

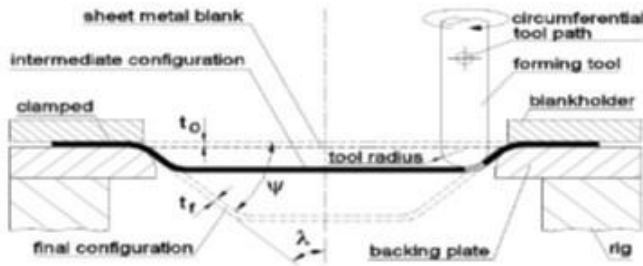
# INCREMENTAL SHEET METAL FORMING (ISMF)

## INTRODUCTION:

Incremental sheet forming (ISF) is metal forming by a progression of localized deformation.

## GENERAL ASPECTS OF ISF TECHNOLOGY:

- New process
- Highly flexible
- Cost of 90% in comparison with stamping
- Slow process reduction in comparison with stamping or drawing
- Specially useful for low and medium sized batches
- It can be developed in common milling machines, robots and specific machines



ECOLOGICAL EVALUATION OF ISF

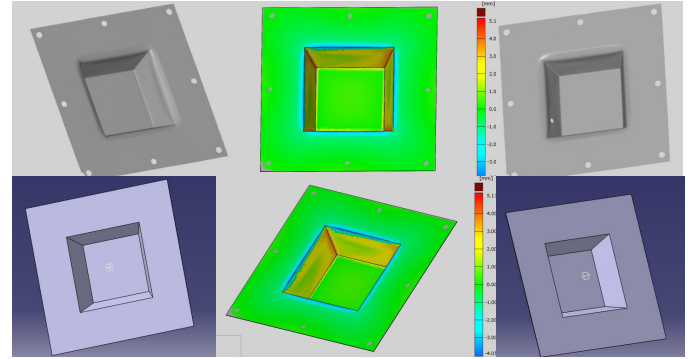
	Energy Savings	Materials Savings
No die required	✓	✓
Localized production – reduction of transportation	✓	
Reworking instead of reprocessing or scrapping	✓	✓
Lower forming forces	✓	
Smaller machines	✓	✓

## OBJECTIVES:

- Manufacturing prototype parts in less time
- FEM simulation tool which will be developed with the datas of after process parameters will enlighten further steps of algorithm development
- Minimizing energy and material consumption

## INNOVATIVE ASPECTS:

- Single Point Incremental Forming (SPIF) is a promising sheet metal forming process for prototyping and small batches, in which the blank is formed in a stepwise fashion by a displacement-controlled small-sized tool.
- Due to specific strain paths induced by the process and limited plastic zones in the contact region between the tool and the workpiece, forming diagrams and forming strategies are different from the classical stamping processes.



## BRIEF DESCRIPTION:

Prototype manufacturing necessitates the production of low products in a minimum cost possible. It is for this reason, the production techniques applicable to mass production can not be applied to prototype manufacturing.

Through the designs, simulations and experimental studies within this project, the mechanical properties of the product that is manufactured using ISF will be determined. Furthermore, through the finite element models, the study will provide tools to predict these mechanical properties before manufacturing process. This will lead to the possibility of obtaining the outcomes of different forming strategies without experiencing them in real production through simulation in the design. Therefore the ISF will be an easily applicable process for the prototype production with the changing forming strategies by the courtesy of the simulation.

Traditional methods usually can not be applied to prototype and low volume production due to feasibility issues. ISF method can be applied with partial or total elimination of dies and allowing for the easy and rapid manufacture of sheet metal parts of complicated profile, with the advantage of requiring none or greatly reduced tooling efforts compared to traditional processes. Scope of this project is to investigate prototype production with ISF technique in automotive industry.

