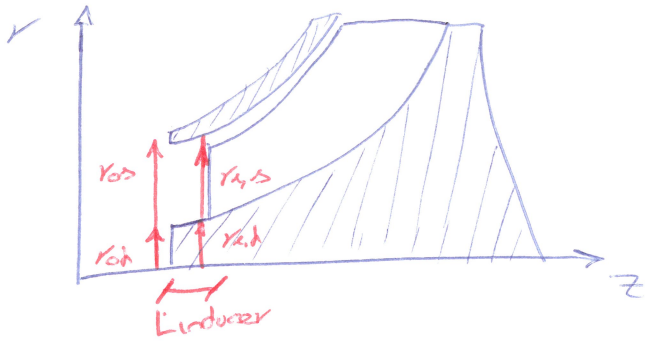
Impeller inducer geometry

There are 3 main types of inducer

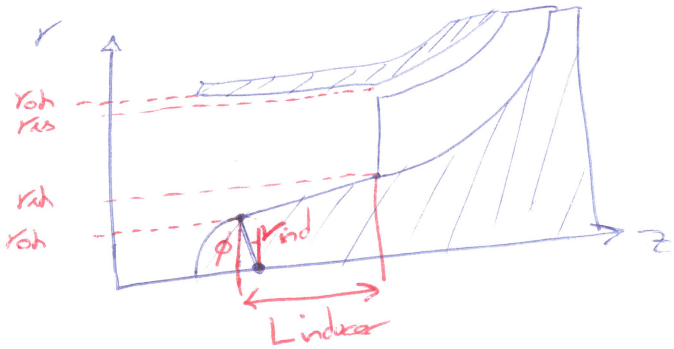
- Flat
- Circular arc
- Elliptic arc

Flat inducer



In this case the inducer is a truncated cone with a flat front face

Circular arc inducer



In this case the inducer is a truncated cone with an spherical front face

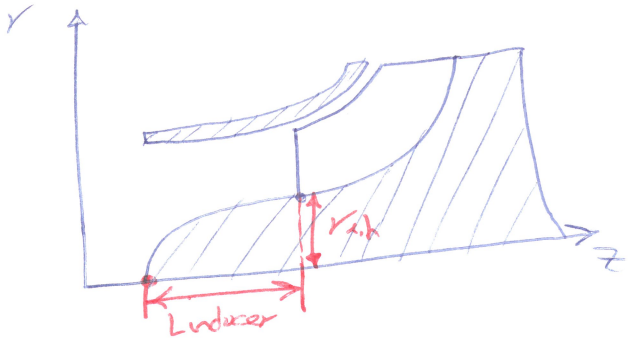
$$\tan(\phi) = \frac{r_{s,h} - r_{a,h}}{L_{inducer}}$$

$$R = r_{inducer} \cdot \cos\phi = r_{a,h}$$

$$\begin{cases} x = x_c + R\cos\theta \\ y = y_c + R\sin\theta \end{cases} \quad \text{where} \quad \begin{cases} x_c = -L_{inducer} + R\sin\phi \\ y_c = 0 \end{cases}$$

$$\theta \in \left[\pi/2 + \phi, \pi\right]$$

Elliptical arc inducer



In this case the inducer is an elliptical body and the front face is round

$$\begin{cases} x = x_0 + R_x \cdot \cos\theta = L_{inducer} \cdot \cos\theta \\ y = y_0 + R_y \sin\theta = r_{a,h} \cdot \sin\theta \end{cases}$$

with $\theta \in \left[\frac{\pi}{2}, \pi\right]$