

## DocMASE Project Proposal 2011-03

Project Title	<b><i>Surface Phenomena Related to Manufacturing of Titanium Aero-Engine Components: Ti-6Al-2Sn-4Zr-2Mo and Ti-6Al-4V Alloys</i></b>
Main University and Advisor	<b>Lulea University of Technology</b> (Luleå, SWEDEN) Prof. Dr. Marta-Lena ANTTI
Second Univ. and Advisor	<b>Universitat Politècnica de Catalunya</b> (Barcelona, SPAIN) Prof. Dr. Antonio MATEO
Project Description	<i>Titanium and its alloys readily oxidize in oxygen containing environment at temperatures above ~500 °C. The oxidation results in oxide scale formation and oxygen diffusion into the bulk of the alloys i.e. formation of an oxygen enriched layer. This layer is commonly referred to as alpha-case layer. Alpha case is known to significantly reduce mechanical properties, such as tensile ductility, fracture toughness and especially fatigue strength. Alpha case is removed either mechanically by machining or chemically by using milling in concentrated acids. In general, the manufacturing of titanium alloy aero engine components includes various processes that could inflict on the integrity of the components surface in a negative way for the final mechanical properties. This project is developed to increase understanding of these phenomena.</i>