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# Microstructure and corrosion behavior of Fe-Based Amorphous coating prepared by HVOF

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## Abstract:

Amorphous coatings were deposited by High Velocity Oxygen Fuel (HVOF) spraying using Fe-based amorphous powder for pitting corrosion resistance. The microstructure and phase component of coatings were characterized by XRD, SEM and TEM. It was found that although the temperature of supersonic flame was much high than the crystallization temperature of amorphous powder, a coating constituted of nearly amorphous phase and nanocrystalline phase was prepared efficiently. In the process of nanocrystalline formation, the Fe element was observed depleted while Cr element was enriched. The pitting corrosion resistance of the coating was investigated in 3.5wt% NaCl aqueous electrolytes using electrochemical cyclic-anodic-polarization measurements. The results showed the pitting potential ( $E_{pit}$ ) and pitting protection potential ( $E_{pp}$ ) of Fe-base amorphous coating were obviously high than that of stainless steel and thermal spraying WC coating, implying pitting corrosion resistance of parts served in marine environment can be improved by Fe-base amorphous coating.

**Keywords:** Amorphous coating; HVOF; pitting corrosion

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