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at R=R1:

$\sigma_t = Pi(R1^2+R2^2)/(R2^2-R1^2)$

$\sigma_r = - Pi$

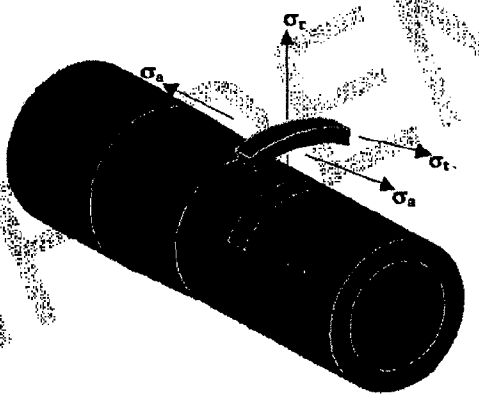
at R=R2:

$\sigma_t = 2R1^2Pi/(R2^2-R1^2)$

$\sigma_r = 0$

Stress State at OD

Two-dimensional stress state, Tangential (hoop - σ_t) stress plus Longitudinal (axial - σ_a) stress only.
Note: Radial stress = 0 at the outer surface.



The Maximum Principal Stress is therefore equal to the Tangential Stress(σ_t) and the Minimum Principal stress is equal to the Axial Stress(σ_a) at the OD.
The relationship between strain on the outer surface in these directions to stress is given by the equations:

$$\sigma_{Max} = E(\varepsilon_1+\mu\varepsilon_2)/(1-\mu^2) = \sigma_t$$

$$\sigma_{Min} = E(\varepsilon_2+\mu\varepsilon_1)/(1-\mu^2) = \sigma_a$$