Wire Arc Additive Manufacturing - Current developments and industrial applications

In recent years, additive manufacturing technologies have developed rapidly due to their capability of manufacturing complex components without the restriction of conventional manufacturing processes, resulting in reduction of the lead-time, material waste and costs. Nevertheless, there are still significant obstacles in the production of large-volume components particularly in the efficiency of the process. A major impediment in the application of additive manufacturing at industrial scale and its feasibility within sustainable business cases is the limitation in component dimensions and low build-up rate of commonly used powder-based methods.

Due to high build-up rates and material efficiency, wire and arc-based additive manufacturing such as GEFERTEC's 3DMP® process are becoming increasingly important in industrial applications. In comparison to conventional manufacturing processes such as forging or milling, these technologies enable considerable savings in terms of costs and lead times that also allow economical production of large components.

The article focuses on material and process characterization and qualification as well as on a holistic view of the value chain and the factor of economy.

In addition, various industrial applications from aerospace, automobile and tool construction as well as transportation are shown.