Reservoir Evaporation Loss (Meyer's Formula)

Daily evaporation from a reservoir or pond by Meyer's formula from water and air vapour pressures and wind speed, with the daily volume lost over the water area.

Method: Meyer's formula (Subramanya, Engineering Hydrology, ch. 3); IAPWS-IF97 saturation pressure

Input parameters

Unit system: SI

Parameter	Value	Unit
Water surface temperature	27.000	°C
Air temperature	30.000	°C
Relative humidity	50.000	%
Wind speed at 9 m	3.0000	m/s
Meyer coefficient (0.36 large deep, 0.50 small shallow)	0.36000	
Water surface area	100.00	ha

Calculated results

Parameter	Value	Unit
Saturation vapour pressure at water temperature	26.761	mmHg
Air vapour pressure	15.926	mmHg
Evaporation (mm/day)	6.5335	
Volume lost per day	6,533.5	m³

Notes for this case

• Meyer (1915): E = C(e_w − e_a)(1 + u₉/16), E in mm/day, e in mm of mercury, u₉ in km/h at 9 m. Saturation pressures from IAPWS-IF97.

Formula and method

$$E = C(e_w - e_a)\left(1 + \frac{u_9}{16}\right) \quad (\text{mm/day};\ e \text{ in mm Hg};\ u_9 \text{ in km/h})$$

Variables

t_w	Water surface temperature	K
t_a	Air temperature	K
φ	Relative humidity	-
u_9	Wind speed at 9 m	m/s
C	Meyer coefficient (0.36 large deep, 0.50 small shallow)	-
A	Water surface area	m²
e_w	Saturation vapour pressure at water temperature	Pa
e_a	Air vapour pressure	Pa
E	Evaporation (mm/day)	-
V_d	Volume lost per day	m³

Method and standards

Meyer's formula.

Assumptions and limits

- Daily averages.

References

• Meyer's formula (Subramanya, Engineering Hydrology, ch. 3); IAPWS-IF97 saturation pressure

Report details

Report reference	FCC-X7FN-CCWX (the same inputs always give the same reference)
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Calculator	Reservoir Evaporation Loss (Meyer's Formula)
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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/civil/hydraulics/reservoir-evaporation-meyer

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.