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Improvement researches on involute tooth profile

Jikai Fan [1, a], Youmin Hu [1, 2, b], Yanlei Li [1, c], Xiong Jing [1, d], Xiaokun Duan [1, e]

[1]State Key Laboratory of Digital Manufacturing Equipment and Technology, Huazhong University of Science and Technology, Wuhan, Hubei, China, 430074
[2]Wuxi institute, Huazhong University of Science and Technology, Wuxi, Jiangsu, China, 214174
[a]email:fan_ji_kai@163.com
[b]email:youmhwh@mail.hust.edu.cn
[c]emial:liyanlei90@163.com
[d]email:xjt513-1-34m@163.com,
[e]dxk2153@hust.edu.cn

Abstract

A kind of profile modification cubic curve of the involute spur gear is proposed in this paper using the geometric theory and the Curve fitting method. The derivation process of the key point coordinates and the curve equation is described in detail, the proposed modification curve tangents to both the involutes and the addendum circle. Using the modification curve to correct the flank shape of the driving and driven gears, the smooth transition between the cubic curve and involute can be ensured, as well as between the cubic curve and the addendum circle. Besides, the contact stress reduces obviously after modification using this method which can be verified with Hertz contact theory, finally, an example is adopted to illustrate how to implement this modification method. The goal of this article is to put forward a scheme for the optimization design and improvement of gears so as to improve the gears' working condition and prolong their service life.

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