

## Additive manufacturing: A breakthrough technology for manufacturing

Additive manufacturing (AM) is on its way to become the next industrial revolution. The growing interest on the subject has undoubtedly attracted many scientists in diverse areas of expertise. This attractively is justified by the large degree of freedom allowed by these technologies to design features of unequalled level of complexity with limited dependence on tooling. This work will briefly introduce the types of AM technologies available today. It will also address the new trends in additive manufacturing, manufacturing concepts, process optimization, and materials for 3D printing, designs, and microstructural interpretation of the mechanical characterization of 3D printed parts. As a case study, printability of varieties of polymers is explored using fused deposition modelling (FDM) technique. In particular, the induced microstructure, the thermal behaviour during lying down and the mechanical performance are evaluated and discussed. Finally the ranking of 3D printed parts according to the feedstock material properties is proposed based on simple mechanical criteria.

### Biography

Sofiane Guessasma is a Mechanical Engineering Scientist. He is presently a Senior Scientist at INRA (France) conducting a research activity in the field of Additive Manufacturing of Bio-Sourced Materials. He is a former Research Scientist at Cambridge University, UK, and a currently by-Fellow at Churchill College, University of Cambridge, UK since 2014. He is also a high-end Foreign Expert at Northwestern Polytechnical University, China. He has a key interest on hot topics in Mechanical Engineering, Processing and Material Science. He has several contributions related to the microstructural interpretation of material performance, mechanical modelling, image analysis, and in-situ experiments. He has published over 120 papers in different research fields.

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