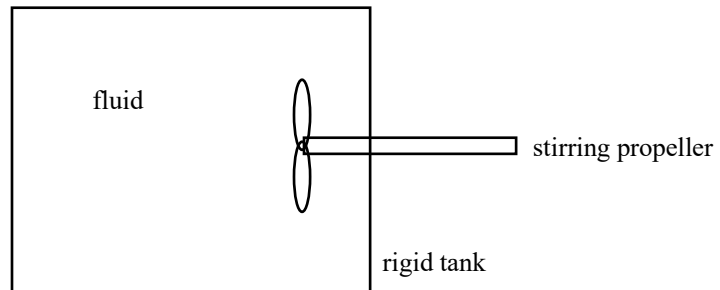


A rigid tank contains a hot fluid that is cooled while being stirred. Initially the internal energy of the fluid is 800 kJ. During the cooling process, the fluid loses 500 kJ of heat and the stirring propeller does 100 kJ of work on the fluid. What is the final internal energy of the fluid?



SOLUTION:

Apply the First Law to the system of fluid contained within the tank.

$$\Delta E = E_f - E_i = Q_{\text{into system}} + W_{\text{on system}}$$

where

$$E_i = U_i = 800 \text{ kJ}$$

$$Q_{\text{into system}} = -500 \text{ kJ}$$

$$W_{\text{on system}} = 100 \text{ kJ}$$

$$\Rightarrow \boxed{E_f = U_f = 400 \text{ kJ}}$$

