

Research of gear drives

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Abstract

Worm gear drives possess important advantages such as: compact design, high power density due to a high gear ratio within a single gear stage. However, these gear drives often show high sliding speeds within the tooth contact, resulting in relative low efficiency coefficient in the meshing. Therefore, an exact calculation regarding efficiency in the meshing and load capacity is important during the beginning stage of the machine design process. Currently, no calculation method is available to analyze worm gears considering efficiency in meshing and contact strength. The objective of the research implemented was to analyze extensively the meshing efficiency and the contact stress behavior of various geometry designs of worm gears drives. Optimization research has been implemented considering the criteria mentioned. All calculations and theoretical analysis have been implemented for different center distances, different modules, gear ratios and rotational speeds of the worm shaft. Simulation results are shown and discussed. Important conclusions and recommendations are suggested.

Keywords: worm gear drives, sliding

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