THEORITICAL STUDY OF E-GLASS CONTINUOUS
ROVING/POLYESTER RESIN LAMINA
COMPOSITE TENSILE STRENGTH WITH MATLAB

Name Of Student : RACHMADI NORCAHYO
NRP : 2109 030 016
Department : D3 Teknik Mesin FTI – ITS
Consellor Lecturer : Ir. EDDY WIDIYONO, MSc.

Abstract

The needs of material who has some properties that fits with the purpose has pushed the development of material technology. one of the material is composite. Along with the development of technology of materials, the development of the technology of mechanical tensile strength testing is also grown. Where at this moment the mechanical strength test began to leaving the experimentally test and move to the theoretical testing.

In this study the composite are made with the combination of E-Glass Roving and Polyester resin and the composite form is lamina. The theoretical tensile strength test is using a matlab software.

From the research we known that matlab can be used as alternative for tensile strength test with lamina composite unidirectional fiber. And known that the volume fraction of fiber and matrik can influence the tensile strength of unidirectional composite lamina. The greatest Ultimate Tensile Strength can obtain with 60% polyester resin and 40% E-glass is 28,3816 Kgf/mm². Modulus elasticity is 599,933 Kgf/mm². and the shear modulus is 153,898 Kgf/mm² for the same composition. Greatest poisson’s ratio obtain from 20% E-glass and 80% polyester resin with 35,8899 Kgf/mm². And the change of angle fiber direction influence the tensile strength of unidirectional lamina composite. The biggest Modulus Elasticity, Ultimate Tensile Strength, and
Poisson’s Ratio obtain at 0° angle of fiber direction from all of volume fraction. And for biggest shear modulus obtain from 45° angle of fiber direction from all of volume fraction

Key Word : Composite, Tensile test, Matlab.t