Total Cane Preparation Power

Installed and absorbed power for knives and shredder together from a total kW per tonne fibre per hour and the knife share, after Hugot ch. 6.

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

Input parameters

Unit system: SI

Parameter	Value	Unit
Crushing rate	250.00	t/h
Fibre % cane	14.500	%
Total installed preparation power per tonne fibre per hour Hugot: 24–60, about 40 kW/(t fibre/h) on average; heavy-duty shredders much more.	40.000	kWh/t
Share of the installed power in the knives Hugot: 46 % knives, 54 % shredder on average.	46.000	%
Absorbed / installed Hugot: 50–60 %.	55.000	%

Calculated results

Parameter	Value	Unit
Installed preparation power	1,450.0	kW
Installed in the knives	667.00	kW
Installed in the shredder	783.00	kW
Mean absorbed power	797.50	kW
Absorbed energy per tonne of cane	3.1900	kWh/t

Formula and method

$$P_i = e\,A f, \quad P_k = s_k P_i, \quad P_s = (1 - s_k) P_i, \quad P_a = \varphi P_i, \quad E_c = \frac{P_a}{A}$$

Variables

A	Crushing rate	kg/s
f	Fibre % cane	-
e	Total installed preparation power per tonne fibre per hour	J/kg
s_k	Share of the installed power in the knives	-
φ	Absorbed / installed	-
P_i	Installed preparation power	W
P_k	Installed in the knives	W
P_s	Installed in the shredder	W
P_a	Mean absorbed power	W
E_c	Absorbed energy per tonne of cane	J/kg

Method and standards

Specific power on the fibre rate.

Assumptions and limits

- Averages from practice. The specific power is per tonne of fibre per hour (shown in kWh/t = kW per t/h), not per tonne of cane; E_c is the absorbed energy per tonne of cane.

References

- Hugot
- Handbook of Cane Sugar Engineering
- 3rd ed. (Elsevier, 1986)
- ch. 6
- total power for cane preparation
- p. 70

Report details

Report reference	FCC-YPSF-6P65 (the same inputs always give the same reference)
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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/cane-preparation/cane-preparation-power

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.