

Design Of A Pressure Test Fixture To Load The Soft Tissues of the Eye

Glaucoma is a disease of the eye that results in optic nerve damage due to elevated intraocular pressure. In order to properly model this disease, the material properties of the tissues of the eye must be determined. This can be accomplished a number of ways, including tensile tests of tissue strips. However, various questions arise with this technique. Inadequacies in tensile testing can be alleviated by using a spherical testing arrangement. This project involves the design and manufacture of a testing apparatus to apply pressure loading to spherically curved tissue samples, such as excised cornea, from various species. It is anticipated that components will include a watertight fixture into which dies of varying diameters can be placed to clamp the free edge of specimens of various diameters. The fixture will be connected to a water manometer to provide an internal fluid pressure simulating normal and elevated intraocular pressure. Preliminary testing will be performed to verify loading effectiveness. Chief experiences will include the engineering design process, use of CAD packages, and manufacturing oversight followed by performance evaluation.

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