

AJ Design

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## Orifice Equations Formulas Design Calculator

### Fluid Mechanics Hydraulics

Solving for flow rate.

$$Q = C_d A_o \sqrt{2gH}$$

**Inputs:**

discharge coefficient ( $C_d$ )	<input type="text" value=".61"/>	
orifice area ( $A_o$ )	<input type="text" value=".7854"/>	<input type="text" value="inch^2"/>
gravitational constant (g)	<input type="text" value="32.2"/>	<input type="text" value="foot/second^2"/>
center line head (H)	<input type="text" value=".25"/>	<input type="text" value="foot"/>

Calculate



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**Conversions:**

discharge coefficient ( $C_d$ )	
= .61	
= 0.61	
orifice area ( $A_o$ )	
= .7854	inch^2
= 0.000506708664	meter^2
gravitational constant (g)	
= 32.2	foot/second^2
= 9.81456	meter/second^2
center line head (H)	
= .25	foot
= 0.0762	meter

**Solution:**

flow rate (Q) = 0.0003780211211896 meter^3/second



**Other Units:**

= 0.0003780211211896	meter <sup>3</sup> /second
= 1360876.0362826	cc/hour
= 378.0211211896	centimeter <sup>3</sup> /second
= 1360876.0362826	centimeter <sup>3</sup> /hour
= 226.81267271331	deciliter/minute
= 0.80098139450965	foot <sup>3</sup> /minute
= 0.013349689908494	foot <sup>3</sup> /second
= 5.9917569251631	gallon/minute
= 32661.024879456	liter/day
= 22.681267226013	liter/minute
= 0.3780211211896	liter/second
= 32.661024870708	meter <sup>3</sup> /day
= 0.022681267271331	meter <sup>3</sup> /minute
= 1360876.0362826	milliliter/hour
= 22681.267271376	milliliter/minute

**Change Equation**

Select an equation to solve for a different unknown

$Q = C_d A_o \sqrt{2gH}$	Solve for flow rate.
$C_d = \frac{Q}{A_o \sqrt{2gH}}$	Solve for discharge coefficient.
$A_o = \frac{Q}{C_d \sqrt{2gH}}$	Solve for orifice area.
$g = \frac{\left(\frac{Q}{C_d A_o}\right)^2}{2H}$	Solve for gravitational constant.
$H = \frac{\left(\frac{Q}{C_d A_o}\right)^2}{2g}$	Solve for center line head.

## References - Books:

Martin Wanielista, Robert Kersten and Ron Eaglin. 1997. Hydrology Water Quantity and Quality Control. John Wiley & Sons. 2nd ed.

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