

Process Planning for Precision Incremental Forming of Complex Parts

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Abstract. The incremental sheet forming(ISF) process is a relatively new sheet forming technology that enables creating parts with relative ease compared to conventional form of sheet metal forming such as stamping or hydroforming. Up to date, the majority of the research done in ISF was regarding the effect of the process parameter to the formability of the material. Furthermore, only a few researches has been conducted in investigating the geometric accuracy of the part formed from ISF. These researches were limited to relatively simple shapes such as cones or pyramid. In this research the Boeing coverpart with 4 separate features was investigated. The sequence of the features were changed and the effect of the feature sequence on geometric accuracy and stress distribution was investigated during and after each stage of forming. The difference in the geometry of the feature induces different amount of hardening in the region of the material which act as a constraint in the local undeformed region resulting in difference in stress state and geometry accuracy. It can be concluded that sequence of the multiple feature depends both on the location and extent of forming that the feature goes through.