Brix of Absolute Juice and Hawaii and Java Ratios

Brix of absolute juice from the soluble-matter balance (Hugot eqn 21.14), the Hawaii ratio to first expressed juice, and Arceneaux, Innes and Java estimates.

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

Input parameters

Unit system: SI

Parameter	Value	Unit
Mixed juice per unit cane	102.46	%
Brix of mixed juice	16.960	%
Soluble matter % bagasse	2.8200	%
Fibre per unit cane	13.460	%
Fibre per unit bagasse	48.000	%
Brix of first expressed juice	21.700	%

Calculated results

Parameter	Value	Unit
Brix of absolute juice	20.994	%
Hawaii ratio B_A/B₁	0.96745	
Arceneaux estimate 1 − 0.002 f	0.97308	
Innes estimate 1.003 − 0.004 f	0.94916	
Java ratio estimate (Innes) 98.5 − 1.34 f	80.464	%

Formula and method

$$B_A = \frac{Q B_m + B_b f/f'}{1 - f}, \quad k = \frac{B_A}{B_1}, \quad k_{Arc} = 1 - 0.002 f, \quad k_{Innes} = 1.003 - 0.004 f, \quad J.R. = 98.5 - 1.34 f \,(f \text{ in } \%)$$

Variables

Q	Mixed juice per unit cane	-
B_m	Brix of mixed juice	-
B_b	Soluble matter % bagasse	-
f	Fibre per unit cane	-
f'	Fibre per unit bagasse	-
B_1	Brix of first expressed juice	-
B_A	Brix of absolute juice	-
k	Hawaii ratio B_A/B₁	-
k_{Arc}	Arceneaux estimate 1 − 0.002 f	-
k_{Innes}	Innes estimate 1.003 − 0.004 f	-
$J.R.$	Java ratio estimate (Innes) 98.5 − 1.34 f	-

Method and standards

Hugot's soluble-matter balance and the cited empirical ratios.

Assumptions and limits

- Steady crush; no losses.
- The Arceneaux, Innes and Java-ratio lines are empirical fits to the canes they were measured on (normal commercial fibre, roughly 10–18 %); outside that range they are indicative only, and the page says so.
- Hugot's worked example (Q 1.0246, B_m 16.96, B_b 2.82, f 13.46 %, f′ 48 %) gives 20.99 brix of absolute juice.

References

• Hugot
• Handbook of Cane Sugar Engineering
• 3rd ed. (Elsevier, 1986)
• ch. 21
• eqns 21.13–21.23
• pp. 335–340

Report details

Report reference	FCC-6M6K-T8ZE (the same inputs always give the same reference)
Generated	17 November 2026, 19:35 UTC
Calculator	Brix of Absolute Juice and Hawaii and Java Ratios
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/absolute-juice-brix

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.