Pipe Flushing Flow, Velocity and Water Volume

Flow rate for a flushing velocity in a pipe, the Reynolds number, water volume per pipe volume and total water and time for a number of flushes.

Method: Flushing flow and volume

Input parameters

Unit system: SI

Parameter	Value	Unit
Pipe inside diameter	150.00	mm
Pipe length	500.00	m
Flushing velocity	1.5000	m/s
Pipe volumes to flush	3.0000	
Water temperature	20.000	°C

Calculated results

Parameter	Value	Unit
Flushing flow	95.426	m³/h
Reynolds number	224,272	
Pipe volume	8.8357	m³
Total flushing water	26.507	m³
Flushing time	16.667	min

Notes for this case

• Q = v·πD²/4; time = n·L/v. Flushing to remove debris needs velocities above normal service (often 1.5–3 m/s for water lines); lube and hydraulic oil flushing targets turbulent flow, a Reynolds number of several thousand.

Formula and method

$$Q = v\frac{\pi D^2}{4}, \quad V_t = nLA, \quad t = \frac{nL}{v}$$

Variables

D	Pipe inside diameter	m
L	Pipe length	m
v	Flushing velocity	m/s
n	Pipe volumes to flush	-
T	Water temperature	K
Q	Flushing flow	m³/s
Re	Reynolds number	-
V_p	Pipe volume	m³
V_t	Total flushing water	m³
t	Flushing time	s

Method and standards

Flushing.

Assumptions and limits

- Full pipe; steady flow.

References

Flushing flow and volume

Report details

Report reference	FCC-3X19-RHXF (the same inputs always give the same reference)
Generated	23 November 2026, 17:50 UTC
Calculator	Pipe Flushing Flow, Velocity and Water Volume
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/mechanical/piping/pipe-flushing-velocity-volume

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.