Sugar Safety Factor, Dilution Indicator and Titre

Keeping quality of raw sugar by safety factor and dilution indicator (Hugot eqns 36.1–36.2), and its titre (37.6), net titre (37.7) and the EEC titre 2P − 100.

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

Input parameters

Unit system: SI

Parameter	Value	Unit
Polarisation	98.500	%
Moisture	0.40000	%
Reducing sugars	0.40000	%
Ash (on the basis of the titre definition used)	0.30000	%

Calculated results

Parameter	Value	Unit
Safety factor	0.26667	
Dilution indicator	36.364	
Titre pol − (2r + 4c)	96.500	%
Net titre pol − (r + 5c)	96.600	%
EEC titre 2P − 100	97.000	%

Notes for this case

- Hugot: safety factor below 0.25–0.3 keeps; dilution indicator above 50 (safety factor 0.33) is risky. He prefers the dilution indicator.

Formula and method

$$f = \frac{H}{100 - Pol}, \quad D.I. = \frac{100H}{100 - (Pol + H)}, \quad T = Pol - (2r + 4c), \quad T_n = Pol - (r + 5c)$$

Variables

Pol	Polarisation	-
H	Moisture	-
r	Reducing sugars	-
c	Ash (on the basis of the titre definition used)	-
f	Safety factor	-
$D.I.$	Dilution indicator	-
T	Titre pol − (2r + 4c)	-
T_n	Net titre pol − (r + 5c)	-
T_E	EEC titre 2P − 100	-

Method and standards

Definitions as given by Hugot.

Assumptions and limits

- Percentages on sugar.
- Ash on the basis the titre definition calls for (sulphated or conductivity ash); the page does not convert between them.
- The safety factor and dilution indicator are compared with Hugot's thresholds in a note.

References

- Hugot

- Handbook of Cane Sugar Engineering
- 3rd ed. (Elsevier, 1986)
- ch. 36
- eqns 36.1–36.2
- p. 817; ch. 37
- eqns 37.6–37.7
- pp. 834–835

Report details

Report reference	FCC-FNDT-20X1 (the same inputs always give the same reference)
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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/centrifugals-sugar-house/sugar-safety-factor-titre

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.