$$\vec{N} = -\frac{\omega}{v}(r_0 + v_0 t)\,\hat{e}_r + \frac{v_0}{v}\,\hat{e}_\theta$$

$$|\vec{N}| = \frac{\omega^2 (r_0 + v_0 t)^2 + v_0^2}{v^2} = 1 \quad \Rightarrow \quad \hat{N} = -\frac{\omega}{v}(r_0 + v_0 t)\,\hat{e}_r + \frac{v_0}{v}\,\hat{e}_\theta$$

$$\vec{a} = \dot{v}\,\hat{T} + \frac{v^2}{\rho}\hat{N} = -(r_0 + v_0 t)\,\omega^2 \hat{e}_r + 2 v_0 \omega\,\hat{e}_\theta$$

$$\dot{v} = \frac{1}{2}\,\frac{\omega^2 \cancel{2}(r_0 + v_0 t)\,v_0}{v} = \omega^2 \frac{v_0}{v}(r_0 + v_0 t)$$

$$\Rightarrow \quad \frac{v_0}{v}\,\omega^2 \frac{v_0}{v}(r_0 + v_0 t)\,\hat{e}_r + \frac{\omega}{v}(r_0 + v_0 t)\,\omega^2 \frac{v_0}{v}(r_0 + v_0 t)\,\hat{e}_\theta$$

$$+ \frac{v^2}{\rho}\left(-\frac{\omega}{v}\right)(r_0 + v_0 t)\,\hat{e}_r + \frac{v^2}{\rho}\frac{v_0}{v}\,\hat{e}_\theta = -(r_0 + v_0 t)\,\omega^2 \hat{e}_r + 2 v_0 \omega\,\hat{e}_\theta$$

$$\Rightarrow \begin{cases} \left(\frac{v_0 \cancel{\omega}}{v}\right)^2 \cancel{\omega (r_0 + v_0 t)} - \frac{\cancel{\omega} v}{\rho}\cancel{(r_0 + v_0 t)} = -\cancel{(r_0 + v_0 t)}\,\omega^{\cancel{2}} \\ \frac{\omega^3 \cancel{v_0}}{v^2}(r_0 + v_0 t)^2 + \frac{v \cancel{v_0}}{\rho} = 2\cancel{v_0}\,\omega \end{cases}$$

$$\Rightarrow \begin{cases} \rho = \dfrac{v}{\left(\frac{v_0}{v}\right)^2 \omega + \omega} = \dfrac{v^3}{\omega (v_0^2 + v^2)} = \dfrac{\left[\sqrt{v_0^2 + \omega^2 (r_0 + v_0 t)^2}\right]^3}{\omega\left(2 v_0^2 + \omega^2 (r_0 + v_0 t)^2\right)} \\ \rho = \dfrac{v}{\omega\left(\frac{\omega^2}{v^2}(r_0 + v_0 t)^2 + 2\right)} = \dfrac{v^3}{\omega(\cancel{-v^2} + v_0^2 + \cancel{2} v^2)} = + \dfrac{v^3}{\omega (v_0^2 + v^2)} \end{cases}$$

I due ρ sono uguali come <u>deve essere</u>.