

材料工程

圆柱斜齿轮浮动凹模冷挤压成形仿真与实验研究

薛克敏;李晓冬;李萍;许锋;周结魁;石文超

合肥工业大学,合肥,230009

摘要:

采用浮动凹模冷挤压成形工艺,对螺旋角不同的同一型号圆柱斜齿轮进行了数值模拟与实验研究。分析了成形过程中金属的流动特点、成形载荷,并与传统工艺进行了比较。通过不同螺旋角斜齿轮的对比,探索了影响脱模后锻件精度的因素。结果表明:对圆柱斜齿轮采用浮动凹模冷挤压成形可有效降低成形载荷,且在脱模过程中齿轮锻件沿着齿形螺旋方向做刚性旋转运动,脱模后锻件可保持较高精度。研究成果为圆柱斜齿轮精锻成形工艺的深入研究提供了参考。

关键词:

圆柱斜齿轮 浮动凹模 脱模 刚性旋转

Simulation and Experimental Research on Floating Die Cold Forming of Helical Gears

Xue Kemin;Li Xiaodong;Li Ping;Xu Feng;Zhou Jiekui;Shi Wenchao

Hefei University of Technology,Hefei,230009

Abstract:

By cold forging process with floating die,the same type helical gears with different helix angels were researched by both numerical simulation and physical experiments.Characteristics of metal flowing and forming load were analyzed and compared with the conventional scheme.Factors that affected the precision of forgings after demoulding were discovered by comparison of helical gears with different helixs.

The results show that the cold forming load of floating die can be reduced effectively,and when demoulding,the helical gears make rigid rotation along the helical directions.The paper provides a reference for the further research of helical gear precision forging.

Keywords: helical gear;floating die;demoulding;rigid rotation" href="#"> helical gear;floating die;demoulding;rigid rotation

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作者简介:

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