Milk of Lime: Baumé, Density and Dose

Specific gravity and density of milk of lime from degrees Baumé, CaO needed per hour from the dose per tonne of cane, and the milk-of-lime flow.

Method: Baumé heavy-liquid scale SG = 145/(145 − °Bé) (US standard modulus 145); Mass balance for the lime dose

Input parameters

Unit system: SI

Parameter	Value	Unit
Baumé (heavy-liquid scale)	15.000	
CaO content of the milk of lime From your lab or the lime table for the Baumé reading.	150.00	g/L
Lime dose as CaO per tonne cane Hugot ch. 24: 0.5–0.8 kg CaO per t cane for raw sugar; hot liming takes 15–20 % less.	0.90000	kg/t
Crushing rate	250.00	t/h

Calculated results

Parameter	Value	Unit
Specific gravity 145/(145 − °Bé)	1.1154	
Density (water at 60 °F, 999.0 kg/m³)	1,114.3	kg/m³
CaO needed	225.00	kg/h
Milk-of-lime flow	1,500.0	L/h

Formula and method

$$SG = \frac{145}{145 - {}^{\circ}B\acute{e}}, \quad \dot{V} = \frac{d\,C}{c_{CaO}}$$

Variables

$^{\circ}B\acute{e}$	Baumé (heavy-liquid scale)	-
c_{CaO}	CaO content of the milk of lime	kg/m³
d	Lime dose as CaO per tonne cane	kg/kg
C	Crushing rate	kg/s
SG	Specific gravity 145/(145 − °Bé)	-
ρ	Density (water 999.0 kg/m³)	kg/m³
$\dot{m}_{CaO}$	CaO needed	kg/s
$\dot{V}$	Milk-of-lime flow	m³/s

Method and standards

Baumé scale; mass balance.

Assumptions and limits

- Uniform suspension.
- The CaO content is your own figure; it is not checked against the Baumé reading, and the specific gravity and density do not enter the dose. Take the CaO for the reading from your laboratory's lime table.
- Density = SG × 999.0 kg/m³, the density of water at 60 °F (15.6 °C), the reference of the US Baumé scale.

References

- Baumé heavy-liquid scale SG = 145/(145 − °Bé) (US standard modulus 145)
- Mass balance for the lime dose

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/clarification/milk-of-lime-dose

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.