Viscosity Converter: Dynamic ↔ Kinematic (cP, cSt, Pa·s, St)

Convert dynamic viscosity between Pa·s, mPa·s (cP), poise and lb/(ft·s), and to kinematic viscosity in m²/s, cSt, stokes and ft²/s with the fluid density.

Method: ν = μ/ρ; unit definitions per NIST SP 811

Input parameters

Unit system: SI

Parameter	Value	Unit
Dynamic viscosity (choose its unit)	50.000	cP
Density	890.00	kg/m³

Calculated results

Parameter	Value	Unit
pascal second	0.050000	Pa·s
centipoise (mPa·s)	50.000	cP
poise	0.50000	P
pound per foot second	0.033598	lb/(ft·s)
kinematic, m²/s	5.6180e-05	m²/s
kinematic, centistokes	56.180	cSt
kinematic, stokes	0.56180	St
kinematic, ft²/s	6.0471e-04	ft²/s

Notes for this case

- Saybolt and Redwood seconds are empirical and need their own tables; this converts absolute units only.

Formula and method

$$\nu = \frac{\mu}{\rho}$$

Variables

μ	Dynamic viscosity (choose its unit)	Pa·s
ρ	Density	kg/m³
ν	kinematic, m²/s	m²/s

Method and standards

Definition.

Assumptions and limits

- The input is a dynamic viscosity. To start from a kinematic value (a furnace oil in cSt, say), use the dynamic and kinematic viscosity conversion calculator, which takes either.
- Newtonian fluid.

References

- ν = μ/ρ; unit definitions per NIST SP 811

Report details

Report reference	FCC-FH0S-M8Y2 (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/general/unit-conversions/viscosity-unit-converter

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.