Sugar Colour in ICUMSA Units

Colour of a sugar solution in ICUMSA units from its absorbance, the cell length and the solution's concentration from brix and density.

Method: ICUMSA colour definition: IU = 1000 A/(b c); b in cm; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Absorbance at 420 nm (filtered, pH adjusted)	0.12000	
Cell length	1.0000	cm
Solution brix	50.000	%
Solution density	1,230.0	kg/m³

Calculated results

Parameter	Value	Unit
Concentration (g of solids per mL)	0.61500	
Colour, ICUMSA units	195.12	

Notes for this case

- Absorbance outside about 0.2–0.8: the photometer reading is less precise; change the cell length or the dilution.
- Use the density of the solution at the measured brix; the ICUMSA method fixes pH, filtration and wavelength.

Formula and method

$$IU = \frac{1000\,A}{b\,c}, \quad c = \frac{Bx\,\rho}{1000}$$

Variables

A	Absorbance at 420 nm (filtered, pH adjusted)	-
b	Cell length	m
Bx	Solution brix	-
ρ	Solution density	kg/m³
C	Concentration (g of solids per mL)	-
IU	Colour, ICUMSA units	-

Method and standards

ICUMSA definition.

Assumptions and limits

- Method conditions as ICUMSA.
- Brix and density are separate inputs and are not checked against each other: enter the density that belongs to the brix (for example from a sucrose density table).
- A note appears for absorbances outside about 0.2–0.8, where photometer readings are less precise.

References

- ICUMSA colour definition: IU = 1000 A/(b c)
- b in cm
- c in g/mL (ICUMSA Methods GS2/3-10 and GS1/3-7)

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/centrifugals-sugar-house/icumsa-colour

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.