Special Issue

Trends and Innovations in Advanced Energy Source Power Bed Fusion

Message from the Guest Editor

Some analyses foresee an AM market growth at a CAGR of 20% in the next five years. At the same time, new energy sources and new manufacturing solutions appear to provide possibly more suitable solutions concerning laser- and electron-beam PBF, as well as in terms of plug-in efficiency, such as microwave, electrochemical, high chamber pressure, and a reactive atmosphere. However, some critical aspects have fewer literature data than the application case studies. Among the critical aspects, the instability of the molten section (Rayleigh instability), the diffusion process in the pool (Marangoni flow), and the vapor pressure effects on selective de-alloying may determine the future technology's natural application field. This editorial initiative focuses on critical aspects of, and advanced solutions to, additive construction, based on scientific approaches and free from the fideistic attitudes that too often accompany this technology and distract from a rigorous approach.

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