Engine Displacement and Mean Piston Speed

Swept volume of an engine from bore, stroke and cylinders, and the mean piston speed at a running speed.

Method: V_s = (π/4)B²S z; mean piston speed 2SN

Input parameters

Unit system: SI

Parameter	Value	Unit
Bore	105.00	mm
Stroke	120.00	mm
Number of cylinders	6.0000	
Speed	1,500.0	rpm

Calculated results

Parameter	Value	Unit
Swept volume per cylinder	1.0391	L
Total displacement	6.2345	L
Mean piston speed 2SN	6.0000	m/s

Formula and method

$$V_{s,1} = \frac{\pi B^2}{4} S, \quad V_s = V_{s,1} z, \quad \bar{c}_m = 2SN$$

Variables

B	Bore	m
S	Stroke	m
z	Number of cylinders	-
N	Speed	1/s
$V_{s,1}$	Swept volume per cylinder (not the clearance volume V_c)	m³
V_s	Total displacement	m³
$\bar{c}_m$	Mean piston speed 2SN	m/s

Method and standards

Geometry.

Assumptions and limits

- Reciprocating engine.

References

- V_s = (π/4)B²S z; mean piston speed 2SN

Report details

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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/automotive/engine/engine-displacement-piston-speed

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.