

Assessment of kinetic energy storage band volume energy consumption

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Abstract

© Research India Publications. Some estimates of the flywheel energy storage band volume energy consumption with various form of rotor part design are given in the work. In addition to a traditional assessment of volume energy consumption on kinetic energy, the assessment on the possible saved-up specific potential energy of elastic deformations is added. The analysis of various constructional materials use possibility, in particular metals, elasto-plastics and coal plastics, is carried out at the rotating part manufacture of kinetic energy storage band, influence of flywheel rotor part form on volume energy consumption is investigated. Terminating formulas for volume energy consumption of various form flywheels, where such characteristics of material as density, elastic modulus, Poisson's ratio and temporary material tensile strength are received. The received ratios analysis is carried out and types of materials, optimum for flywheel projection are defined. Flywheel material placement possibilities are analyzed at various distance concerning its spin axis depending on its mechanical characteristics. It is noted that the assessment of power consumption used in work both on kinetic and on potential energy expands variability when constructing kinetic energy storage band and in some cases allows to reduce the speed of design rotor part rotation.

Keywords

Flywheel, Kinetic and potential energy, Volume energy consumption