Cane Yard Area from Stock and Bulk Density

Yard area to stack a cane stock at a bulk density and stack height, with an allowance for roads and handling space; bulk densities from Hugot ch. 1.

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

Input parameters

Unit system: SI

Parameter	Value	Unit
Cane stock	3,750.0	t
Bulk density of the stacked cane Hugot ch. 1: grab-loaded 200, carefully loaded 300, hand bundles 350–400, chopped cane 300–380 kg/m³.	300.00	kg/m³
Mean stack height	3.0000	m
Share of the yard area that holds cane The rest is roads, cranes and turning space.	60.000	%

Calculated results

Parameter	Value	Unit
Stack volume	12,500	m³
Area under cane	4,166.7	m²
Gross yard area	6,944.4	m²

Formula and method

$$V = \frac{P}{\rho_b}, \quad A_n = \frac{V}{H}, \quad A_g = \frac{A_n}{u}$$

Variables

P	Cane stock	kg
ρ_b	Bulk density of the stacked cane	kg/m³
H	Mean stack height	m
u	Share of the yard area that holds cane	-
V	Stack volume	m³
A_n	Area under cane	m²
A_g	Gross yard area	m²

Method and standards

Mass, volume and area for a stack of mean height H.

Assumptions and limits

- Mean stack height over the whole cane area. A note appears for a bulk density outside Hugot's 200–400 kg/m³.

References

• Hugot
• Handbook of Cane Sugar Engineering
• 3rd ed. (Elsevier, 1986)
• ch. 1
• bulk densities of cane
• p. 1

Report details

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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-area

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.