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开槽仿形磁极在轴承内圈滚道光整中的应用

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摘要: 为解决轴承内圈滚道表面抛光困难及研磨不均匀的问题,选用了开槽仿形磁极对轴承内圈滚道表面进行光整加工。采用Ansys Maxwell对比分析了开槽仿形磁极和仿形磁极的磁场分布,选用控制变量法探讨了各试验参数对轴承表面光整加工的影响。结果表明,在磁性研磨粒子粒径为185 μm,轴承与磁极间隙为2 mm,工件转速为1200 r/min的条件下,加工时间40 min,表面粗糙度由1.35 μm下降为0.13 μm,表面缺陷得到有效去除。

关键词: 开槽仿形磁极;表面粗糙度;磁力研磨;表面形貌
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Application of Slotted Profiling Magnetic Pole in Bearing Inner Ring Groove Finishing

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Abstract: In order to solve the problem of difficult polishing and uneven grinding of the inner ring raceway surface of the bearing, slotted profiling magnetic pole is selected to finish the inner ring raceway surface of the bearing. The magnetic field distribution of the slotted profiling magnetic pole and the profiling magnetic pole was analyzed by Ansys Maxwell and the influence of test parameters on bearing surface finishing was discussed by control variable method. The results show that when the particle size of the magnetic abrasive grains is 185 μm, the distance between the bearing and the magnetic pole is 2 mm, the workpiece rotation speed is 1200 r/min and the processing time is 40 min, the bearing surface roughness could reduce from 1.35 μm to 0.13 μm. Surface defects can be removed effectively.

Keywords: slotted profiling magnetic pole; surface roughness; magnetic grinding; surface morphology

随着机械工艺技术的持续发展,行业对产品的质量要求在逐步提高,因此如何使零件得到更好的的表面质量,强化零件的使用性能,延长零件的服役寿命是必须彻底解决的关键问题。轴承内圈滚道表面质量的好坏,对轴承承受载荷的大小起着至关重要的作用。在实际的工作过程中,滚动体在具有凹陷、凸起、裂纹等缺陷的粗糙的内圈滚道表面上滚动,会增大滚道与滚动体的摩擦力,容易产生

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