Clarifier Mud, Filtrate Return and Clear Juice

Mud from the clarifier, filtrate returned from the filters, clear juice and the extra load the filtrate puts on the clarifier, per tonne cane (Hugot ch. 29–31).

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

Input parameters

Unit system: SI

Parameter	Value	Unit
Crushing rate	100.00	t/h
Mixed juice per tonne cane	1.0000	kg/kg
Mud per tonne cane Hugot: 180–240 kg/t cane.	0.20000	kg/kg
Filter cake per tonne cane	0.035000	kg/kg
Wash water per unit cake Hugot: 100–150 % on cake.	125.00	%

Calculated results

Parameter	Value	Unit
Filtrate	20.875	t/h
Clarifier feed (mixed juice + filtrate)	120.88	t/h
Extra load from filtrate	20.875	%
Clear juice	100.88	t/h

Notes for this case

- Filtrate adds 21 % to the clarifier load, outside the 12–20 % Hugot gives for simple clarification: check the mud, cake and wash water.

Formula and method

$$F = A(m_m - m_c + w_w m_c), \quad \dot{m}_{in} = A\,MJ + F, \quad CJ = \dot{m}_{in} - A\,m_m$$

Variables

A	Crushing rate	kg/s
MJ	Mixed juice per tonne cane	kg/kg
m_m	Mud per tonne cane	kg/kg
m_c	Filter cake per tonne cane	kg/kg
w_w	Wash water per unit cake	-
F	Filtrate	kg/s
$\dot{m}_{in}$	Clarifier feed (mixed juice + filtrate)	kg/s
F/MJ	Extra load from filtrate	-
CJ	Clear juice	kg/s

Method and standards

Steady mass balance.

Assumptions and limits

- Steady state; no evaporation.

References

- Hugot
- Handbook of Cane Sugar Engineering
- 3rd ed. (Elsevier, 1986)

- ch. 29–31
- mud and filtrate quantities
- pp. 471–480
- Mass balance of clarifier and filters

Report details

Report reference	FCC-J18Y-VTBV (the same inputs always give the same reference)
Generated	17 November 2026, 19:35 UTC
Calculator	Clarifier Mud, Filtrate Return and Clear Juice
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/clarifier-mud-filtrate

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.