Faculty of Engineering
Summer Research Program 2021-2022

Project Title: Hybrid 3D Printing (Rolling + Printing) of High-strength Beta Titanium Alloy

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Objective

- Evaluate the HyAM process for porosity elimination.
- Explore the influence of HyAM process parameters for microstructure evolution
- Establish the improvement strategy of HyAM process.

Project Details

Monash Centre of Additive Manufacturing has developed a novel hybrid additive manufacturing (HyAM) facility that combines the advantages of AM and forging/rolling into a single process. This process has been shown to effectively reduce the porosity, refine the grain size and the anisotropy properties of various materials such as titanium, nickel-based superalloy and stainless steels. It also improved mechanical properties of thin-walled parts fabricated. The next step is to extend this process to some special high strength alloys system, such as beta titanium alloy for aerospace applications. To do so, process parameters optimization is necessary not only develop the process further but to understand the evolution of microstructure and their mechanism performance.

Prerequisites

Student who is self-motivated and willing to think out of the box. Students willing to do hands-on work especially sample building use 3D-printing will be good but most importantly just someone who is willing to learn as training will be provided. A good understanding of fundamental metallurgy will be preferable.

Additional Information - None