Compost Mix: Carbon-to-Nitrogen Ratio and Moisture

Carbon-to-nitrogen ratio and moisture of a two-material compost mix, and the mass of the second material needed to reach a target C:N.

Method: Mass balance of carbon; nitrogen and water (Haug, The Practical Handbook of Compost Engineering, ch. 6)

Input parameters

Unit system: SI

Parameter	Value	Unit
Mass of material 1 (wet)	1,000.0	kg
Carbon, material 1 (dry basis)	45.000	%
Nitrogen, material 1 (dry basis)	3.0000	%
Moisture, material 1 (wet basis)	75.000	%
Mass of material 2 (wet)	400.00	kg
Carbon, material 2 (dry basis)	45.000	%
Nitrogen, material 2 (dry basis)	0.50000	%
Moisture, material 2 (wet basis)	15.000	%
Target C:N	30.000	

Calculated results

Parameter	Value	Unit
C:N of the mix	28.859	
Moisture of the mix	57.857	%
Mass of material 2 for the target	441.18	kg

Notes for this case

- Target 25–35 C:N and 50–60 % moisture for active composting.

Formula and method

$$\frac{C}{N}=\frac{\sum m_i(1-M_i)C_i}{\sum m_i(1-M_i)N_i},\quad M=\frac{\sum m_i M_i}{\sum m_i},\quad m_{2,t}=\frac{m_1(1-M_1)(R_tN_1-C_1)}{(1-M_2)(C_2-R_tN_2)}$$

Variables

m_1	Mass of material 1 (wet)	kg
C_1	Carbon, material 1 (dry basis)	-
N_1	Nitrogen, material 1 (dry basis)	-
M_1	Moisture, material 1 (wet basis)	-
m_2	Mass of material 2 (wet)	kg
C_2	Carbon, material 2 (dry basis)	-
N_2	Nitrogen, material 2 (dry basis)	-
M_2	Moisture, material 2 (wet basis)	-
R_t	Target C:N	-
C/N	C:N of the mix	-
M	Moisture of the mix	-
$m_{2,t}$	Mass of material 2 for the target	kg

Method and standards

Mass balance.

Assumptions and limits

- Two materials; dry-basis analyses.

References

- Mass balance of carbon
- nitrogen and water (Haug, The Practical Handbook of Compost Engineering, ch. 6)

Report details

Report reference	FCC-ZA4W-69W0 (the same inputs always give the same reference)
Generated	17 November 2026, 19:48 UTC
Calculator	Compost Mix: Carbon-to-Nitrogen Ratio and Moisture
Method last reviewed	13 November 2026
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/environmental/wastewater/compost-cn-moisture

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.