Juice Clarifier Volume and Area

Clarifier working volume, settling area and diameter from the juice flow, the retention time and the working depth.

Method: V = Q t; A = V/H (definitions); retention and depth by design practice (Rein, Cane Sugar Engineering)

Input parameters

Unit system: SI

Parameter	Value	Unit
Juice flow	250.00	m^3/h
Retention time Rapid (SRI) clarifiers about 20 min. Hugot ch. 29 sizes tray clarifiers by volume, 2.4–3.8 m^3 per t cane/h, which is not a time: divide it by the juice volume per tonne cane to get hours.	2.5000	h
Working depth	5.0000	m

Calculated results

Parameter	Value	Unit
Working volume	625.00	m^3
Plan area V/H	125.00	m^2
Diameter of one round clarifier	12.616	m

Notes for this case

- Short-retention clarifiers trade volume for lower sucrose inversion and colour; choose time and depth by design.

Formula and method

$$V = \dot{V} t, \quad A = \frac{V}{H}, \quad D = \sqrt{4A/\pi}$$

Variables

$\dot{V}$	Juice flow	m^3/s
t	Retention time	s
H	Working depth	m
V	Working volume	m^3
A	Plan area V/H (single compartment)	m^2
D	Diameter of one round clarifier	m

Method and standards

Definitions.

Assumptions and limits

- Plug flow.
- The area here is the plan area of one compartment, V/H, and so depends on the depth chosen. Settling capacity depends on area, not depth (Hugot); check the area against the mud settling velocity with the clarifier settling area calculator. For a multi-tray clarifier the settling area is the sum of the trays.

References

• V = Q t
• A = V/H (definitions); retention and depth by design practice (Rein, Cane Sugar Engineering)

Report details

Report reference	FCC-DX3R-J48F (the same inputs always give the same reference)
Generated	17 November 2026, 19:44 UTC
Calculator	Juice Clarifier Volume and Area
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-sizing

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.