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The application of transmission electron microscopy to the analysis of powder coatings deposited on metal substrates by plasma method(Article)(Открытый доступ)

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This paper presents the experimental techniques of transmission electron microscopy of plasma-spray powder alloy coatings. It includes the specimen preparation techniques for powder materials and for plasma spray powder coatings from the nickel-chromium-based alloy and synthetic hydroxyapatite (HA) and the analysis of the results. The study of the structure-phase compositions of HA powders and HA and Ni-Cr-based plasma spray coatings has been carried out by using transmission electron microscopy on JEM-2100 (JEOL), and by X-ray diffraction (XRD) on X'Pert PRO diffractometer (PANalytical, the Netherlands). It has been established that the coatings have the desired structure-phase composition as a result of the selection of specific modes of plasma spraying and additional plasma treatment. The advantages and challenges of application of TEM method for analyzing the structure of thick (up to 300 μm) powder coatings deposited by plasma spraying methods onto metal substrates are investigated. 