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Challenges in Additive Manufacturing of Metals and Their Alloys: Microstructure and Mechanical Properties

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Deadline for manuscript
submissions:

closed (10 December 2023)

Message from the Guest Editor

Dear Colleagues,

The development of additive manufacturing methods has now reached the re-evaluation stage, with many problems and challenges facing R&D, especially during the pandemic period when all activities were ceased. These problems relate to increasing the production rate and final product sizes, obtaining high-quality, fully dense metallic components, avoiding the inconsistency of the components printed, developing efficient post-processing methods, optimizing the source materials and rheology of the powder blends, providing the compatibility of alloy structures when growing multi-materials, and many others.

Direct energy wire-feed deposition methods allow fabricating large and fully dense components while powder-bed ones ensure higher accuracy and more complex shapes. Other methods are effective that utilize powder metallurgy approaches, including printing green samples and then sintering them.

In the post-pandemic period, more effort should be put into developing the most promising solutions for each type of final product and the standardization of digital manufacturing.





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Message from the Editor-in-Chief

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