

Roughness Enhancement of Parts Produced by Multi-Layer SPIF

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Abstract

Single Point Incremental Forming (SPIF) is a forming technique of sheet material based on layered manufacturing principles. The sheet part is locally deformed through horizontal slices. The moving locus of forming tool (called as tool path) in these slices constructed to the finished part is performed by the CNC technology. The tool path is created directly from CAD model of final product. The forming tool is a Ball-end forming tool, which is moved along the tool path while the edges of sheet material are clamped rigidly on fixture. The one of the most problem in products produced by incremental sheet metal forming process is the poor textures caused by the tool and tool path marks on the products, due to friction between the tool and blank material, this paper present a new method and procedures to overcome this problem by using an insert blank beside the original one with the same material, three insert blanks with different thickness(0.5, 0.7, 0.9)mm have been used to study their effect on the roughness of the final product which is a conical shape, the results shows that there is a significant enhancement in roughness of the final product which accede 63%.

Keywords

Single Point Incremental Forming (SPIF), Tool Path Strategy, Multi-Layer Forming, and Surface Roughness.