Press Section Dryness: Water to Evaporate per Tonne

Water carried into the dryers per tonne of paper at the press-section exit dryness and final dryness, and the evaporation saved by one point more press dryness.

Method: Smook; Handbook for Pulp & Paper Technologists; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Dryness after the press section	45.000	%
Dryness at the reel	92.000	%
Paper production (at reel dryness)	1,000.0	t/d

Calculated results

Parameter	Value	Unit
Water evaporated per tonne of paper	1.0444	kg/kg
Evaporation	43.519	t/h
Saving per +1 point of press dryness	4.2553	%

Notes for this case

- Here one more point of press dryness cuts the water to evaporate by 4.3 %; dryer steam falls roughly in proportion. Pressing water out is far cheaper than drying it.

Formula and method

$$E = \frac{d_{reel}}{d_{press}} - 1, \quad \dot{E} = E\,P, \quad \Delta E = \frac{E - E(d_{press} + 0.01)}{E}$$

Variables

d_{press}	Dryness after the press section	-
d_{reel}	Dryness at the reel	-
P	Paper production (at reel dryness)	kg/s
E	Water evaporated per tonne of paper	kg/kg
$\dot{E}$	Evaporation	kg/s
ΔE	Saving per +1 point of press dryness	-

Method and standards

Water balance per tonne of paper at reel dryness.

Assumptions and limits

- No water added between press and reel.
- ΔE is the saving in water evaporated; dryer steam falls roughly in proportion.

References

- Smook
- Handbook for Pulp & Paper Technologists
- 3rd ed. (Angus Wilde, 2002)
- ch. 16.9 and 17 (pressing and drying; dryness definitions)

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/chemical/pulp-paper/press-dryness-water-removal

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.