Isentropc efficiency

A pump increases the pressure of a saturated liquid at 50 kPa to a pressure of 4 MPa. It has an isentropic efficiency of 0.8. How much work does this pump require?

Answer: 5 kJ/kg.

Explanation: The ideal increase in enthalpy can be calculated using $\Delta h = \Delta P \cdot v$. Next simply divide by the isotropic efficiency to find actual h increase.

$$\Delta h_{2s} = v \cdot \Delta P = 0.001030 \cdot 3950 = 4 \frac{kJ}{kg}$$

$$\Delta h_2 = \frac{\Delta h_{2s}}{\eta_{iso}} = \frac{4}{0.8} = 5 \frac{kJ}{kg}$$