Single Point Incremental Forming using a Dummy Sheet - DTU Orbit (11/10/2019)

Single Point Incremental Forming using a Dummy Sheet
A new version of single point incremental forming (SPIF) is presented. This version includes a dummy sheet on top of the work piece, thus forming two sheets instead of one. The dummy sheet, which is in contact with the rotating tool pin, is discarded after forming. The new set-up influences the process and furthermore offers a number of new possibilities for solving some of the problems appearing in SPIF. Investigations of the influence of dummy sheet on: formability, wear, surface quality and bulging of planar sides is done by forming to test shapes: a hyperboloid and a truncated pyramid. The possible influence of friction between the two sheets is furthermore investigated. The results show that the use of a dummy sheet reduces wear of the work piece to almost zero, but also causes a decrease in formability. Bulging of the planar sides of the pyramid is reduced and surface roughness is increased. Lowering of friction between the two sheets by lubrication only influences roughness. Suggestions for applications of this new technique are discussed, among those SPIF of tribologically difficult materials like titanium and soft aluminium.

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