Finite Element Modeling of Incremental Forming of Aluminum Sheets

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Abstract. Incremental forming is an innovative and flexible sheet metal forming technology for small batch production and prototyping, which does not require any dedicated die or punch to form a complex shape. This paper investigates the process of single point incremental forming of an aluminum cone with a 50-degree wall angle both experimentally and numerically. Finite element models are established to simulate the process. The output of the simulation is given in terms of final geometry, the thickness distribution of the product, the strain history and distribution during the deformation as well as the reaction forces. Comparison between the simulation results and the experimental data is made.