$$\omega = -2z\,(2a_1 r^2 + a_2 z^2 + a_3) \qquad (30)$$

An examination of (29) indicates that the wafer can barrel in a parabolic fashion, having symmetry with respect to the mid-meridian wafer plane. Equation (30) shows that the wafer-anvil interface can likewise be deformed into a parabola; the line of symmetry being coincident with the wafer axis. It should be noted that no restriction has been placed on the wafer diameter-to-height ratio (D/H).

By taking the appropriate derivatives of the displacements, the strains are found to be

$$\epsilon_r = 3a_1 r^2 + 3a_2 z^2 + a_3 \qquad (31)$$

$$\epsilon_\theta = a_1 r^2 + 3a_2 z^2 + a_3 \qquad (32)$$

$$\epsilon_z = -4a_1 r^2 - 6a_2 z^2 - 2a_3 \qquad (33)$$

$$\gamma_{rz} = 2rz\,(3a_2 - 4a_1) \qquad (34)$$