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Speaker 5



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In situ heat treatment to improve the metallurgy of hot work tool steel alloy H13 fabricated by laser additive manufacturing

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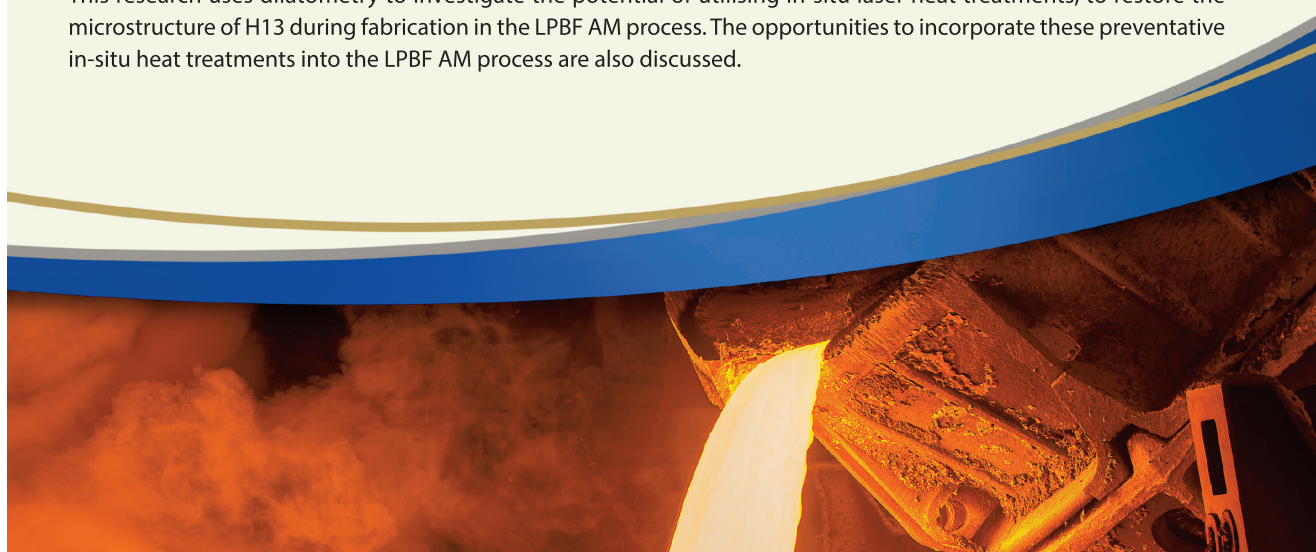
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ABSTRACT:

Laser powder bed fusion (LPBF) additive manufacturing (AM) is a promising manufacturing process for high wear resistance alloys, such as tool steels. The mitigation of subtractive processing means that a tool steel fabricated component does not need to be machined in a softened state followed by hardening heat treatments to enable the high wear resistance characteristics required for tooling applications.

Following the fabrication of H13 fabricated by LPBF AM, stress relieving heat treatments are necessary to reduce residual stresses. This adds time and cost to the process, as well as being reactive rather than preventative to the formation of catastrophic defects in the fabricated material.

This research uses dilatometry to investigate the potential of utilising in-situ laser heat treatments, to restore the microstructure of H13 during fabrication in the LPBF AM process. The opportunities to incorporate these preventative in-situ heat treatments into the LPBF AM process are also discussed.



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