Mixer and Splitter Mass Balance

Combined flow and composition of up to three streams mixed together, and the two outlet streams when the mixture is split in a chosen ratio.

Method: Total and component mass balances

Input parameters

Unit system: SI

Parameter	Value	Unit
Stream 1: mass flow	1,000.0	kg/h
Stream 1: component mass fraction	40.000	%
Stream 2: mass flow	500.00	kg/h
Stream 2: component mass fraction	10.000	%
Stream 3: mass flow	0	kg/h
Stream 3: component mass fraction	0	%
Share sent to outlet A	70.000	%

Calculated results

Parameter	Value	Unit
Mixed flow	1,500.0	kg/h
Mixed composition	30.000	%
Component flow	450.00	kg/h
Outlet A	1,050.0	kg/h
Outlet B	450.00	kg/h

Notes for this case

- A splitter divides flow only; both outlets have the mixed composition.

Formula and method

$$\dot{m} = \sum \dot{m}_i, \quad x = \frac{\sum \dot{m}_i x_i}{\dot{m}}, \quad \dot{m}_A = s\dot{m}$$

Variables

$\dot{m}_1$	Stream 1: mass flow	kg/s
x_1	Stream 1: component mass fraction	-
$\dot{m}_2$	Stream 2: mass flow	kg/s
x_2	Stream 2: component mass fraction	-
$\dot{m}_3$	Stream 3: mass flow	kg/s
x_3	Stream 3: component mass fraction	-
s	Share sent to outlet A	-
$\dot{m}$	Mixed flow	kg/s
x	Mixed composition	-
$\dot{m}_c$	Component flow	kg/s
$\dot{m}_A$	Outlet A	kg/s
$\dot{m}_B$	Outlet B	kg/s

Method and standards

Mass balances.

Assumptions and limits

- Steady state.

References

- Total and component mass balances

Report details

Report reference	FCC-DWF1-H42F (the same inputs always give the same reference)
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Calculator	Mixer and Splitter Mass Balance
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Software release	FireCAD Calc, release of 17 November 2026
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/chemical/mass-energy-balance/mixer-splitter-balance

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.