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Page

### Optimisation of L/D Ratio.

- material Volume
- Cost of material

(elliptical head) @ 2t



Let the diameter - D  
length - L.

Volume of material =  $(\pi D L)t + \left(\frac{\pi D^2}{4}\right)t + \left(\frac{\pi D^2}{4}\right) \times 2t$

$$V = t \left[ \pi D L + \frac{\pi D^2 t}{2} \right] \quad \text{--- (i)}$$

Volume of ~~sheet~~ Container =  $\left[ \frac{\pi D^2}{4} \right] \cdot L$

$$L = \frac{4V}{\pi D^2}$$

$$V = t \left[ \pi \times D \times \frac{4V}{\pi D^2} + \frac{\pi D^2 t}{2} \right]$$

$$V = t \left[ \frac{4V}{D} + \frac{\pi D^2 t}{2} \right]$$

$$\left[ \frac{PD}{2f_j} + C \right]$$

$$V = \left[ \frac{PD}{2f_j} + C \right] \left[ \frac{4V}{D} + \frac{\pi D^2 t}{2} \right]$$

$$\frac{dV}{dD} = 0 + \frac{2PV}{f_j} - \frac{P\pi D^3}{4f_j} + \frac{4VC}{D} + \frac{\pi D^2 C}{2} = 0$$

# Optimization Engineering Notes

**D Kirk**



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