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Development of a New Casting Technique for Titanium Alloys for Biomechanical, Automotive and Aeronautical Applications

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and evaluating its suitability for industrial application.

ABSTRACT

This PhD study program is part of an overall research program that is running in Department of Mechanical Engineering of the University of Minho, in collaboration with the Department of Metallurgical Engineering and Materials of FEUP, aiming the development of new foundry techniques for the production of low density/high strength castings, for aeronautical and automotive engineering applications, as well as in biomechanical applications. This particular PhD project will focus on the development of a casting technique for TiAl alloys, based on the study and evaluation of different ceramic materials capability when used to produce multi-layer ceramic melting crucibles and moulds by different techniques. The research consists mainly in experimental work to identify the most suitable materials for those applications, concerning its performance and production cost, and to characterize the influence of different processing parameters on the castings metallurgical, dimensional and geometrical characteristics. The developed technique will be validated by producing a typical TiAl casting,