

The Evaluation of Surface Integrity during Machining of Inconel 718 with Various Laser Assistance Strategies

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Abstract : The paper is focused on the evaluation of surface integrity formed during turning of Inconel 718 with the application of various laser assistance strategies. The primary objective of the work was to determine the relations between the applied machining strategy and the obtained surface integrity, in order to select the effective cutting conditions allowing the obtainment of high surface quality. The carried out experiment included the machining of Inconel 718 in the conventional turning conditions, as well as during the continuous laser assisted machining and sequential laser assistance. The surface integrity was evaluated by the measurements of machined surface topographies, microstructures and the microhardness. Results revealed that surface integrity of Inconel 718 is strongly affected by the selected machining strategy. The significant improvement of the surface roughness formed during machining of Inconel 718, can be reached by the application of simultaneous laser heating and cutting (LAM).

Keywords : Inconel 718, laser assisted machining, surface integrity, turning

Conference Title : ICME 2018 : International Conference on Manufacturing Engineering

Conference Location : Melbourne, Australia

Conference Dates : February 01-02, 2018