Flowmeter K-Factor and Meter Factor from a Proving Run

K-factor and meter factor of a pulse flowmeter from a proving or calibration run: pulses counted, true volume from the prover or tank, and indicated volume.

Method: Meter factor MF = true volume / indicated volume (API MPMS ch. 4 terminology)

Input parameters

Unit system: SI

Parameter	Value	Unit
Pulses counted in the run	50,120	
True volume (prover or tank)	5.0000	m³
K-factor programmed in the meter, in pulses per m³ (per litre × 1000; per US gal × 264.17)	10,000	

Calculated results

Parameter	Value	Unit
Measured K-factor (pulses per m³)	10,024	
Volume indicated by the meter	5.0120	m³
Meter factor (true / indicated)	0.99761	
Meter error (indicated − true) / true	0.24000	%

Formula and method

$$K = \frac{N}{V_t}, \quad V_i = \frac{N}{K_0}, \quad MF = \frac{V_t}{V_i}$$

Variables

N	Pulses counted in the run	-
V_t	True volume (prover or tank)	m³
K_0	K-factor programmed in the meter (pulses per m³)	-
K	Measured K-factor (pulses per m³)	-
V_i	Volume indicated by the meter	m³
MF	Meter factor (true / indicated)	-
ε	Meter error (indicated − true) / true	-

Method and standards

Definitions.

Assumptions and limits

- Steady flow during the run.
- No temperature and pressure corrections (CTL, CPL) of the prover and meter volumes as in API MPMS proving; for liquids away from reference conditions apply them first.
- K-factors in pulses per m³: multiply a per-litre figure by 1 000 or a per-US-gallon figure by 264.17.

References

- Meter factor MF = true volume / indicated volume (API MPMS ch. 4 terminology)

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/instrumentation/flow/meter-factor-proving

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.