Paddy Drying: Water Removed and Heat

Water to remove when paddy is dried from harvest to storage moisture (wet basis), the dried paddy mass, and the heat and fuel at a specific heat use per kg water.

Method: Definitions and mass and energy balances: dry matter balance on wet-basis moisture

Input parameters

Unit system: SI

Parameter	Value	Unit
Wet paddy	10,000	kg
Harvest moisture (wet basis)	24.000	%
Storage moisture (wet basis)	14.000	%
Heat per kg of water removed Use your dryer's measured figure; the default 5 MJ/kg is a typical mid value for batch and recirculating dryers, not a sourced constant.	5.0000	MJ/kg
Fuel (husk) heating value	14.000	MJ/kg

Calculated results

Parameter	Value	Unit
Dried paddy	8,837.2	kg
Water removed	1,162.8	kg
Heat	5.8140	GJ
Fuel	415.28	kg

Notes for this case

- Dry in stages with tempering below 40–45 °C grain temperature to avoid fissures and low head rice yield.

Formula and method

$$M_2 = M\frac{1-w_1}{1-w_2}, \quad M_w = M - M_2, \quad Q = M_w q, \quad M_f = \frac{Q}{LHV}$$

Variables

M	Wet paddy	kg
w_1	Harvest moisture (wet basis)	-
w_2	Storage moisture (wet basis)	-
q	Heat per kg of water removed	J/kg
LHV	Fuel (husk) heating value	J/kg
M_2	Dried paddy	kg
M_w	Water removed	kg
Q	Heat	J
M_f	Fuel	kg

Method and standards

Dry matter balance.

Assumptions and limits

- No dry matter loss.
- The heat per kg of water removed is the user's figure; the default 5 MJ/kg is a typical value, not from a cited source.

References

- Definitions and mass and energy balances: dry matter balance on wet-basis moisture

Report details

Report reference	FCC-SP9V-MX03 (the same inputs always give the same reference)
Generated	17 November 2026, 19:50 UTC
Calculator	Paddy Drying: Water Removed and Heat
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/chemical/textile-rice-oil/paddy-drying-water-removal

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.