Filter Press Area and Frames

Filtering area of a plate-and-frame filter press from its frames (Hugot eqn 31.1), the crush it serves at an area per t cane/h, and the frames needed.

Method: Hugot; Handbook of Cane Sugar Engineering; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Crushing rate	100.00	t/h
Number of frames	42.000	
Frame inside height	0.91500	m
Frame inside width	0.91500	m
Area needed per t cane/h (m² per t/h) Hugot Table 31.1: first carbonatation 6–13, second 4–5, syrup 3–5 m² per t cane/h. The table gives no figure for defecation mud: use plant practice.	6.0000	m²

Calculated results

Parameter	Value	Unit
Filtering area	70.327	m²
Crush the press serves	11.721	t/h
Area needed	600.00	m²
Frames needed	359.00	

Notes for this case

- Each frame filters on both faces. Hugot's cycle: about 3 hours of filling, washing and emptying.

Formula and method

$$S = 2NHL_f, \quad A_S = \frac{S}{r}, \quad N_n = \left\lceil \frac{Ar}{2HL_f} \right\rceil$$

Variables

A	Crushing rate	kg/s
N	Number of frames	-
H	Frame inside height	m
L_f	Frame inside width	m
r	Area needed per t cane/h	m²
S	Filtering area	m²
A_S	Crush the press serves	kg/s
S_n	Area needed	m²
N_n	Frames needed	-

Method and standards

Hugot's area rule.

Assumptions and limits

- Area per t/h from practice; it is shown in m² per t cane/h. Hugot's table covers carbonatation and syrup filtration, not defecation mud.

References

- Hugot
- Handbook of Cane Sugar Engineering
- 3rd ed. (Elsevier, 1986)
- ch. 31
- eqn 31.1 and Table 31.1
- pp. 469–472

Report details

Report reference	FCC-SWHP-Y9TB (the same inputs always give the same reference)
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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/filter-press-area

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.