Brine or Glycol (Secondary Coolant) Flow for a Load

Mass and volume flow of a brine, glycol or other secondary coolant to carry a cooling load at a set temperature range, from its density and specific heat.

Method: Energy balance ṁ = Q/(c_p ΔT)

Input parameters

Unit system: SI

Parameter	Value	Unit
Cooling load	100.00	kW
Coolant temperature range	4.0000	K
Coolant density From the coolant maker's table at the mean temperature and concentration.	1,050.0	kg/m³
Coolant specific heat	3.6000	kJ/(kg·K)

Calculated results

Parameter	Value	Unit
Mass flow	25,000	kg/h
Volume flow	23.810	m³/h
Flow relative to water (4186 J/kg K, 1000 kg/m³)	1.1074	

Formula and method

$$\dot{m} = \frac{\dot{Q}}{c_p \Delta T}, \quad \dot{V} = \frac{\dot{m}}{\rho}$$

Variables

$\dot{Q}$	Cooling load	W
ΔT	Coolant temperature range	K
ρ	Coolant density	kg/m³
c_p	Coolant specific heat	J/(kg·K)
$\dot{m}$	Mass flow	kg/s
$\dot{V}$	Volume flow	m³/s
$\dot{V}/\dot{V}_w$	Flow relative to water (4186 J/kg K, 1000 kg/m³)	-

Method and standards

Energy balance.

Assumptions and limits

- Constant properties.

References

- Energy balance ṁ = Q/(c_p ΔT)

Report details

Report reference	FCC-DWPA-01MZ (the same inputs always give the same reference)
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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/hvac/chillers/secondary-coolant-flow

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.