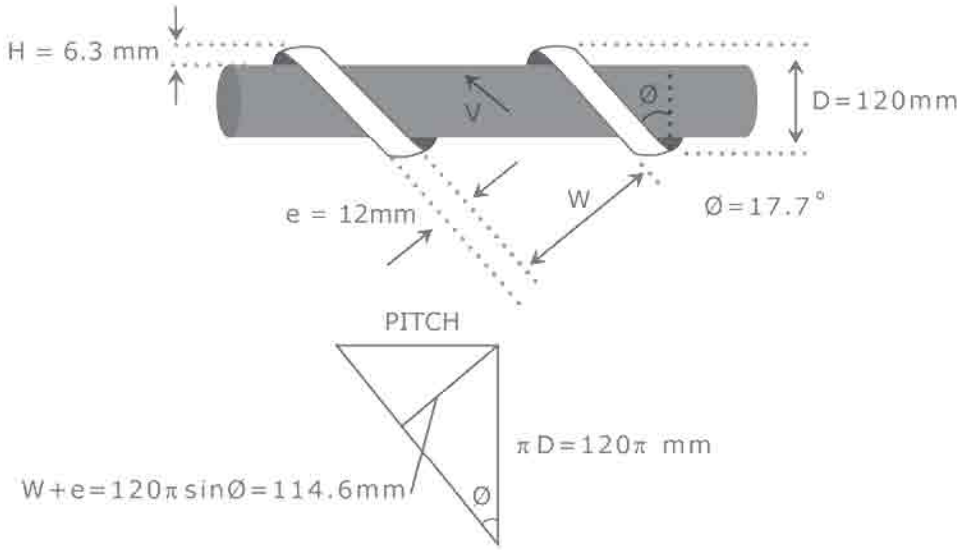


7.15



Channel width:

$$W + e = \pi D \sin \theta$$

$$= \pi (120) \sin 17.7$$

$$= 114.6 \text{ mm}$$

$$W = 114.6 - 12$$

$$= 102.6 \text{ mm}$$

Velocity:

$$V = \pi \frac{N}{60} D \cos \theta$$

$$V = \pi \frac{60}{60} (.12) (\cos 17.7^\circ) = 0.359 \text{ m/s}$$

Open discharge rate: $Q_0 = \frac{1}{2} V H W$

$$Q_0 = \frac{1}{2} (0.359) (.0063) (.1026) = 1.16 \times 10^{-4} \text{ m}^3/\text{s}$$

Back flow: $Q_p = \frac{W H^3}{12 \mu} \cdot \frac{\Delta P}{\Delta L}$

shear rate: $\dot{\gamma} = \frac{V}{H} = \frac{0.359}{0.0063} = 57 \text{ s}^{-1}$

from graph: $\log \mu = 3.4$

$$\rightarrow \mu = 2512 \text{ Pa}\cdot\text{s}$$

$$Q_p = \frac{(.1026) (.0063)^3}{12 (2512)} \cdot \frac{\Delta P}{A/\sin 17.7}$$

$$= 6.47 \times 10^{-13} \Delta P$$

