



Tim De Souza

## MODELLING CAR MANUFACTURE

High strength steels don't always behave as they should when stamped into car parts. Deakin engineer Tim de Souza is working to simulate and solve the problem.

Car makers use advanced high strength steels to make cars lighter. But the strength of these steels can mean that when car parts are stamped out of sheet metal they distort and don't fit together.

"This is called springback and happens because the steel resists the shaping and wants to straighten as much as possible," says Tim, a PhD student at Deakin's Centre for Material and Fibre Innovation.

He is using computer simulations of this effect to understand how differences in the stamping process and variations in the steel affect the amount of springback.

"The amount of springback can be affected by the steel's thickness, surface texture, strength and ductility, as well as by changes in the process as a result of the small changes in the press over time," says Tim.

"The car industry already uses computer simulation software to cope with springback, but they usually use best-case scenarios and don't take inconsistencies in the steel into account," says Tim.

He has modelled these inconsistencies to see how much change there is in the final part shape from one stamping to the next.

This new approach will give car makers a better understanding of how they can adjust their processes to reduce rejection rates and improve the quality of the parts.

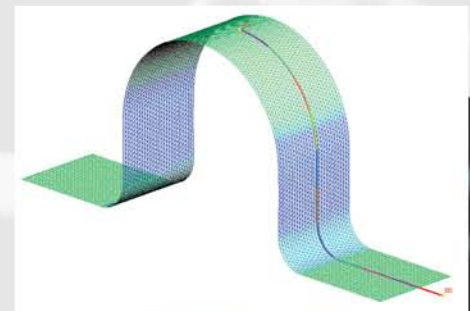
### FURTHER INFORMATION:

Institute for Technology Research and Innovation,  
Centre for Material Fibre and Innovation, Deakin University  
Principal supervisor: Dr Bernard Rolfe  
E: [bernard.rolfe@deakin.edu.au](mailto:bernard.rolfe@deakin.edu.au)  
[www.deakin.edu.au/itri/cmfi/research/areas/sheet-forming.php](http://www.deakin.edu.au/itri/cmfi/research/areas/sheet-forming.php)

**'As pressures on rivers increase, we need to know where the refuges are, as these are the sources of recolonisation.'**



Comparison of springback in an advanced high strength steel for two process windows. Image: Tim De Souza



Simulation of the semi-cylindrical forming process used to analyse the variation in springback under different input conditions. Image: Tim De Souza