修整於螺旋齒輪對動態特性影響之研究

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摘要

Based on the derived involute gear profile equations generated by a rack cutter, at first this study constructs high quality elements of helical gears in which the node density and distribution of gear finite element (FE) models can be adjusted parametrically and automatically. Then, the dynamic contact stresses and fillet stresses of operating helical gear pairs including the tooth modifications are calculated using a dynamic FE package LS-DYNA. Accordingly, the influences of the addendum and crowning modifications on the dynamic stresses in the helical gear pairs with or without the assembly errors are investigated. The analyzed results show that suitable addendum modifications and crowning modifications can reduce the maximum values of dynamic stresses for the helical gear pairs with assembly errors or not. Especially, the applying measure which both the addendum and crowning modifications are performed can more improve the dynamic characteristics of helical gear pairs.

關鍵字：Helical gear, Gear modification, Assembly error, Dynamics, FEM