

## **Worm Gearing Design Improvement by Considering Varying Mesh Stiffness**

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**Abstract :** A new approach has been developed to estimate the load share and stress distribution of worm gear sets. The approach is based upon considering the instantaneous tooth meshing stiffness where the worm gear drive was modelled as a series of spur gear slices, and each slice was analyzed separately using the well established formulae of spur gears. By combining the results obtained for all slices, the entire involute worm gear set loading and stressing was obtained. The geometric modelling method presented, allows tooth elastic deformation and tooth root stresses of worm gear drives under different load conditions to be investigated. On the basis of the method introduced in this study, the instantaneous meshing stiffness and load share were obtained. In comparison with existing methods, this approach has both good analysis accuracy and less computing time.

**Keywords :** gear, load/stress distribution, worm, wheel, tooth stiffness, contact line

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