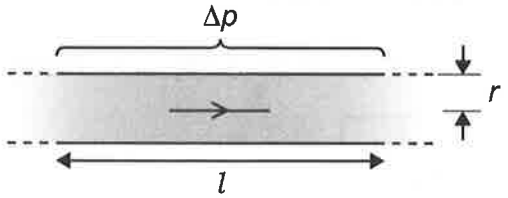
3 A measurement of the ease with which a liquid flows through a pipe is called fluidity φ.



The volume V of liquid flowing through length l of a pipe of radius r in time t is measured, as is the pressure difference Δp across this length. The fluidity φ is calculated using the following equation.

$$\frac{V}{t} = \frac{\pi \varphi r^4 \Delta p}{8l}$$

What is the unit of fluidity expressed in base units?

A $\mathrm{kg\,m\,s^{-1}}$ **B** $\mathrm{kg\,m^{-1}\,s^{-1}}$ **C** $\mathrm{kg^{-1}\,m\,s}$ **D** $\mathrm{kg^{-1}\,m^{-1}\,s}$