Cane Yard Overnight Stock (Hugot)

Cane the yard must hold so the mill keeps crushing through the night when cane arrives only in daylight, with a reserve of a few hours (Hugot eqns 1.1–1.3).

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

Input parameters

Unit system: SI

Parameter	Value	Unit
Crushing rate	250.00	t/h
Crushing hours per day	24.000	h
Hours per day in which cane is delivered	12.000	h
Reserve kept in the yard (hours of crushing)	3.0000	h

Calculated results

Parameter	Value	Unit
Cane to hold in the yard at the end of deliveries	3,750.0	t
Stock in hours of crushing	15.000	h
Delivery rate needed while cane arrives	500.00	t/h

Notes for this case

- The yard holds 15.0 hours of crushing at the end of deliveries; cut cane loses sucrose while it waits, so keep it no larger than the transport needs.

Formula and method

$$P = A\,(t_c - t_d) + A\,t_r \quad (\text{Hugot}: \; P = 12A + 3A = 15A)$$

$$\dot{m}_d = \frac{A\,t_c}{t_d}$$

Variables

A	Crushing rate	kg/s
t_c	Crushing hours per day	s
t_d	Hours per day in which cane is delivered	s
t_r	Reserve kept in the yard (hours of crushing)	s
P	Cane to hold in the yard at the end of deliveries	kg
P/A	Stock in hours of crushing	s
$\dot{m}_d$	Delivery rate needed while cane arrives	kg/s

Method and standards

Hugot's cane-yard balance: the cane delivered during transport hours must carry the crush through the hours without deliveries plus a reserve.

Assumptions and limits

- Steady crush; delivery evenly spread over the delivery hours, and all delivery hours fall within crushing hours. If the mill stops while cane still arrives, the stock needed differs.
- Hugot's case: 12 hours of daylight transport, 24 hours of crushing and 3 hours of reserve give P = 15 A.

References

- Hugot
- Handbook of Cane Sugar Engineering
- 3rd ed. (Elsevier, 1986)

- ch. 1
- eqns 1.1–1.3
- p. 1

Report details

Report reference	FCC-3PJV-JFTD (the same inputs always give the same reference)
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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/cane-preparation/cane-yard-overnight-stock

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.