Title	Suitability of Laser Engineered Net Shaping Technology for Inconel 625 Based Parts Repair Process
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In this paper, the Inconel 625 laser clads characterized by microstructural homogeneity resulted from the application of the Laser Engineered Net Shaping technology were studied in detail. During the tests, the laser clad was applied on the model specimens by using optimised LENS process parameters (laser power 550 W, powder flow rate 19.9 g/min, substrate heating to 300 °C), which enabled to deposit defect-free laser cladding. Additionally, the laser clad was applied in at least three layers on the repairing place.

The deposited laser clads were characterized by slightly higher mechanical properties in comparison to the Inconel 625 substrate material. The microscopic observations and an X-ray tomography confirmed that the interface zone between the substrate and deposited material does not contain defects. Mechanical properties and flexural strength of the laser cladding were examined using microhardness and three-point bending tests. It was concluded, that the LENS technology could be successfully applied as the repair process since a similar strain distribution was found after Digital Image Correlation measurements during three-point bending tests for three different specimen: substrate material, additive manufacturing and material with LENS cladding.

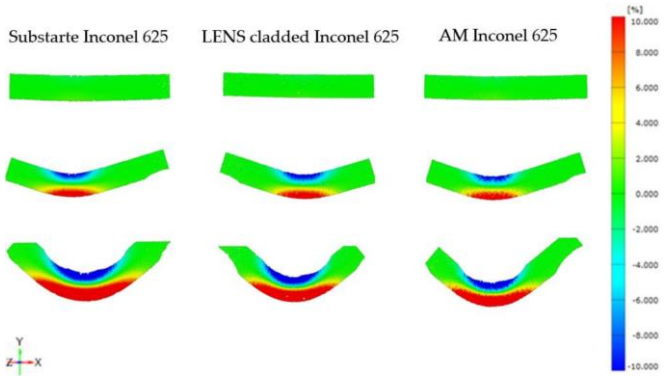

Figure 1: DIC strain distribution maps of the Inconel 625 in the as-received state, with additional clad and additively manufactured.