

# AUTOMAN

## Automated Manufacturing Process Integrated with Intelligent Tooling Systems

### PARTNERS

UNIVERSITY OF BIRMINGHAM  
UNIVERSITY OF STRATHCLYDE  
MANUFACTURING TECHNOLOGY CENTRE  
LOADPOINT LTD  
ULTRAPRECISION MOTION LTD  
WHISTON INDUSTRIES LTD  
MG MOTOR

### FUNDED BY

INNOVATE UK

# OBJECTIVE

**To develop a flexible metal panel forming process suitable for producing doubly curved panels in low volumes**

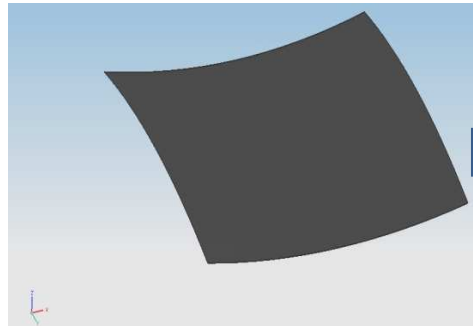
Essential features of the process are:-

1. A tool which is reconfigurable under computer control.
2. Good surface quality - Compliant layers are placed either side of the panel to minimise dimpling, wrinkling and other unwanted surface features that may be generated during forming.
3. Accurate panel shape - Numerical modelling is to compensate for 'springback' effects in the panel and the compliant layers.

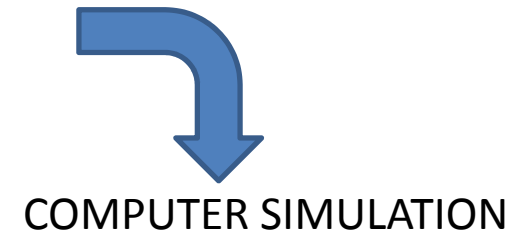
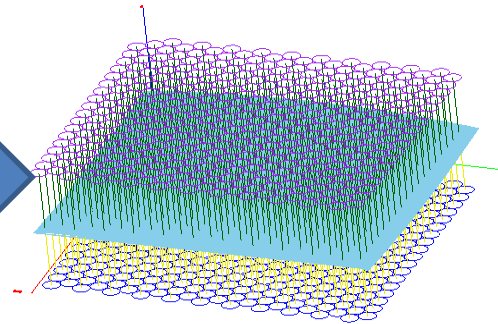
# VISUALISATION OF THE FLEXIBLE PANEL MANUFACTURING PROCESS



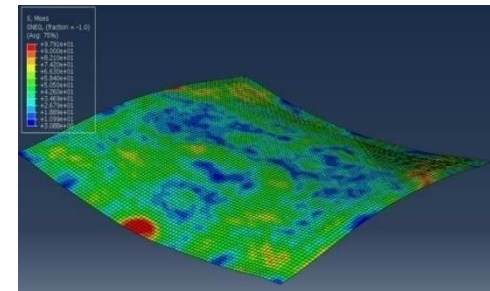
CAD DRAWING



CONFIGURE TOOL



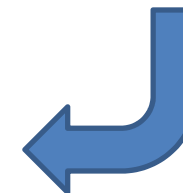
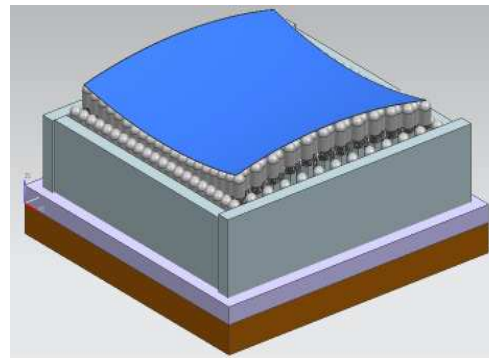
COMPUTER SIMULATION



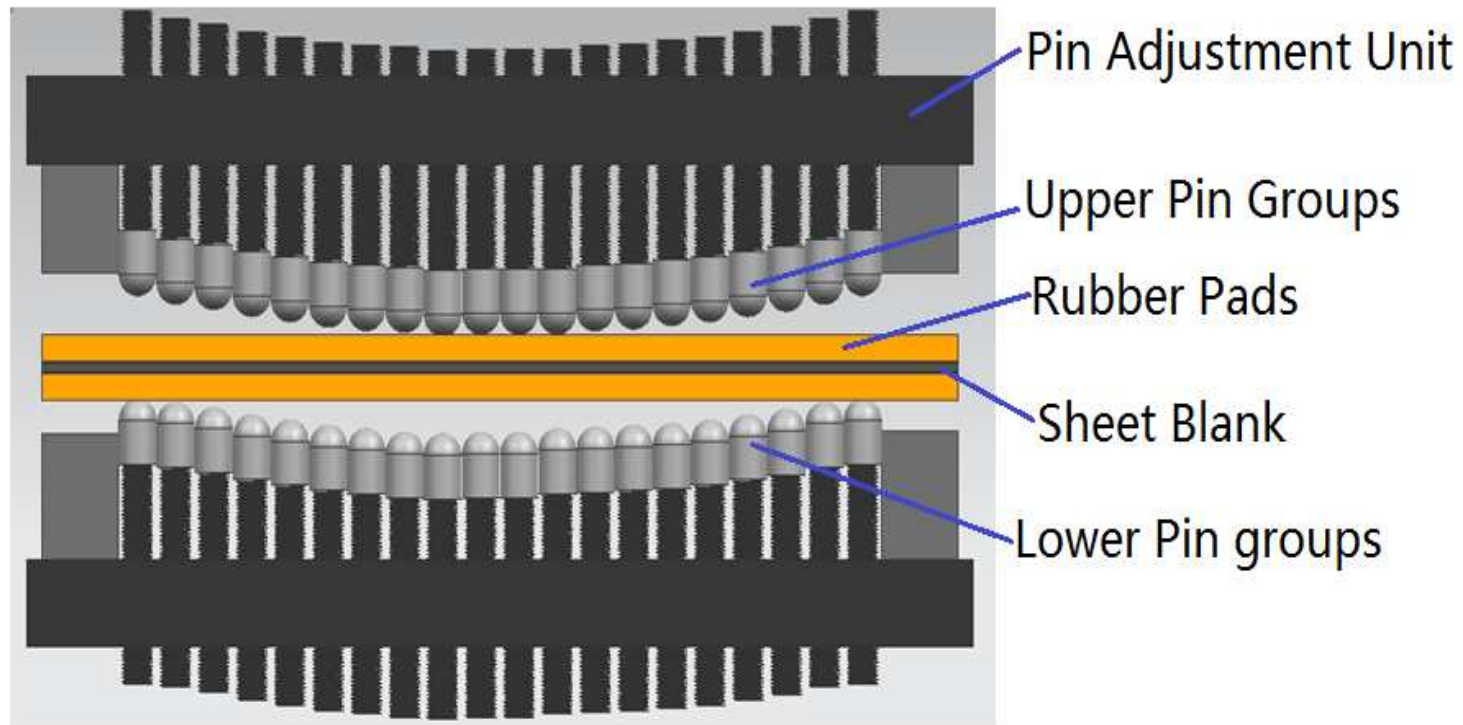
INSPECTION



MANUFACTURE



# RECONFIGURABLE TOOL CONCEPT

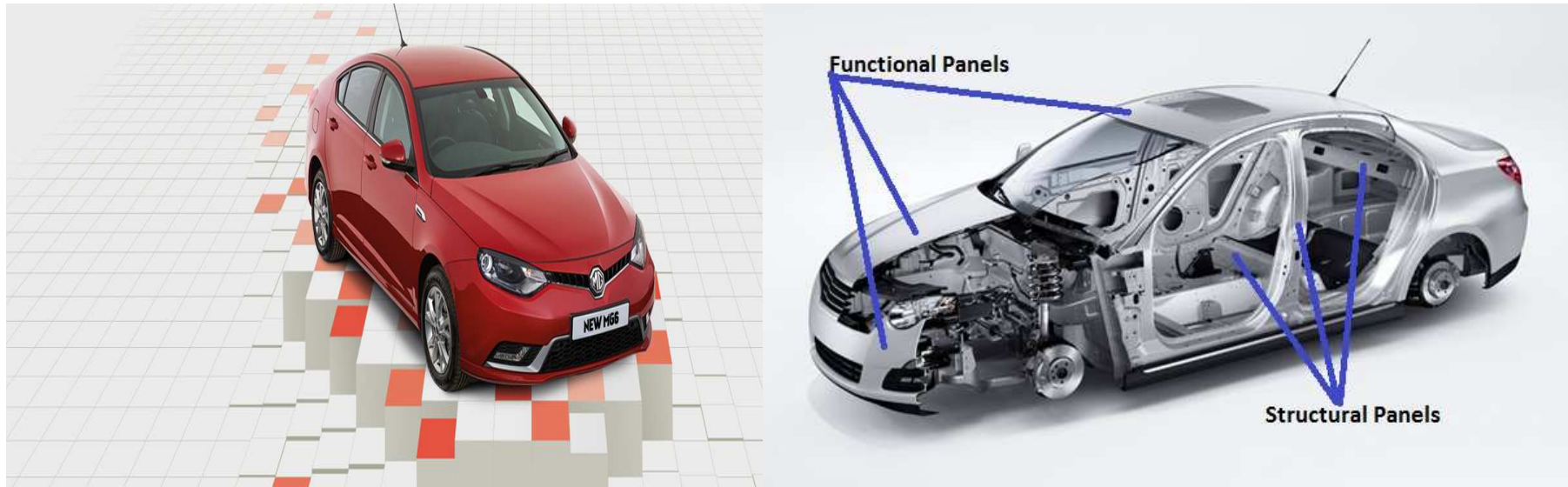


# POTENTIAL BENEFITS



- **REDUCED LEAD TIME- NO TOOL DEVELOPMENT**
- **REDUCED DIRECT COSTS – NO SPECIFIC TOOL COSTS**
- **REDUCED OVERHEADS – NO TOOL STORAGE**
- **REDUCED WASTAGE – FEWER DESIGN ITERATIONS**
- **REDUCED RISK – LOW COST PROTOTYPES QUICKLY PRODUCED**
- **INCREASED DESIGN FREEDOM – NEW SHAPES EASILY PRODUCED**

# OPPORTUNITIES - AUTOMOTIVE



## HIGH VOLUME VEHICLES

- PROTOTYPING
- INCREASED CUSTOMISATION

## SPECIALIST VEHICLES

- REDUCED COST
- REDUCED LEAD TIME
- REDUCED WASTAGE
- REDUCED OVERHEADS

## OPPORTUNITIES - ARCHITECTURE

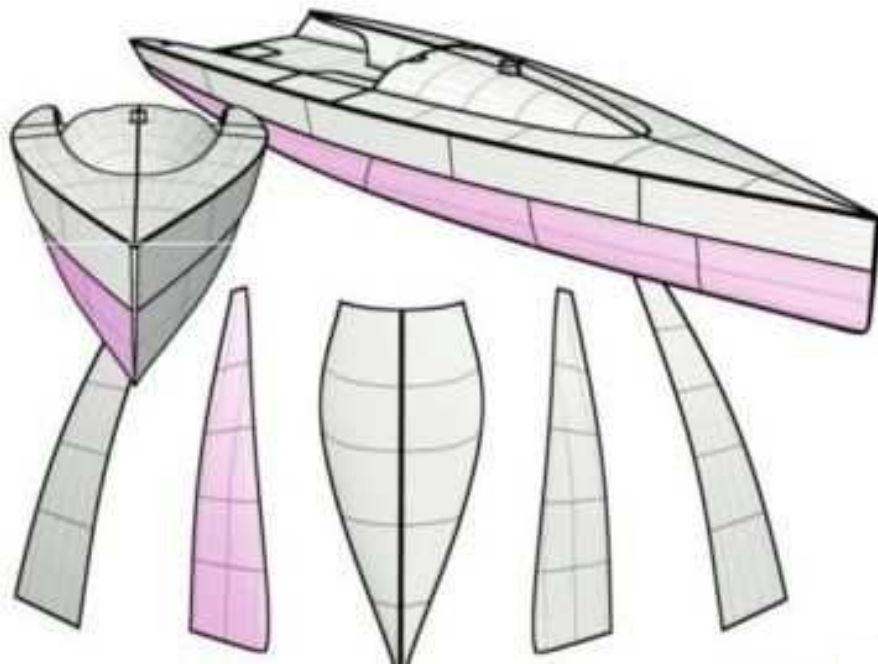


- **CLADDING**
- **ROOFING**
- **SUN SCREENS**

### **BENEFITS**

- **INCREASED DESIGN FREEDOM**
- **REDUCED COST**
- **IMPROVED QUALITY**
- **REDUCED LEAD TIME**

## OPPORTUNITIES - MARINE



**HULL & DECK PANELS**  
LEISURE CRAFT  
TUGS  
FERRIES  
WORK BOATS

### BENEFITS

- INCREASED DESIGN FREEDOM
- IMPROVED QUALITY
- REDUCED LEAD TIME



# CONTACTS

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