

SUMMARY

Gilang Gumilar, Departement of Mechanical Engineering, Faculty of Engineering, University of Brawijaya, Mei 2016, *Effect of One Direction Pre-Tension on Tensile Strength and Impact Fibre-Powder Reinforcement Hybrid Composite*, Academic Supervisor: Tjuk Oerbandono and Bayu Satria Wardhana.

Composite is structural material consists of two or more combinations of material element that combined in macroscopic level. Nowadays composite material has common used in alternative material as a substitution for conventional material such as metal. However, the use of composite which is made from fiber using syntetic material in nowdays cause a lot of environmental problems. Therefore the utilization of natural material as composite material has begin to be developed. One of the example of natural resources that can be used for making the composite is coconut shell powder, it can be used for increase the *Impact's* strength in composite material. However the utilization of coconut shell powder also can decrease the *Impact's* strength.

This study was performed to determine the effect of one direction pre-tension on reinforcement hybrid composite to tensile strenght and *Impact* strength. The composite material was composed by the C-Glass fiber type woven roving, coconut shell powder and vinylester resin. C-glass fiber was given treatment while the forming of the material for reducing the stresses in the material composite. The methods for making the composite using the hand lay up method. The value of tension varience that used was 50N, 100N, 150N and 200N. The tensile test based on the reference standard ASTM D 3039 and for the *Impact* testing based on ASTM D 6110-04.

From the study, shows that giving the tension on reinforcement hybrid composite can increasing the tensile strenght and the *Impact* strenght of the material. Lowest tensile strength of the composite obtained in 0N treatment (without treatment) ranged in 71,58N/mm², and the highest tensile strength was obtained in the 200N pre-tension, ranged in 106.05 N/mm². And for the low *Impact* strength was obtained on specimens without treatment about 1,34J/mm² and giving the 200N pre-tension obtained the biggest *Impact* strength values, about 15,09J / mm²

Keywords: *composite, pre-tension, coconut shell powder, tensile strength, Impact strength*