
Design and modeling of a single-stage conical reducer

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Abstract

The main role of the reducer is to adapt the power and movement parameters of the drive machine to the needs of the working machine (nominal power, nominal torque, number of revolutions, angular velocity). In modern engineering practice, the use of reducers is very intensive. In case when the shafts of driving and working machines intersect at an angle (most often at an angle of 90°), conical reducers are used.

In this paper, the calculation, design and production of a specific single-stage conical reducer was carried out. The three-dimensional model is created in Autodesk Inventor software. The basic elements (shafts, gears,...) were made using the 3D printing method at the Center for Testing and Calculation of Machine Elements and Systems „Prof. Dr Vera Nikolić Stanojević“, while the housing was made using wooden materials. The created functional model can be used for the education of future mechanical engineers.

The created functional model of a single-stage conical reducer is primarily intended for the education process of young high school students and engineers. The goal is to familiarize students with the basic machine elements for power and motion transmitting by the created model for the case when the axes of the input and output shafts intersect at an angle of 90°. Also, the created single-stage conical reducer can be used as a functional model in the case of smaller loads.