

PURPOSE AND OBJECTIVES

The overall purpose of this analysis is to determine the state of stress existing within a short circular cylinder subjected to compressive loads by initially parallel plates, and to evaluate the effects of such parameters as; material strain-hardening, anvil (or plate) deflection, anvil-wafer surface shear, influence of an elastic radial confining ring, and the effect of the initial diameter-to-height ratio of the wafer.

The technical objectives are as follows:

1. To derive from the basic equations of plasticity, equilibrium, and continuity, a set of relations which will provide the state of stress in the wafer as a function of the above parameters, for a prescribed compressive load.
2. To design and develop an experimental system which is compatible with the mathematical model postulated in the analytical analysis.
3. To utilize results of the experimental system to obtain added verification of the predicted stress distributions within the wafer.