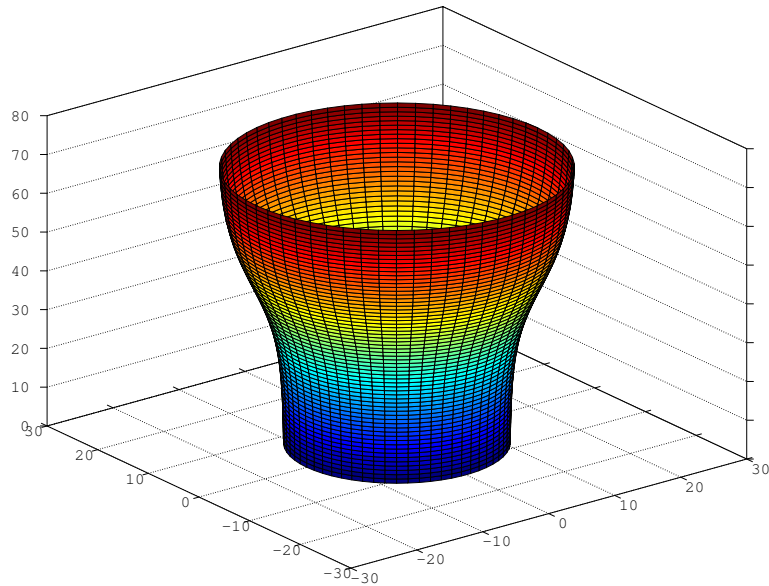


Tubeira sigmoidal



$$L = 70 \text{ mm}$$

$$h = 1.2 \text{ mm}$$

$$M = (40 - 24)/2 \text{ mm}$$

$$r = 0.15$$

$$y_0 = 0.05 \text{ mm}$$

$$x^* = -\frac{1}{r \cdot M} \ln\left(\frac{y_0}{M - y_0}\right) = 42.241 \text{ mm}$$

$$\begin{aligned} y(x) &= 1 + 24/2 + \frac{h}{2} + \frac{M}{1 + \exp[-r \cdot M(x - x^*)]} \\ &= 13.6 + \frac{8.0}{1 + \exp[-0.12(x - 42.241)]} \text{ mm} \end{aligned}$$

Legenda:

L comprimento

h espessura

M diferença de diâmetros