

## عنوان مقاله:

Experimental and Finite Element Analysis of Single Stage Single Point Incremental Forming

## محل انتشار:

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## خلاصه مقاله:

Incremental forming is one of the non-traditional forming processes which is widely used in rapid prototyping and customized component manufacturing. One of the challenges encountered in single stage single point incremental forming (SSSPIF) is difficulty in achieving greater wall angle for a considerable depth. In this research work, the investigation is carried out by experimental and numerical simulation for reaching the maximum wall angle to a possible depth without any defects in SSSPIF. SSSPIF of truncated cone shaped component from 1mm thick AISI304 austenitic stainless steel are made at a different wall angles. Also, numerical simulation using LS-DYNA explicit solver is performed and the results are validated with the experimental values. Components with the wall angle of 60° is successfully without any defects made in a single stage forming for a depth of 45 mm within the experimented process parameters. Major strain, minor strain and thickness distribution in the sheet material due to forming process are obtained from experiments and finite element analysis (FEA). From the results of both experiment and FEA, it is observed that the major strain, minor strain and thinning effects are higher in the region below the major diameter of the truncated cone at all experimented wall angles. Also the FEA results have shown good agreement with the experimental values. Further it is seen that the strains are increasing with the increase of wall angle.

## کلمات کلیدی:

Finite element analysis, Single stage incremental forming, Strain measurement, Wall angle

## لینک ثابت مقاله در پایگاه سیویلیکا:

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