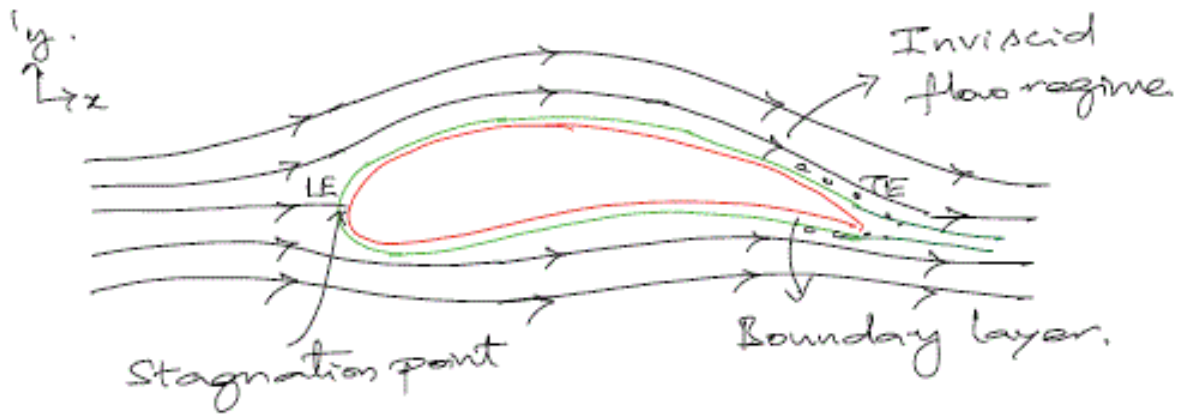




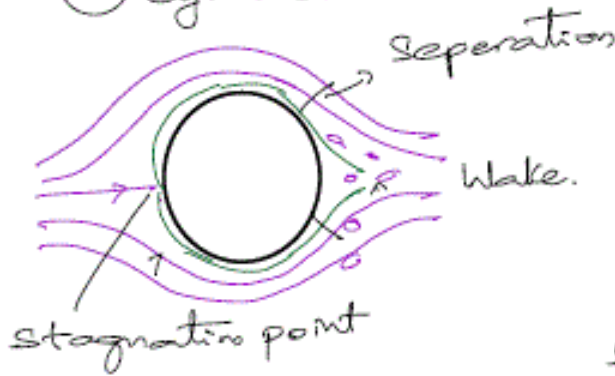
② External flow:

Flow over submerged bodies.

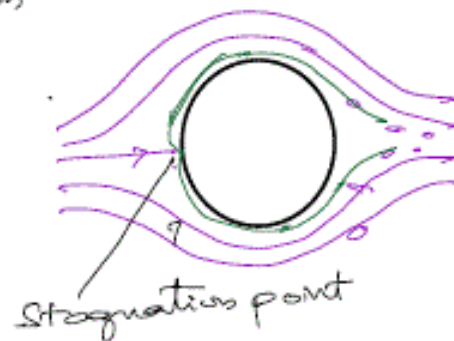
① Aerofoil [plate].



② Cylinder



③ Sphere



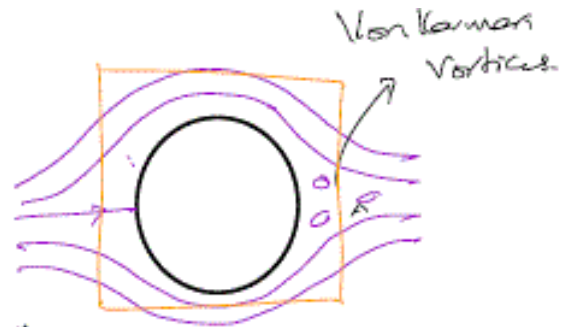


Flow over cylinder

$$A_s = \pi DL$$

$$Re_D = \frac{\rho V D}{\mu} = \frac{V D}{\nu}$$

$$C_D = \frac{F_D/A}{\frac{1}{2} \rho u_{\infty}^2} \rightarrow \text{Projected Area.}$$



Correlation from experimental data

$$C_D = 10.41 Re_D^{-0.6872} \rightarrow 0.1 < Re_D < 4$$

$$C_D = 5.67 Re_D^{-0.2511} \rightarrow 4 < Re_D < 1000$$

$$C_D = 1 \rightarrow 1000 < Re_D < 5000$$

$$C_D = 0.310 Re_D^{0.1525} \rightarrow 5000 < Re_D < 10^4$$

$$C_D = 1.14 \rightarrow 10^4 < Re_D < 2 \times 10^5$$