吉林大学学报(工学版) 2007 37 (05): 1064-1068 ISSN: 1671-5497 CN: 22-1341/T

凸轮材料的表面强化及其摩擦学特性

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收稿日期 2006-9-22 修回日期 网络版发布日期 2007-8-27 接受日期

摘要 研究了汽车用铁基烧结凸轮材料在3种表面处理状态下（烧结态、激光表面淬火和高频感应淬火）的显微组织、显微硬度及其摩擦学特性。研究结果表明：经2种表面淬火后，材料的表面得到一均匀的硬化层，其组织为细针状的马氏体组织，材料表面的耐磨性和摩擦系数得到了显著的改善。激光淬火凸轮材料的表面摩擦学特性略优于高频淬火凸轮材料。在本试验参数范围内，随着试验载荷的提高，激光淬火铁基烧结凸轮材料的磨损机制发生转变，由轻微氧化磨损和磨粒磨损机制转化为严重氧化磨损、磨粒磨损和剥层磨损机制。

关键词 材料表面与界面,粉末冶金,凸轮材料,表面强化,摩擦学特性

分类号 TG156.3

Surface hardening and tribological properties of a cam materials

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Abstract Microstructure, microhardness and tribological properties of ferrous P/M cam materials for automobile applications were investigated under three conditions (as sintered, high frequency induction quenched and wide band laser surface quenched). The experiment results indicate that a hardened layer is obtained on the surface of the materials after two kinds of surface hardening. Microstructure of the hardened layer is fine spiculate martensite which can help to improve the wear and friction properties of the materials. The tribological properties of laser surface quenched cam materials are slightly better than high frequency induction quenched cam materials. With the increasing of the applied load the wear mechanism of laser quenched cam materials changes from mild oxidation wear and abrasive to severe oxidation wear, abrasive wear and delamination wear.

Key words surface and interface of materials P/M cam materials surface quenched tribological properties

DOI:

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