Juice and Bagasse Weights through the Tandem (Hugot)

Bagasse and juice from each mill of a 4- to 6-mill tandem with compound imbibition, per unit cane, from fibre, imbibition and bagasse fibre (Hugot p. 299).

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

Input parameters

Unit system: SI

Parameter	Value	Unit
Fibre per unit cane	15.000	%
Imbibition water per unit cane	36.000	%
Number of mills	5.0000	
Fibre in bagasse from mill 1	33.000	%
Fibre in bagasse from mill 2	40.000	%
Fibre in bagasse from mill 3	44.000	%
Fibre in bagasse from mill 4	47.000	%
Fibre in bagasse from mill 5	50.000	%
Fibre in bagasse from mill 6	52.000	%

Calculated results

Parameter	Value	Unit
Bagasse from mill 1 per unit cane	45.455	%
Bagasse from mill 2 per unit cane	37.500	%
Bagasse from mill 3 per unit cane	34.091	%
Bagasse from mill 4 per unit cane	31.915	%
Bagasse from mill 5 per unit cane	30.000	%
Bagasse from mill 6 per unit cane	0	%
Juice from mill 1 per unit cane	54.545	%
Juice from mill 2 per unit cane	51.455	%
Juice from mill 3 per unit cane	43.500	%
Juice from mill 4 per unit cane	40.091	%
Juice from mill 5 per unit cane	37.915	%
Juice from mill 6 per unit cane	0	%
Mixed juice per unit cane	106.00	%

Notes for this case

- Juice from intermediate mills returns as imbibition; only the first two mills' juice goes to process. Outputs for absent mills are zero.

Formula and method

$$b_i = \frac{f}{F_i}, \quad Q = 1 + w - b_N, \quad j_1 = 1 - b_1, \quad j_i = b_{i-1} + w - b_N \ (i \geq 2)$$

Variables

f	Fibre per unit cane	-

w	Imbibition water per unit cane	-
N	Number of mills	-
F_1	Fibre in bagasse from mill 1	-
F_2	Fibre in bagasse from mill 2	-
F_3	Fibre in bagasse from mill 3	-
F_4	Fibre in bagasse from mill 4	-
F_5	Fibre in bagasse from mill 5	-
F_6	Fibre in bagasse from mill 6	-
b_1	Bagasse from mill 1 per unit cane	-
b_2	Bagasse from mill 2 per unit cane	-
b_3	Bagasse from mill 3 per unit cane	-
b_4	Bagasse from mill 4 per unit cane	-
b_5	Bagasse from mill 5 per unit cane	-
b_6	Bagasse from mill 6 per unit cane	-
j_1	Juice from mill 1 per unit cane	-
j_2	Juice from mill 2 per unit cane	-
j_3	Juice from mill 3 per unit cane	-
j_4	Juice from mill 4 per unit cane	-
j_5	Juice from mill 5 per unit cane	-
j_6	Juice from mill 6 per unit cane	-
Q	Mixed juice per unit cane	-

Method and standards

Hugot's mass balance with chokeless return of intermediate juices.

Assumptions and limits

- Compound imbibition with all fine bagasse returned.
- Q = 1 + w − b_N is the mixed juice, taken as the juice of mills 1 and 2 only; intermediate juices return as imbibition.
- Fibre in bagasse must not fall along the tandem, and no juice flow may be negative.

References

• Hugot
• Handbook of Cane Sugar Engineering
• 3rd ed. (Elsevier, 1986)
• ch. 19
• relative weights of bagasse and juice
• pp. 297–299 (example f 0.15, w 0.36)

Report details

Report reference	FCC-27V0-W6A1 (the same inputs always give the same reference)
Generated	17 November 2026, 19:50 UTC
Calculator	Juice and Bagasse Weights through the Tandem (Hugot)
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/milling/tandem-juice-bagasse-weights

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.