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FLEXURAL TEST IN POLYESTER MATRIX COMPOSITES REINFORCED WITH HEMP FIBER

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The use of the synthetic fibers has been gradually replaced by natural fibers. Some reasons are that in comparison with synthetic fibers, the natural ones. Natural fiber has shown economic and environmental advantages. The material used in this present work was the untreated hemp fiber and polyester resin. These hemp fibers were extracted from the stem of the hemp plant and it's important to mention that this is one of the natural fibers with least knowledge as far as mechanical properties are concerned. Initially, one hundred fibers were taken out from the bundle for a statistical evaluation of diameter. Composites specimens with amounts from 0% to 30% in volume fraction of fibers were fabricated by mixing the percentage of fibers with fluid polyester added hardener MEK. The specimens were cured at room temperature for 24 hours, after that, they were cut following the ASTM standard. These specimens, for each amount of fibers were three points bend tested. Polyester matrix composites reinforced with aligned hemp fibers show an improvement in the strength as compared to the pure polyester matrix, polyester matrix with less than 10% the addition of hemp fiber is brittle and the crack propagates without being arrested until the separation of the specimens. Better results can be achieved with higher volume of hemp fiber added in matrix because this considered amount of incorporated fibers blocks the initial propagating crack and the rupture migrates to fiber/matrix interface.