Factory Efficiency Coefficient k (Hugot)

Hugot's coefficient k relating sugar made to fibre, pol and brix of juice (eqns 21.31–21.34), and the recoverable sugar from a cane analysis with a known k.

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

Input parameters

Unit system: SI

Parameter	Value	Unit
Fibre per unit cane	13.400	%
Pol (sucrose) % juice Primary juice for k_U and k_P; calculated absolute juice for k_A.	14.540	%
Brix % juice	17.360	%
Sugar made % cane	10.820	%
Known coefficient for the recoverable sugar Hugot normal values: k_P 1.32–1.40, k_U 1.34–1.42, k_C 1.36–1.44, k_A 1.40–1.53.	1.3900	

Calculated results

Parameter	Value	Unit
Cane quality term	7.2687	%
Efficiency coefficient from the yield	1.4886	
Recoverable sugar % cane with the known k	10.103	%

Notes for this case

- k must be on the same juice basis as S and B (primary, crusher, mixed or absolute juice): k_A on absolute juice runs about 0.1 above k_U on primary juice.

Formula and method

$$X = k(1 - 1.65f)(S - 0.3B), \quad k = \frac{\rho}{(1 - 1.65f)(S - 0.3B)}$$

Variables

f	Fibre per unit cane	-
S	Pol (sucrose) % juice	-
B	Brix % juice	-
ρ	Sugar made % cane	-
k	Known coefficient for the recoverable sugar	-
$(1 - 1.65f)(S - 0.3B)$	Cane quality term	-
X	Recoverable sugar % cane with the known k	-

Method and standards

Hugot's coefficient derived from the losses in bagasse and molasses.

Assumptions and limits

- Standard losses folded into k.
- S and B and the known k must refer to the same juice (primary, crusher, mixed or absolute); the forms of k differ by a few points.
- Hugot's examples: f 0.134, B_A 17.36, S_A 14.54 and 10.82 % yield give k_A = 1.4886; k 1.39 with f 0.136, B 21.40, S 18.83 gives 13.38 % recoverable.

References

- Hugot
- Handbook of Cane Sugar Engineering

- 3rd ed. (Elsevier, 1986)
- ch. 21
- eqns 21.25–21.34 and Table 21.3
- pp. 342–350

Report details

Report reference	FCC-XQWN-EJWM (the same inputs always give the same reference)
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Method last reviewed	13 November 2026
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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/cane-efficiency-coefficient-k

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.