UTILIZATION of NATURAL FIBERS (COCONUT FIBERS) AS AN ALTERNATIVE TO SYNTHETIC FIBERS IN THE FIBERGLASS TO GET THE OPTIMUM TENSILE STRENGTH

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Abstract

The largest issue of the world in the design and construction today is the limited natural resources and the environmental conservation. So, the effort to research and explore alternative materials that can cope with natural materials should remain preserved to never recede. The existence of prohibition the use of fiber plan within the next few years more research the growing manufacturing solutions environmentally friendly fiber. In fact, certainly fiber is not lost use in various applications, especially in the marine sector. For small boats and ferry services made possible to develop this fiber, so that the use of timber ships logging impact can be avoided. To avoided the effects of this environment should be made of alternative materials for applications natural fibre composites environmentally friendly course. In addition to environmentally friendly fiber composites, also confirmed other benefits, where the constituent fiber composite good nature, it can optimize the strength of fiberglass. Not less important reason this research is conducted, the main natural fibers used in this research is coconut fibers and Indonesia is the country’s largest coconut producing of coconut plants in the
world. Therefore, coconut fibers called as the waste can be a high economic value. This research laboratory test consists the tensile and bending test. The test object consisting of two layers of fiber sheets that are namely woven design and straw design, which comes from coconut fiber and straw stalks of plants. Tensile and bending tests in this experiment is done by testing seven times. Based the calculation of test data, it is known that the highest tensile strength is design of woven coconut fiber, which is 40.43 MPa, while the lowest is the design of woven straw with 30.37 MPa. For the bending test, the best design is the straw fiber loops, which is 25.97 MPa, while the fiber with lowest strength is combination of coconut fibers and woven fibers woven straw matting, which is 17.22 MPa. From the analysis of this research, coconut fiber and straw fiber loops could be used as an alternative to synthetic fibers in the fiberglass, because it can increase the tensile strength and bending, compared with pure polyester strength that only 13.25 MPa for tensile test 17.45 MPa for bending test. However, when used as a ship's hull, natural fiber in this research was still not sufficient BKI standards, 100 MPa tensile test and bending test of 150 MPa, so that more research should be done with a special enactment. So, research of natural fibers and fiber can be applied to various marine sector, which do not require high strength as an alternative material.

Keywords: Environmental Issue, Alternative, Natural and Synthetic Fibers, Fiberglass Applications.