Mill Capacity Reduced to a Standard Roller (Hugot)

Ratio that reduces a mill to Hugot's standard 762 × 1524 mm roller (eqn 12.7), and the crushing rate expressed on standard rollers, for comparing tandems.

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

Input parameters

Unit system: SI

Parameter	Value	Unit
Roller diameter	0.91400	m
Roller length	1.8290	m
Standard roller diameter	0.76200	m
Standard roller length	1.5240	m
Crushing rate	200.00	t/h

Calculated results

Parameter	Value	Unit
Reduction ratio L_sD_s²/(LD²)	0.57915	
Mill size relative to standard	1.7267	
Crushing rate per standard mill size	115.83	t/h

Formula and method

$$r = \frac{L_s D_s^2}{L D^2}, \quad A_s = A\,r$$

Variables

D	Roller diameter	m
L	Roller length	m
D_s	Standard roller diameter	m
L_s	Standard roller length	m
A	Crushing rate	kg/s
r	Reduction ratio L_sD_s²/(LD²)	-
$1/r$	Mill size relative to standard	-
A_s	Crushing rate per standard mill size	kg/s

Method and standards

Hugot's geometric reduction.

Assumptions and limits

- Same speed and preparation. Hugot's capacity formula also has a speed factor n(1 − 0.06 n D), which this geometric reduction leaves out; mills of different diameter at the same rpm therefore are not compared on equal terms.

References

- Hugot
- Handbook of Cane Sugar Engineering
- 3rd ed. (Elsevier, 1986)
- ch. 12
- eqn 12.7
- p. 194

Report details

Report reference	FCC-7CBB-X7FD (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/milling/mill-capacity-standard-roller

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.