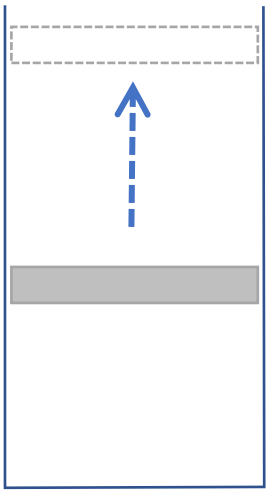
In a piston-cylinder device, if the piston is weighted and free to move, the process will be a constant-pressure (isobaric) process. Why?

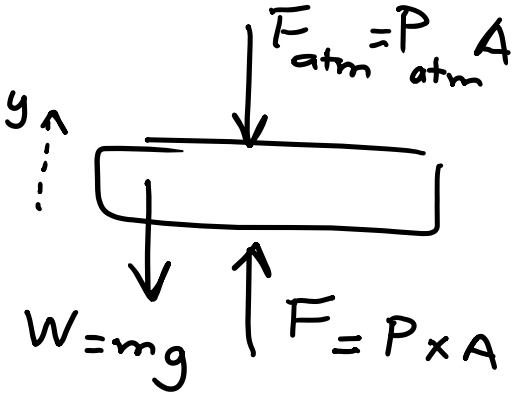


Draw a free-body diagram for the piston:

$\sum F_y = m a_y \overset{\text{(very slow process)}}{\rightarrow} 0$

$P \times A - mg - P_{atm} A = 0$

$P = \frac{mg}{A} + P_{atm}$



All the quantities on the right-hand side do not change from the beginning of the process until the end.

→ P = constant → Isobaric process