

Analysis of the effects of materials on the resistance of the flywheel

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ABSTRACT

Wind generators are generators whose primary source of energy is wind. It is well known that this source has very fluctuating and unpredictable characteristics so it is impossible to predict its value for a given moment. This poses many problems for energy system managers in stabilizing electricity production, especially for sites not connected to the electricity grid.

We chose the electromechanical storage system that can provide a solution to solve the problem of fluctuating wind energy due to sudden changes in wind speed.

The objective of this work is to study the inertial energy storage system (SISE) associated with a wind generator that balances the demand and supply of electric power to stabilize the electricity grid.

In this work, we chose a material with a low density and the highest breaking strength possible. We also chose a hollow cylinder as an appropriate geometric shape in order to increase the energy capacity of the SISE and its efficiency.

In order to model our structure, we used the ABAQUS CAE software to adapt the finite element methodology; we made a comparison between three steering wheel technologies: Carbon fiber R steering wheel, Kevlar steering wheel and R glass flywheel, and thus applying a pressure force and assess their deformability.

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