

Additive Manufacturing of Electrical Machines

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Abstract

Nowadays the electrical machine design is pushed forward by the need of increased energy efficiency, progress of system integration and devices mobility that has led also to investigation of alternative production methods for electrical machines. Additive manufacturing (AM), also known as 3D printing, is opening up new ground for innovations in low-volume production due to faster and cheaper prototyping, reduced lead time and shorter supply chains. It is relatively new technology, which enables the tool-free production of components and entire assemblies directly from a CAD file. Today, the technology is still not widely used in industrial production, but it holds a promise to revolutionize a wide range of fields of industry. In electrical machine research community, the quality, reliability, and performance of 3D printed machine is growing dramatically. It has been proposed that 3D production capabilities of additive manufacturing can be utilized to manufacture electric machines with improved performance. For the practicality of this method, specific mechanical and electromagnetic material properties are required.



Dr. Ants Kallaste was born in Pärnu, Estonia in 1980 and received his BSc, MSc and PhD degrees in electrical engineering from Tallinn University of Technology, Estonia, in 2004, 2006 and 2013 respectively. He is currently a senior researcher in Tallinn University of Technology, Department of Electrical Power Engineering and Mechatronics. In addition, he is holding the position of Head of Chair of Electrical Machines Research Group. He is the member of IEEE since 2013 and Estonian Society of Moritz Hermann Jacobi.

He has spent several years in private engineering companies and visited numerous other research institutions. Amongst other research activities, Ants Kallaste is involved with expertise and consultations of private companies in the field of electrical machines, drives, and their diagnostics.

Dr. Ants Kallaste is authored or co-authored more than 90 international journal and conference papers all with referee practice. He has published a book about electrical machines. Also he is holder of one international patent.