

# Metallurgical aspects of building multi-metal components through additive manufacturing processes

Spyros Diplas <sup>\*,1</sup>, Amin S. Azar <sup>\*</sup>

<sup>\*</sup>SINTEF Industry  
Forskingsveien 1, 0373, Oslo, Norway  
spyros.diplas@sintef.no

## ABSTRACT

Fabricating products consisting of more than one alloy/metal component is always challenging. In general, the challenges can be discretized into two major categories: (i) technology-specific challenges and (ii) material-specific challenges. The state-of-the-art additive manufacturing technologies such as powder bed laser sintering or laser metal deposition are mature enough to handle the technology-specific challenges through a few insightful engineering approaches. However, the material specific challenges are often complicated and originate from various physical characteristics and associated mechanisms. This work will present some innovative approaches towards selecting and/or optimizing engineering parameters and materials based on the physics of the matter during the build process. The aim of this work is to show potential trends which may accelerate innovation within additive manufacturing of multi-metal components within a few wide-spread technologies.

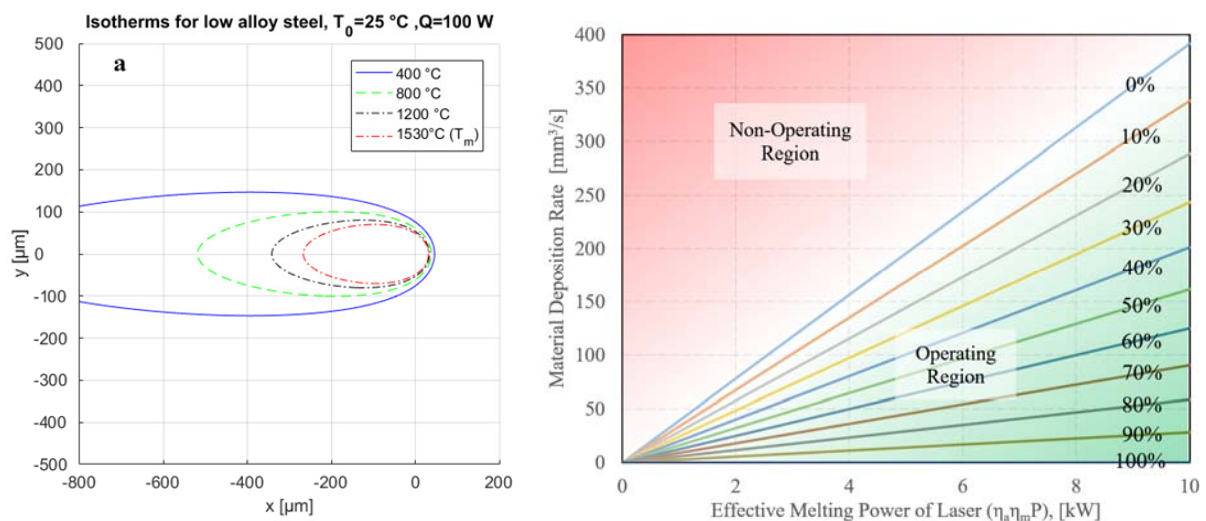


Figure 1: (a) effect of multi-material deposition on the melt pool size and (b) effect of material deposition rate on the operational range of a LMD system.

<sup>1</sup> Corresponding author