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Industrial applications of additive manufacturing and 3D printing technology: A review from South Africa perspective

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Additive manufacturing (AM) is the official industry standard term (ASTM F2792) for all applications of the technology which is also known as 3D printing technology. It is defined as the process of joining materials to make objects from 3D model data, and it is usually layer upon layer, as opposed to subtractive manufacturing methodologies. This technology has gained significant interest within the academic, research institute and industry because of its ability to create complex geometries with customizable material properties. Despite the late adoption of the technology, additive manufacturing has been active in South Africa for past 21 years and it is predicted that additive manufacturing technology will play a significant and game-changing role in the fourth industrial revolution and in particular it promises to play an ever growing role in efforts to re-industrialize the economy of South Africa. At the end of 2006, there were approximately 90 3D printers in South Africa and in 2015, it was estimated that there were 3500 additive manufacturing systems and 3D printers in circulation in South Africa. A reasonable number of these additive manufacturing machines are in the high end of the market, in science councils and higher education institutions and this shows that the future of additive manufacturing in South Africa is very bright compared to other African countries. This paper reviews the past and current industrial applications of additive manufacturing in South Africa from the academic research and industry perspective and what are the benefits of this technology to manufacturing companies and industrial sectors in the country.

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