

36.56 A threaded $\frac{3}{4}$ in pipe has (4) 90-degree long radius elbows and (6) 45-degree elbows. The volume flow rate is 5gpm. What is the minor head loss for the system?

- A. 0.2ft
- B. 0.3ft
- C. 0.7ft
- D. 0.8ft

Use the equation for head loss from **Fittings Losses**.

$$h_{f,minor} = K \left(\frac{v^2}{2g} \right)$$

Use the **Steel Pipe Friction Tables** to find the velocity for 5gpm flowing in a nominal $\frac{3}{4}$ in pipe.

$$v = 3.01 \frac{ft}{s}$$

Look up the **K-Factors** for **Threaded Pipe Fittings** and obtain the values for 90-degree long radius elbows and 45-degree elbows. Take the sum accounting for the quantities to find the value of K in total.

$$K = 4(0.92) + 6(0.35) = 5.78$$

Solve for the minor losses.

$$h_{f,minor} = (5.78) \frac{\left(3.01 \frac{ft}{s}\right)^2}{2 \left(32.2 \frac{ft}{s^2}\right)} = 0.8ft$$

Answer D