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Influences of process parameters on surface roughness of multi-layer single-pass thin-walled parts in GMAW-based additive manufacturing

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Abstract: Gas metal arc welding (GMAW) based additive manufacturing has been demonstrated to be a promising technique capable of reasonably utilizing materials and energies for manufacturing complex large-size metallic components. However, a critical issue in this technique is the deterioration of surface quality on the side face of fabricated parts. In this paper, a methodology based on a laser vision system was proposed to view the surface appearance on the side face of multi-layer single-pass low-carbon steel parts deposited in GMAW-based additive manufacturing, and a corresponding