Peak Flood by Dickens, Ryves and Inglis Formulas

Maximum flood discharge of a catchment from its area by the Dickens, Ryves and Inglis empirical formulas used in Indian practice.

Method: Classical engineering hydrology relations

Input parameters

Unit system: SI

Parameter	Value	Unit
Catchment area	500.00	km²
Dickens constant	11.400	
Ryves constant	6.8000	

Calculated results

Parameter	Value	Unit
Dickens	1,205.4	m³/s
Ryves	428.37	m³/s
Inglis (fan-shaped catchments)	2,744.3	m³/s
Dickens flood per km²	2.4108	m³/s

Notes for this case

• These regional formulas give peak flood (m³/s) from catchment area (km²) alone: Dickens Q = C_D·A^¾ for north and central India (C_D about 6 to 30, 11–14 typical), Ryves Q = C_R·A^⅔ for south India (C_R 6.8 near the coast, 8.5 inland, 10.2 for hilly areas) and Inglis Q = 124A/√(A + 10.4) for fan-shaped catchments in Maharashtra. They ignore rainfall intensity and return period, so use them only for preliminary estimates or checks of unit-hydrograph or frequency studies.

Formula and method

$$Q_D = C_D A^{3/4}, \quad Q_R = C_R A^{2/3}, \quad Q_I = \frac{124A}{\sqrt{A + 10.4}}$$

Variables

A	Catchment area	m²
C_D	Dickens constant	-
C_R	Ryves constant	-
Q_D	Dickens	m³/s
Q_R	Ryves	m³/s
Q_I	Inglis (fan-shaped catchments)	m³/s
q	Dickens flood per km²	m³/s

Method and standards

Flood formulas.

Assumptions and limits

- Area in km²; Q in m³/s.

References

Classical engineering hydrology relations

Report details

Report reference	FCC-WJZJ-GNGE (the same inputs always give the same reference)
Generated	23 November 2026, 17:51 UTC
Calculator	Peak Flood by Dickens, Ryves and Inglis Formulas
Method last reviewed	17 November 2026
Software release	FireCAD Calc, release of 22 November 2026
Release checks	3 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/empirical-flood-formulas

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Reopens the calculator with the inputs of this report.