Juice Brix along Compound Imbibition (Hugot)

Expected brix of the juice from each wet-crushing mill with compound imbibition from the normal juice brix, imbibition on fibre and number of wet mills (eqn 19.19).

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

Input parameters

Unit system: SI

Parameter	Value	Unit
Brix of normal (dry-crushing) juice	18.000	%
Fibre per unit cane	15.000	%
Imbibition water per unit cane	30.000	%
Number of wet-crushing mills	4.0000	

Calculated results

Parameter	Value	Unit
Imbibition per unit fibre	2.0000	
Brix of juice from wet mill 1	8.7097	%
Brix of juice from wet mill 2	4.0645	%
Brix of juice from wet mill 3	1.7419	%
Brix of juice from wet mill 4	0.58065	%

Notes for this case

- Measured brixes far below these values show a mill not extracting its share; compare them with the brix curve of the tandem.

Formula and method

$$\lambda = \frac{w}{f}, \quad B_p = B_0 \, \frac{\lambda^{n-p+1} - 1}{\lambda^{n+1} - 1}$$

Variables

B_0	Brix of normal (dry-crushing) juice	-
f	Fibre per unit cane	-
w	Imbibition water per unit cane	-
n	Number of wet-crushing mills	-
λ	Imbibition per unit fibre	-
B_1	Brix of juice from wet mill 1	-
B_2	Brix of juice from wet mill 2	-
B_3	Brix of juice from wet mill 3	-
B_4	Brix of juice from wet mill 4	-
B_5	Brix of juice from wet mill 5	-

Method and standards

Hugot's theory of compound imbibition with complete mixing.

Assumptions and limits

- Complete mixing; equal purities.
- Outputs are shown only for the wet mills that exist.
- This is Hugot's simple form with the imbibition ratio taken as w/f. The imbibition extraction theory calculator corrects the ratio for the fibre in bagasse and an imbibition efficiency, so the two can show different brix and extraction trends; use that one for extraction.

References

- Hugot
- Handbook of Cane Sugar Engineering
- 3rd ed. (Elsevier, 1986)
- ch. 19
- eqns 19.17–19.19
- pp. 294–297; brix graphs
- ch. 21
- p. 331

Report details

Report reference	FCC-8EEK-36S8 (the same inputs always give the same reference)
Generated	17 November 2026, 19:46 UTC
Calculator	Juice Brix along Compound Imbibition (Hugot)
Method last reviewed	13 November 2026
Software release	FireCAD Calc, release of 17 November 2026
Release checks	3 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/compound-imbibition-juice-brix

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.