

**36.60** An atypical hydronic system permits the velocity of water to reach a maximum of  $12 \frac{ft}{s}$  when required. What is the smallest nominal schedule 40 steel pipe size that should be selected for a flow rate of  $50 gpm$ ?

- A.  $1in$
- B.  $1.25in$
- C.  $1.5in$
- D.  $2in$

Use the relation  $Q = vA$  to specify the required area. Express area as  $A = \frac{\pi}{4}D^2$  and solve for the minimum diameter.

$$A = \frac{Q}{v}$$

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$$\frac{\pi}{4}D^2 = \frac{Q}{v}$$

$$D = \sqrt{\frac{4Q}{\pi v}} = \sqrt{\frac{4 \left( 50 \frac{gal}{min} \right) \left( \frac{1ft^3}{7.48gal} \right) \left( \frac{1min}{60s} \right)}{\pi \left( 12 \frac{ft}{s} \right)}} = 0.109ft \left( \frac{12in}{1ft} \right) = 1.30in$$

Refer to the **Schedule 40 Steel Pipe** table. The inside diameter of a  $1.25in$  nominal pipe size is physically  $1.38in$ . There is no need to choose a larger size.

**Answer B**