Ice Cream Mix Calculation from Cream, Skim Milk Powder and Sugar

Quantities of cream, skim milk powder, sugar, stabiliser and water for an ice cream mix with target fat, milk solids-not-fat, sugar and stabiliser contents.

Method: Component mass balance of the mix

Input parameters

Unit system: SI

Parameter	Value	Unit
Batch mass	100.00	kg
Fat wanted	10.000	%
Milk solids-not-fat wanted	11.000	%
Sugar wanted	15.000	%
Stabiliser and emulsifier	0.30000	%
Fat in the cream	40.000	%
SNF in the cream's serum	9.0000	%
SNF in the skim milk powder	97.000	%

Calculated results

Parameter	Value	Unit
Cream	25.000	kg
Skim milk powder	9.9485	kg
Sugar	15.000	kg
Stabiliser	0.30000	kg
Water	49.752	kg
Total solids of the mix	36.300	%

Notes for this case

• The mix is balanced component by component: cream supplies all the fat and some solids-not-fat in its serum; skim milk powder makes up the rest of the SNF; sugar and stabiliser are weighed directly; water (or skim milk, counted accordingly) brings the batch to mass. Typical mixes have 10–12 % fat, 10–11 % MSNF and 14–16 % sugar, about 36–40 % total solids. Too much MSNF for the water risks sandiness from lactose crystals.

Formula and method

$$m_c = \frac{m x_f}{f_c}, \quad m_p = \frac{m x_s - m_c (1 - f_c) s_c}{s_p}, \quad m_w = m - \sum m_i$$

Variables

m	Batch mass	kg
x_f	Fat wanted	-
x_s	Milk solids-not-fat wanted	-
x_{su}	Sugar wanted	-
x_{st}	Stabiliser and emulsifier	-
f_c	Fat in the cream	-
s_c	SNF in the cream's serum	-

s_p	SNF in the skim milk powder	-
m_c	Cream	kg
m_p	Skim milk powder	kg
m_{su}	Sugar	kg
m_{st}	Stabiliser	kg
m_w	Water	kg
TS	Total solids of the mix	-

Method and standards

Ice cream mix.

Assumptions and limits

- Ingredient compositions as entered.

References

Component mass balance of the mix

Report details

Report reference	FCC-5M1Z-Q5A6 (the same inputs always give the same reference)
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Calculator	Ice Cream Mix Calculation from Cream, Skim Milk Powder and Sugar
Method last reviewed	17 November 2026
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Release checks	3 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/chemical/food-dairy/ice-cream-mix-calculation

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.