Accumulative Double Sided Incremental Forming Process Design Based on Prediction and Error Models

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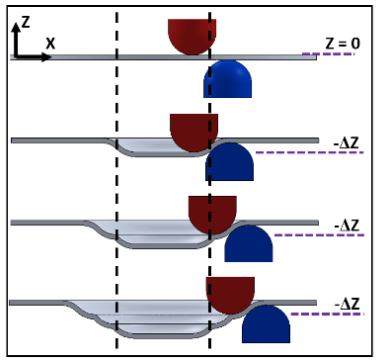
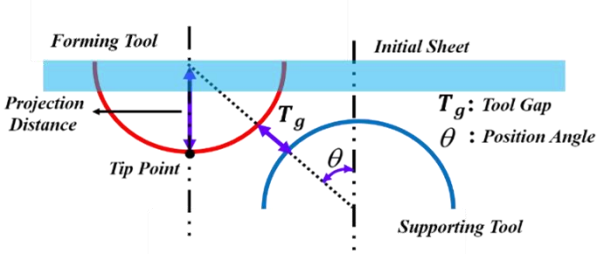
RESEARCH OBJECTIVE

•The objective of this investigation is to implement a systematic design scheme to enhance the dimensional accuracy and quality control of Accumulative Double Sided Incremental Forming (ADSIF) process. The toolpath parameters will be optimized for different desired wall angle utilizing a prediction model. Then, the tool compliance will be considered and compensated for the prediction so that the prediction model can be well implemented and validated by the experimental results. The heat treatment parameters and corresponding material behavior change will also be investigated in this work.

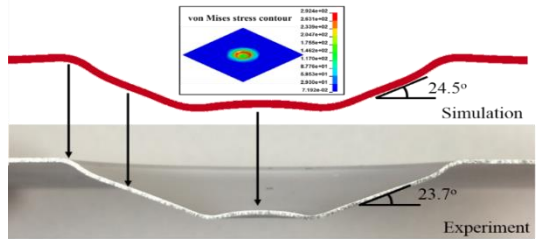
Basic Concept for ADSIF



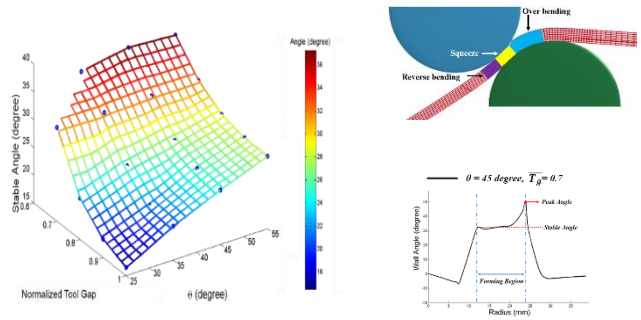
Tool Position Parameters Definition



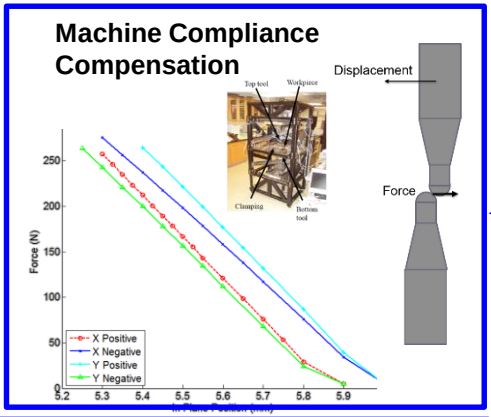
High Resolution Simulation Model



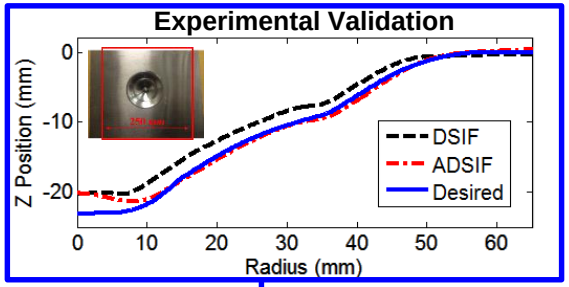
Response Surface for Part Geometry



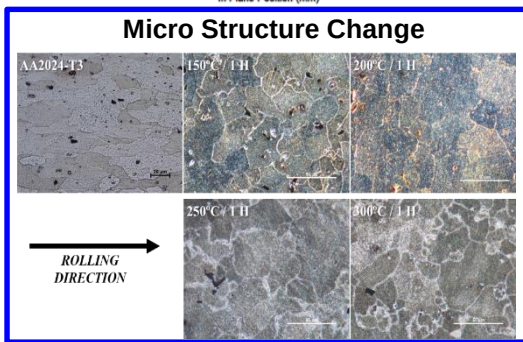
Machine Compliance Compensation



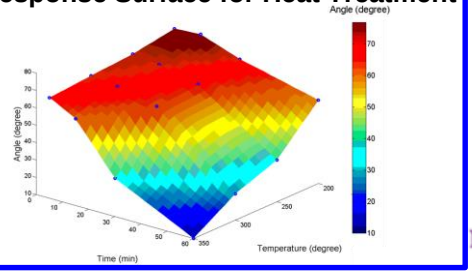
Experimental Validation



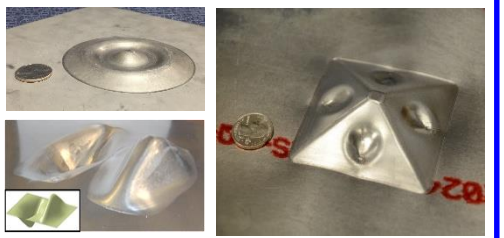
Micro Structure Change



Response Surface for Heat Treatment



Final Part from ADSIF



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