Coatings

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Additively Manufactured Coatings

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Functional coatings are cost-effective means to protect substrates from wear, corrosion, erosion, tribocorrosion, high temperature and high pressure in extreme environmental conditions. These are primarily manufactured through metal/ceramic powder deposition in a subsequent layer by layer fashion on the substrate materials. In all cases, the functional coatings need to be reliable for the intended application. The emerging techniques in 3D printing/additive manufacturing can be utilized to develop high-performance functional coatings. These methods provide geometrical precision, flexibility in geometrical complexity, customization of the coating layers, and reduce the raw materials waste, keeping the manufacturing cost low while addressing many of the technical barriers of conventional coating methods. With the rapid development of cutting-edge value-added technologies in aerospace, nuclear, military, space, and energy industry, 3D printing/additive manufacturing techniques will be major advantages. Novel functional coatings and 3D printing/additive manufacturing techniques will be critical to value-added components in the future development of technologies. The book provide an overview of the recent development in coating manufacturing techniques and potential to use in high-end engineering applications.

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