where $\sigma_r$, $\sigma_\theta$, and $\sigma_z$ are the normal stresses acting in the radial, tangential, and axial directions, respectively, and $\tau_{rz}$ is the only non-vanishing component of shearing stress. The first two of these equations are not independent, in that they reduce to a statement of volume constancy when combined. Thus, only two equations are obtained from the flow law.

The von Mises yield criteria can be used to predict the incipience of plastic yielding in ductile metals. This theory is independent of the hydrostatic component of stress and requires the knowledge of a single material constant, the "effective stress" in uniaxial state of stress, in order to predict the behavior under any given combination of principal stresses. The applicable yield criteria is written as

$$(\sigma_r - \sigma_\theta)^2 + (\sigma_\theta - \sigma_z)^2 + (\sigma_z - \sigma_r)^2 + 6\tau_{rz}^2 = 2\bar{\sigma}^2 \quad (8)$$

where $\bar{\sigma}$ is the effective stress taken from a uniaxial compression test. The effective stress is assumed to be linear with respect to the effective strain as called for in the selection of the wafer material. Thus, the linear form of the Ludwig equation, Reference (n), becomes

$$\bar{\sigma} = \sigma_0 + b\bar{\epsilon} \quad (9)$$