

1.91

1.91 When water at 70°C flows through a converging section of pipe, the pressure decreases in the direction of flow. Estimate the minimum absolute pressure that can develop without causing cavitation. Express your answer in both BG and SI units.

Cavitation may occur in the converging section of pipe when the pressure equals the vapor pressure. From Table B.2 in Appendix B for water at 70°C , $p_v = 31.2 \text{ kPa (abs)}$. Thus,

minimum pressure = 31.2 kPa (abs) in SI units.

In BG units

$$\begin{aligned} \text{minimum pressure} &= \left(31.2 \times 10^3 \frac{\text{N}}{\text{m}^2} \right) \left(1.450 \times 10^{-4} \frac{\text{PSI}}{\frac{\text{N}}{\text{m}^2}} \right) \\ &= \underline{\underline{4.52 \text{ psia}}} \end{aligned}$$