Flow over a Rectangular or V-Notch Weir

Flow over a sharp-crested rectangular or V-notch (triangular) weir from the head over the crest and the discharge coefficient, and the head for a target flow.

Method: Sharp-crested weir equations

Input parameters

Unit system: SI

Parameter	Value	Unit
Weir type	V-notch (triangular)	
Crest width (rectangular)	1.0000	m
Notch angle (V-notch)	90.000	°
Head over the crest or notch bottom	200.00	mm
Discharge coefficient About 0.6 for sharp-crested weirs; calibrate or take it from the weir standard for accurate metering.	0.60000	
Target flow for the head output (0 = none)	0	m³/h

Calculated results

Parameter	Value	Unit
Flow over the weir	25.351	L/s

Notes for this case

- Free (aerated) nappe and negligible approach velocity; end contractions are taken into the coefficient.

Formula and method

$$Q = \frac{2}{3} C_d \, b \sqrt{2g} \; H^{3/2} \quad \text{(rectangular)}$$

$$Q = \frac{8}{15} C_d \tan\frac{\theta}{2} \sqrt{2g} \; H^{5/2} \quad \text{(V-notch)}$$

Variables

type	weir type	-
b	crest width	m
θ	notch angle	rad
H	head over the crest	m
C_d	discharge coefficient	-
Q_t	target flow	m³/s
Q	flow over the weir	m³/s
H_t	head for the target flow	m
g	standard gravity	m/s²

Method and standards

Integrating the ideal velocity √(2gh) over the opening gives the weir equations; the discharge coefficient accounts for contraction and losses. The head for a target flow inverts the same equation.

Assumptions and limits

- One constant discharge coefficient is used at every head. Standard weir methods (Kindsvater–Carter, ISO 1438) make the coefficient depend on head, crest height and width ratio, add an approach-velocity correction and set limits on head and dimensions; none of these is applied, so for metering use a calibrated coefficient or the standard's method.
- Free, aerated nappe; approach velocity negligible.

References

- Sharp-crested weir equations

Report details

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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/weir-flow

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.