ISSCT Mill Balance: Fibre, Absolute Juice, Extraction

Weekly or season mill balance by the ISSCT standard method in Hugot (items 1–34): fibre, imbibition % fibre, absolute juice, dilution, sucrose % cane, extraction.

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

Input parameters

Unit system: SI

Parameter	Value	Unit
Cane crushed	35,000	t
Mixed juice (gross)	35,700	t
Imbibition water	10,200	t
Suspended matter % mixed juice	0.50000	%
Sucrose (pol) % bagasse	1.9000	%
Purity of residual juice in bagasse	70.000	%
Moisture % bagasse	50.000	%
Sucrose % mixed juice	12.800	%
Brix % mixed juice	15.200	%

Calculated results

Parameter	Value	Unit
Mixed juice, corrected	35,522	t
Bagasse made	9,500.0	t
Fibre % bagasse	47.286	%
Fibre % cane	13.345	%
Imbibition % fibre	218.39	%
Sucrose % cane	13.506	%
Purity of absolute juice	83.563	%
Absolute juice extracted % cane	82.705	%
Dilution % cane	19.295	%
Extraction	96.182	%
Reduced extraction, Mittal with Rein's correction	96.253	%
Milling loss (sucrose per fibre)	4.0181	%
Extraction coefficient	28.613	%

Notes for this case

- Bagasse is cane + water − mixed juice (no loss allowance). Hugot recommends Rein's sugar correction in the reduced extraction, which the ISSCT list does not yet include.

Formula and method

$$Q' = Q(1 - f'), \quad P = C + W - Q, \quad g = 1 - h - \frac{u}{p}, \quad F = Pg + Qf'$$

$$R = Q't + Pu, \quad A = C - F, \quad P_A = \frac{R}{Q'B + Pu/p}, \quad e = \frac{Q't}{R}$$

$$f = \frac{F}{C}, \quad \frac{W}{F}, \quad r = \frac{R}{C}, \quad B_A = \frac{Q'B + Pu/p}{A}, \quad k = \frac{Q'B}{B_A C}, \quad d = \frac{Q}{C} - k$$

$$e_{12.5} = 1 - \frac{0.125(1-e)}{f}\left(\frac{r}{0.125}\right)^{0.6}, \quad \frac{u}{g}, \quad \frac{1-e}{f}$$

Variables

C	Cane crushed	kg
Q	Mixed juice (gross)	kg
W	Imbibition water	kg
f'	Suspended matter % mixed juice	-
u	Sucrose (pol) % bagasse	-
p	Purity of residual juice in bagasse	-
h	Moisture % bagasse	-
t	Sucrose % mixed juice	-
B	Brix % mixed juice	-
Q'	Mixed juice, corrected	kg
P	Bagasse made	kg
g	Fibre % bagasse	-
f	Fibre % cane	-
W/F	Imbibition % fibre	-
r	Sucrose % cane	-
P_A	Purity of absolute juice	-
B_A	Brix of absolute juice	-
A	Absolute juice (cane less fibre)	kg
R	Sucrose in cane (mixed juice plus bagasse)	kg
F	Fibre	kg
k	Absolute juice extracted % cane	-
d	Dilution % cane	-
e	Extraction	-
$e_{12.5}$	Reduced extraction, Mittal with Rein's correction	-
u/g	Milling loss (sucrose per fibre)	-
$(100-e)/f$	Extraction coefficient	-

Method and standards

The ISSCT standard as printed by Hugot (fractions in place of percentages), Handbook of Cane Sugar Engineering, 3rd ed., pp. 848–850. The reduced extraction is ISSCT item 32 (p. 850), Hugot eqn 20.10 (p. 318): 1 − 0.125(1 − e)/f^0.6, Mittal's form with Rein's sucrose correction; unlike Deerr's form it has no (1 − f) term.

Assumptions and limits

- Weights over the period; no stock changes.
- Dilution uses the gross mixed juice Q, as the ISSCT list does, while the absolute juice uses the corrected Q'. Pol % bagasse stands in for sucrose % bagasse.
- The reduced extraction is shown in the form coded here (Mittal's with a sugar correction); see the method note.
- Fibre at or above the cane weight is rejected, and extraction above 100 % is flagged.

References

• Hugot
• Handbook of Cane Sugar Engineering
• 3rd ed. (Elsevier, 1986)
• ch. 39
• ISSCT standard control system

- items 1–34
- pp. 848–850

Report details

Report reference	FCC-V5PZ-VP3D (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

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Reopens the calculator with the inputs of this report.