

ACEX2020

*14th International Conference on Advanced Computational Engineering and Experimenting
05 - 09 July, 2020 / MALTA*

Cellular Design and Scaling Law Development in Laser Additive Manufacturing

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Laser additive manufacturing delivers value proposition for both individualized and complex components. Cellular solids with a periodic mesostructure [1] are hardly producible by other means of manufacturing and thus predestined for the fabrication via laser additive manufacturing [4] which, however, bears several technological challenges. This ranges from the reliable prediction of mechanical properties through suitable theoretical models to the laser-powder interaction as well as the manufacturing influence on the resulting quality of the component. The laser parameters determine the melt pool width and by that strut thickness of a cellular solid. They are accordingly responsible for the ratio between strut thickness and cell width and eventually determine.