

6th International Conference and Exhibition on

Mechanical & Aerospace Engineering

November 07-08, 2018 | Atlanta, USA

Compact design of high contact ratio gears

Tuan Nguyen

University of Memphis, USA

This study presents a computer simulation for the dynamic design of compact high contact ratio spur gear transmissions. High contact ratio gears have the potential to produce lower dynamic tooth loads and minimum root stress but they can be sensitive to tooth profile errors. The analysis presented in this work was performed by using the NASA gear dynamics code DANST (Dynamic Analysis of Spur Gear Transmissions). In the analysis, the addendum ratio (addendum/diametral pitch) was varied over the range of 1.30 to 1.40 to obtain a contact ratio of 2.00 or higher. The constraints of bending stress limit and involute interference provide the main criteria for this investigation. The compact design of high contact ratio gears with different gear ratios and pressure angles was investigated. Comparison of compact design between low-contact-ratio and high-contact-ratio gears was conducted. With the same operating parameters, high contact ratio gears appear to have much more compact design than low contact ratio gears. For the compact design of high contact ratio gears, a diametral pitch of 6.00 appears to be the best choice for an optimal gear set.

tnguyenphd@yahoo.com

Notes: