

Pressure Angle and Profile Shift Factor Effects on the Natural Frequency of Spur Tooth Design

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Abstract : In this paper, an (irregular) case relating to base circle, root circle, and pressure angle has been discussed and a computer programme has been developed to simulate and plot spur gear tooth profile, including involute and trochoid curves based on the formulation of rack cutter using different values of pressure angle and profile shift factor and it gave the values of all important geometric parameters. The results showed the flexibility of this approach and versatility of the programme to draw many different cases of spur gear teeth of any module, pressure angle, profile shift factor, number of teeth and rack cutter tip radius. The procedure developed can be extended to produce finite element models of heretofore intractable geometrical forms, to exploring fabrication of nonstandard tooth forms also. Finite elements model of these irregular cases have been built using above programme, and modal analysis has been done using ANSYS software, and natural frequencies of these selected cases have been obtained and discussed.

Keywords : involute, trochoid, pressure angle, profile shift factor, natural frequency

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