MONASH
ENGINEERING

MONASH University

Faculty of Engineering
Summer Research Program 2023-2024

Project Title: Welding of Additively Manufactured Parts

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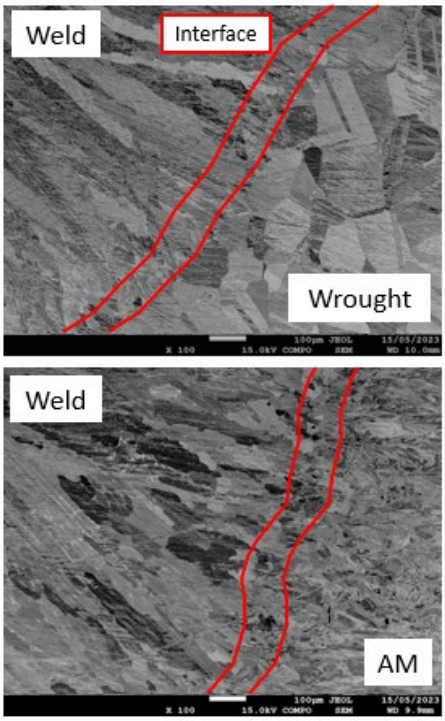
Objective

The main objective of this project is to characterize and qualify additively manufactured material after is has undergone a welding procedure.



Project Details

Additively manufacturing (AM) technology has progressed to the stage where newly developed parts have passed qualification and are currently being installed into existing industrial frameworks. Whilst the material properties of these parts are well understood, allowing qualification for service, it is yet to be widely explored how these parts can be integrated with existing infrastructure. Conventional joining methods, such as welding, are the most practical next step, however it is yet to be understood how welding will affect the mechanical and chemical properties of additively manufactured parts.

In this project, we aim to characterise the heat affected zone (HAZ) of welded additively manufactured parts. Characterisation will entail elements of microstructure evaluation, mechanical testing in the form of hardness and tensile testing, and corrosion assessment, in industry relevant alloys of stainless steel 316L and nickel alloy IN625. The gradient of changing properties across a weld will be investigated for AM-to-AM and AM-to-conventional welded parts.

Prerequisites

Fundamental metallic microstructural knowledge is required for this project and lab-skills in metallography are highly encouraged.

Additional Information

The student will be situated as part of the FutureLab team.