Special Issue

Application of Electron Beam Additive Manufacturing Process in Metal Alloys

Message from the Guest Editors

Electron beam additive manufacturing has reached a point in development where engineers and scientists can design materials and develop applications, beyond the classic determination of which alloys we can obtain with AM, or obtaining simple shapes like cubes. Examples of current trends for innovative applications include modifications of composition throughout a build (e.g., gradient materials, layered materials), intricate geometries (e.g., lattices, organic-inspired designs), creation of intermetallics and second phases (either desired or deleterious), creative ways to obtain alloys that were not printable in the past, and others. The realization of these advances depends upon a detailed understanding of the fundamentals of composition–process–microstructure–property relationships, and the fundamental work that underpins such an understanding. This Special Issue is focused on publishing high-quality research of innovative applications of additive manufacturing of metal alloys using an electron beam as a heat source, covering aspects such as the process, geometries, compositions, microstructure, modeling, or testing of properties.

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Message from the Editorial Board

Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

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