Special Issue

Advanced Coatings in Additive Manufacturing

Message from the Guest Editors

Advanced coatings in additive manufacturing are multi-functional surface treatment layers formed by layer-by-layer deposition through 3D printing technology. They are mainly divided into three categories: metal-based, ceramic-based, and composite coatings. Current research focuses on: 1) the grain boundary strengthening effect of nanostructured coatings (such as nano-Al2O3 coatings with a hardness of up to 25 GPa);2) the development of intelligent responsive coatings (such as temperature-sensitive shape memory coatings);3) multi-material gradient co-deposition technology;4) a process parameter optimization system based on machine learning. According to relevant predictions, by 2030, 30% of protective coatings worldwide will adopt additive manufacturing processes, especially in nuclear power component repair (with an estimated market size of USD 5.8 billion) and the battery cooling coating of new energy vehicles, which have potential for explosive growth. Advanced coating technology in additive manufacturing is driving the intelligent transformation of the manufacturing industry, and thus has very broad research and application prospects.

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Message from the Editorial Board

Now more than ever, research is asked to deliver knowledge and technologies to solve the major challenges faced by our society. The development of new materials and devices for (without the ambition to be exhaustive) energy, health and food technology, together with the need for establishing processes that reduce the impact on critical resources and the environment, is indeed in the spotlight of most contemporary research. Surface science and engineering play a key role in this regard, with an incredible potential in delivering new and deep scientific understanding and technical solutions essential to solve most of the major societal challenges.
Coatings is a well-established, peerreviewed, online journal dedicated to the vibrant field of surface science and engineering. Coatings publishes original research articles that report cutting-edge results and review papers that make the point on the hottest research topics.

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