Presentation of the Horizon Europe Project “InShaPe” and the Role of IMT in the Consortium

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The project “Green Additive Manufacturing through Innovative Beam Shaping and Process Monitoring” with the acronym “InShaPe” is a Horizon Europe project, part of Pillar II: Global Challenges & European Industrial Competitiveness and belongs to clusters: Digital, Industry & Space.

The demand for lightweight, strong and durable metallic components is surging in various industrial sectors like automotive, aerospace and energy. Applications like advanced gas turbines require stable yet lightweight heat shields. A crucial technology for this demand is the Powder-Bed-Based Additive Manufacturing of Metals (PBF-LB/M). While promising, PBF-LB/M is not always cost-competitive compared to conventional manufacturing. Enter the InShaPe project, backed by a substantial €6.8 million EU grant, aiming to drive the technology forward. Under the coordination of the Technical University of Munich (TUM), eleven partners from eight countries collaborate on this venture.

The InShaPe project targets the flexible adaptation of laser-beam shapes, tailoring the beam to the material and the geometry of the 3D-printed parts. The benefits include a quicker process, lower costs, and less energy being consumed. Compared to current methods, the project aims to achieve remarkable benefits: a sevenfold production rate increase, over 50 % cost reduction, 60 % lower energy consumption, and 30 % less waste. However, the new conditions associated with the PBF-LB/M process and the laser-beam shapes are creating new microstructures within the printed parts, leading to unexpected mechanical properties. The Institute of Metals and Technology (IMT) has recently joined the consortium with the aim of identifying the extent of the possibilities for tailoring the microstructure in relation to beam shape and controlling the mechanical properties. The main task of IMT will be characterising the printed parts of different alloys and supporting analyses of the printed industrial samples.