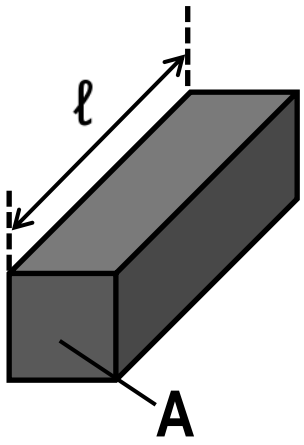
A

The electrical resistance of a given material will decrease with increasing height.

Pouillet's law

$$R = \rho\frac{\ell}{A}$$



where
R is the electrical resistance of a uniform specimen of the material (measured in ohms, Ω) ;

ρ is the electrical resistivity of a uniform specimen of the material (measured in ohms·meter, Ω·m) ;

ℓ is the length of the piece of material (measured in metres, m);

A is the cross-sectional area of the specimen (measured in square metres, m^2).

$$\boldsymbol{A = H \cdot W}$$

where
H is the height of chamber;
W is the width of chamber.

B

$$I = \left(\frac{V \cdot W}{\rho \cdot \ell}\right) \cdot H$$

$$\alpha = \frac{V \cdot W}{\rho \cdot \ell}$$

$$I = \alpha H$$

C

$$Q = \left(\frac{V^2 \cdot W}{\rho \cdot \ell}\right) \cdot H$$

$$\beta = \frac{V^2 \cdot W}{\rho \cdot \ell}$$

$$Q = \beta H$$

sFigure 3 Both electric currents and Joule heating will increase proportionally with thickness of chamber/tissue. (A) By Pouillet's law, the electrical resistance of a given material will decrease with increasing the height. Therefore, **(B)** electric currents will increase proportionally with thickness of chamber/tissue, and **(C)** Joule heating will increase proportionally with thickness of chamber/tissue.