

机械科学

切入磨削与纵向磨削的磨削力分析与比较

李厦;李郝林

上海理工大学,上海,200093

摘要:

研究了同时包含切入磨削和纵向磨削的复杂外圆磨削过程。根据纵向磨削过程的特点,将砂轮等效成若干个小砂轮,在传统阶梯模型的基础上构建了砂轮磨损的抛物线模型。推导了基于两种模型的纵向磨削切向分力和切入磨削切向分力的比较公式,两切向分力的比值反映了切入磨削和纵向磨削转换时切向分力的变化情况,它主要与磨削系数、砂轮宽度和纵向进给速度有关。采用砂轮主轴功率信号分析磨削切向分力,通过实验验证了抛物线模型更符合实际情况的结论。研究结果为采用磨削力信号和功率信号研究复杂磨削过程的监控提供了参考依据。

关键词:

切入磨削 纵向磨削 磨削力 功率信号

Analysis and Comparison of Grinding Forces between Plunge Grinding and Traverse Grinding

Li Sha;Li Haolin

University of Shanghai for Science and Technology, Shanghai, 200093

Abstract:

Complex cylindrical grinding processes including both plunge grinding and traverse grinding were investigated. According to the traverse grinding characteristics, the grinding wheel was equivalent to a number of small wheels,a parabolic model for wheel wear was built based on the traditional steps model. The comparision formula of tangential grinding force was derived based on two tangential grinding forces of plunge grinding and traverse grinding the ratio of the tangential grinding force reflected tangential grinding varieties from the plunge grinding to the traverse grinding and was concerned with grinding coefficient, the wheel width and the traverse feed rate. The tangential grinding force was analyzed by the grinding wheel spindle power signals in experiments and the parabolic model is more realistic.Using force signals and power signals to monitor the complex grinding processes provides a reference method.

Keywords: plunge grinding traverse grinding grinding force power signal

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2. 王续跃;徐云飞;徐文骥;王连吉;康仁科;郭东明.辅助侧向吹气法金刚石砂轮激光修锐试验与评价[J]. 中国机械工程, 2008,19(6): 0-750
3. 闫艳燕;栗成杰;赵波;马辉;.二维超声磨削纳米氧化锆陶瓷的磨削力特性研究 [J]. 中国机械工程, 2008,19(11): 0-1312
4. 盛晓敏;唐昆;宓海青;余剑武;陈涛;.TC4钛合金高效深磨磨削力及比磨削能特征研究 [J]. 中国机械工程,

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2009,20(01): 0-19

5. 王君明;汤漾平;宾鸿赞;冯清秀;熊正鹏;.55钢平面磨削中未变形磨屑厚度及单位磨削力的研究[J]. 中国机械工程, 2009,20(10): 0-1154

6. 黄辉, 林思煌, 徐西鹏.

单颗金刚石磨粒磨削玻璃的磨削力研究

[J]. 中国机械工程, 2010,21(11): 1278-1282

7. 詹友基, 李远, 黄辉, 徐西鹏.

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[J]. 中国机械工程, 2010,21(15): 1844-1849

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