DESIGN AND FABRICATE BIAXIAL LOADING FIXTURE
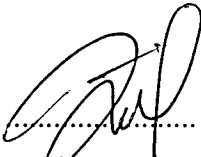
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"I declared that this thesis is result of my own work except the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree."

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ABSTRACT

Biaxial fixture is the devices that locate at universal tensile machine to study the materials strength properties. In this project, a fixture for the biaxial loading testing is design and analyze for using at the Universal testing Machine. The basic biaxial test can be used to measure basic material properties of the behavior with specific features of interest under biaxial loading conditions. The biaxial loading fixture must be in the suitable size that can be apply on the machine and can be expend into variable size according to the specimen that want to be tested. Firstly, stress analysis and exact as possible must be carried out. Without reliable stresses acting on a body, it is impossible to continue further analysis. An experimental method for precisely measuring the stress-strain distribution and predicting the material behavior under certain specialized service conditions has been developed using in-plane biaxial testing. The requirement for an ideal biaxial testing is that the stress and strain distribution in the gage area of the specimen therefore to fulfill this requirement, the fixture must always obey all the mechanical strength rule and properties. The results of testing such are important for the characterization of the material properties and the development of constitutive laws that can be used for predictive purposes. Therefore it clarifies the extent. Finally the analysis of biaxial fixture to which biaxial testing can be used for determining the elastic properties of these materials. Moreover, it is shown that certain assumptions underlying the analysis of planar biaxial tests are inconsistent with the classical linear theory.

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