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“金属布”硬质复合涂层的微观组织及性能^①

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摘要: 用X射线衍射仪、扫描电镜、摩擦磨损试验等,研究了粉末冶金“金属布”,及其钢表面改性技术在钢表面制备的WC-Ni系合金复合涂层的微观组织和性能。结果表明:该合金涂层中硬质相的体积含量可大于60%;涂层的微观组织有两类:一种是在粘结相中均匀分布的碳化物与弥散分布的球状粘结相富集区构成的非均匀结构;另一种是碳化物和粘结相都均匀分布的均匀结构。碳化物分布区的硬度大于Hv1076,粘结相富集区的硬度在Hv967-Hv458之间。涂层与钢基体之间有几~几十微米的界面过渡区,形成剪切结合强度大于400 MPa的冶金结合。复合涂层的耐磨性明显优于调质T8工具钢。

关键字: 复合涂层 微观组织 性能

MICROSTRUCTURE AND PROPERTIES OF "POWDERED ALLOY SHEET" HARD COATING

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Abstract: The microstructure and properties of WC-Ni alloy composite coating manufactured by "Powdered Alloy Sheet" and corresponding steel surface hardening technology were studied by XRD, SEM, wear-resistance or abrasion resistance test etc. It is found that the volume percentage of hard phase can be more than 60% in the cladding material. Two type microstructures exist in the surface coating: one is that tungsten carbides homogeneously distributed in nickel alloy binder mix with dispersal spherical binder-rich zone to form unhomogeneous microstructure; the other is that both carbide and binder are mixed homogeneously to form homogeneous microstructure. The hardness for carbide distribution zone is more than Hv 1076; while for binder-rich zone the hardness is between Hv 458~Hv 967. There is an interface region between surface alloy layer and steel matrix to form metallurgical combination. The shear bonding strength is over 400 MPa. The wear resistance of coating is obviously higher than quenching-tempering T8 tool steel(HRC55).

Key words: microstructure propertiiies powdered alloy sheet WC-Ni alloy composite coating

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