

Performance Evaluation and Dear Based Optimization on Machining Leather Specimens to Reduce Carbonization

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Abstract : Due to the variety of benefits over traditional cutting techniques, the usage of laser cutting technology has risen substantially in recent years. Hot wire machining can cut the leather in the required shape by controlling the wire by generating thermal energy. In the present study, an attempt has been made to investigate the effects of performance measures in the hot wire machining process on cutting leather specimens. Carbonization and material removal rates were considered as quality indicators. Burning leather during machining might cause carbon particles, reducing product quality. Minimizing the effect of carbon particles is crucial for assuring operator and environmental safety, health, and product quality. Hot wire machining can efficiently cut the specimens by controlling the current through it. Taguchi- DEAR-based optimization was also performed in the process, which resulted in a required Carbonization and material removal rate. Using the DEAR approach, the optimal parameters of the present study were found with 3.7% prediction error accuracy.

Keywords : carbonization, leather, MRR, current

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