

论文

Al-Si合金等离子涂层Ni-Cr-B-Si的激光重熔

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摘要: 利用5kWCO₂激光器重熔Al-Si合金表面的Ni-Cr-B-Si等离子喷涂层.SEM和TEM分析结果表明, 激光熔层内晶化区和非晶化区共存, 在后续熔区的传热作用和周围结晶潜热作用下, 有部分非晶晶化为Ni₃Al纳米晶(2—5nm), 其中一些逐渐长大成为细小的粒状晶. 未晶化区硬度极高(HV=1235), 是原等离子喷涂层硬度的4倍。

关键词: 激光表面熔化 Al-Si合金 非晶 纳米晶

LASER REMELTED Ni-Cr-B-Si COATING ON Al-Si ALLOY

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Abstract: The plasma sprayed coating zone (Ni-Cr-B-Si) on an Al-Si alloy surface was remelted by a 5 kW CO₂ laser. SEM and TEM analysis showed that there is crystalline and amorphous coexistent region. As the annealing effects caused by heat transfer of following melt and latent heat of crystallizing, some Ni₃Al nano-crystallites (2-5 nm) formed and some of them grew gradually into globular grains (0. 1-0.2μm). The hardness in amorphous region is up to HV 1235 which is 3 times as high as that of plasma sprayed coating zone.

Keywords: laser surface melting aluminium alloy amorphous nanocrystal

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