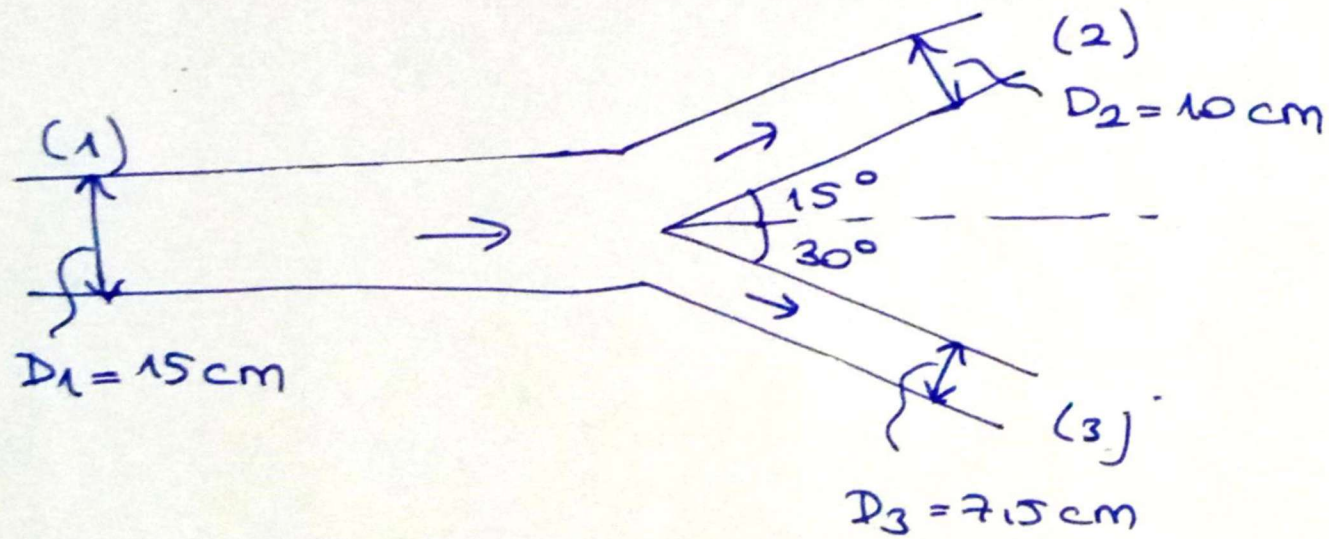


REAKSIYON KUVVETİ



Free Jet
$V_2 = V_3 = 12 \text{ m/s}$

Y sistemi dengede tutmak için gereken "Reaksiyon Kuvvetini" bulun.

$z_1 = z_2 = z_3$

$P_2 = P_3 = 0$

Süreklilik Denklemi

$$A_1 = \frac{\pi \times D_1^2}{4} = \frac{\pi \times 0,15^2}{4} = 0,0177 \text{ m}^2$$

$$A_2 = \frac{\pi \times D_2^2}{4} = \frac{\pi \times 0,1^2}{4} = 0,0079 \text{ m}^2$$

$$A_3 = \frac{\pi \times D_3^2}{4} = \frac{\pi \times 0,075^2}{4} = 0,0044 \text{ m}^2$$

$$Q_1 = Q_2 + Q_3$$

$$V_1 A_1 = V_2 A_2 + V_3 A_3$$

$$V_1 \times 0,0177 = 12 \times 0,0079 + 12 \times 0,0044$$

$$V_1 = 8,34 \text{ m/s}$$

$$Q_1 = 8,34 \times 0,0177 = 0,148 \text{ m}^3/\text{s}$$

$$Q_2 = 12 \times 0,0079 = 0,095 \text{ m}^3/\text{s}$$

$$Q_3 = 12 \times 0,0044 = 0,053 \text{ m}^3/\text{s}$$

BERKE ARSLAN

Arslan

Bernoulli Denklemi (1) ve (2) arasında

$$\frac{P_1}{\gamma} + \frac{V_1^2}{2g} + z_1 = \frac{P_2}{\gamma} + \frac{V_2^2}{2g} + z_2$$

$$\frac{P_1}{9810} + \frac{8,34^2}{2 \times 9,81} = \frac{12^2}{2 \times 9,81}$$

$$\underline{P_1 = 37240 \text{ Pa}}$$

$$\sum F_x = 0$$

$$P_1 A_1 + \rho Q_1 V_1 - \rho Q_2 V_2 \times \cos 15^\circ - \rho Q_3 V_3 \times \cos 30^\circ = R_x$$

$$37240 \times 0,0177 + 1000 \times 0,1148 \times 8,34 - 1000 \times 0,095 \times 12 \times \cos 15^\circ$$

$$- 1000 \times 0,053 \times 12 \times \cos 30^\circ = R_x$$

$$R_x = 241 \text{ N}$$

$$\sum F_y = 0$$

$$-\rho Q_2 V_2 \sin 15^\circ + \rho Q_3 V_3 \times \sin 30^\circ + R_y = 0$$

$$-1000 \times 0,095 \times 12 \times \sin 15^\circ + 1000 \times 0,053 \times 12 \times \sin 30^\circ + R_y = 0$$

$$R_y = -23 \text{ N}$$

$$R = \sqrt{241^2 + 23^2} = 242 \text{ N}$$

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Serbest Cisim Diyagramı

