables

C	Crushing rate	kg/s
FC	Filter cake % cane	-
r	Filtration rate (cake per filter area)	kg/(m²·s)
$\dot{m}_{FC}$	Filter cake made	kg/s
A	Filter area	m²

Method and standards

Mass balance.

Assumptions and limits

- Wet cake basis.
- The area per t cane/h is compared with the 0.3–0.8 m² of practice quoted by Hugot.

References

- Mass balance; cake % cane and filtration rate from Hugot
- Handbook of Cane Sugar Engineering
- 3rd ed. (Elsevier, 1986)
- ch. 31
- Oliver filters
- pp. 473–483

Report details

Report reference	FCC-N1S9-KZE3 (the same inputs always give the same reference)
Generated	17 November 2026, 19:45 UTC
Calculator	Mud Filter Area from Cake and Filtration Rate
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/sugar-ethanol/clarification/rotary-vacuum-filter-area

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.