The Development of Recyclable Wind Turbine Blades Using Autodesk 3D Simulations

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Today’s wind turbine blades are very difficult and expensive to recycle. After they are decommissioned wind turbine blades are put in landfills where the materials mix with the soil and groundwater causing pollution. The purpose of this experiment is to determine which material is the best recyclable substitute for fiberglass in wind turbine blades. The goal of this experiment was to design a one hundred percent recyclable wind turbine blade. Based on research it was determined that the best recyclable substitute for the CFRP, Carbon Fiber Reinforced Polymer, resin and epoxy was Elium Thermoplastic Resin and Graphene Epoxy. A list of five materials to replace the fiberglass was then created. The structural integrity of these materials was tested using a 3D model on Autodesk Inventor Professional. The properties of the materials were then analyzed to determine which would be the lightest, strongest, most durable, and most recyclable. After performing the stress analysis and researching the weight, strength, and durability of the materials; it was determined that the best material was bamboo. A blade made of Elium Thermoplastic Resin, Graphene Epoxy, and bamboo would be the best choice for a recyclable wind turbine blade

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