

RESEARCH THEME: MATERIALS & SUSTAINABLE MANUFACTURING

AUTOMOTIVE AUSTRALIA 2020

In partnership with the Australian National University (ANU) and the Australian Commonwealth Science Industrial Research Organisation (CSIRO), and supported by the Commonwealth and Victorian governments has the objective of developing a strategic industry roadmap. This roadmap assesses the current and developing industry capability in the "capability map" builds on these capabilities to define an industry direction the "innovation roadmap" to 2020 and beyond.



Project Leader

Matthew Doolan
ANU

Project Participants

DIIRD
ANU
CSIRO
Deloitte Touche
Tohmatsu
IfM
VPAC

COMPOSITES DEVELOPMENT

The objectives of the composites development project are a lightweight, high strength composite technology of low cost, high manufacturing speed, and low environmental impact. The final outcome will be demonstrator sample seat frames suitable for application in a car and a recommended process and material system with a detailed costing of each.



Project Leader

Dr Niall Finn
CSIRO
P: 613 5246 4831

Project Participants

CSIRO
Deakin
Futuris

ADVANCED RIVETING SYSTEM

Fuel economy has become increasingly important in this day and age due to environmental and economical pressures. Decreasing vehicle weight by using HSS, Aluminium and Magnesium alloys, are options to facilitate this. Increased use of these metals in the Automotive industry has caused the need to further develop joining technologies. This project aims to further develop, validate, and demonstrate the effective, efficient application of GM patented rivet technology.

Project Leader

Dr Sri Lathabai
CSIRO

Project Participants

CSIRO
GM Holden

TOOL WEAR PREDICTION

The increased usage of Advanced High Strength Steels (AHSS) in stamping has led to higher press forces, tooling loads and consequently an increase in tool wear problems. Expensive die steel inserts, complex tool coatings and heat treatments can be used to combat these problems but can significantly increase tooling cost and potentially increasing tooling development time. Ultimately this project will develop a tool to predict the likelihood of tool wear problems for a new tool design and facilitate solutions to those problems.



Project Leader

Dr Tim Hilditch
Deakin
P: 613 5227 2265

Project Participants

Deakin
GM Holden
Swinburne

RAPID TOOLING DEVELOPMENT

With the development of new virtual design capabilities and shorter concept-to-production-times the Rapid Tooling Development project will ensure new tooling development does not create production bottlenecks. A scoping study will identify areas for major improvement. A series of sub-projects will identify new die-making technologies, reduce proving-time for new dies, and investigate design requirements for high-strength steels.

Project Leader

Dr Tim Hilditch
Deakin
P: 613 5227 2265

Project Participants

CSIRO
GM Holden
Swinburne
Deakin

ADVANCED WELD MODELLING

Fuel economy has become increasingly important in this day and age due to environmental and economical pressures. Decreasing vehicle weight using Aluminium, Magnesium and HSS is one way to facilitate this. Increased use of these metals in the automotive industry has in turn brought about the need to further develop associated joining technologies. This project looks at modeling welding processes to optimise manufacturing processes.



Project Leader

Tony Murphy
CSIRO
P: 612 9413 7150

Project Participants

CSIRO
GM Holden

DEVELOPMENT OF THE NEXT GENERATION CONVENTIONAL POWERFOLD

The project aims to develop a new powerfold product with improved vibration performance, quieter operation, superior torque capability with higher mass ratings and other value adds to cater better to the needs of a growing automotive powerfold customer base. It is anticipated that the outcomes of this project will directly enhance the global competitiveness of this technology and the sustainability of this industry sector through smarter actuator design and improved manufacturing flexibility and efficiency.



Project Leader

Prof Aleks Subic
RMIT
P: 613 9925 6080

Project Participants

RMIT
SMR

ALTERNATIVE SEAT ADJUSTER MECHANISM

The development of a novel, possibly integrated, design of an automotive seat adjuster system for worldwide application. The main objective is a manufactured and tested proof of concept model and a full assessment of its possible commercial application.

Project Leader

Prof Aleks Subic
RMIT
P: 613 9925 6080

Project Participants

Futuris
Monash
RMIT

AUTOMOTIVE SUPPLIER EXCELLENCE AUSTRALIA

The Automotive Supplier Excellence Australia (ASEA) Program is intended to assist the Australian automotive supply base in achieving international competitiveness and sustainability. Through the creation of an independent, best-in-class benchmarking process and targeted supplier assistance initiatives, ASEA aims to assist automotive suppliers in achieving world-class capability and competency levels.

Website: www.asea.net.au



Project Leader

Dr Victor Pantano
ANU
P: 612 6125 2694

Project Participants

FAPM
ANU
Toyota
Ford
GM Holden
Mitsubishi

ADVANCED SEATING SOLUTIONS FOR PU FOAM

The development of materials for the manufacture of automotive seating, with enhanced properties for recycling, reduced mass and reduced cost. The project will yield environmental advantages whilst maintaining the safety and comfort required from superior automotive seating technology.

Project Leader

Dr Stuart Lucas
CSIRO

Project Participants

Futuris
CSIRO

DIAMOND LIKE CARBON AND HARD COATINGS

CSIRO Industrial Physics and Holden Innovation are researching the application of low friction diamond-like carbon (DLC) to components in the engine valve train. New technology is being employed to deposit DLC onto valves, valve followers and eventually camshafts using Plasma Activated Chemical Vapour Deposition. This process technology holds the promise of large scale coating of components for production engines to improve fuel efficiency.

Project Leader	Dr Phil Martin CSIRO	Project Participants	CSIRO GM Holden
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CARPET ACOUSTICS

This project under the leadership of Dr Xu Wang of RMIT, School of Aerospace, Manufacturing and Mechanical Engineering and in collaboration with Dr Stuart Lucas of CSIRO TFT, will explore methods of evaluating and assessing a number of alternative materials and constructions for light weight, recyclable automotive carpet systems. The objective is to establish a sophisticated portable method of optimising acoustic performance of carpet and interiors systems of future vehicles given different body in white and cost targets.

Project Leader	Dr Xu Wang RMIT	Project Participants	CSIRO RMIT Futuris
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LOW COST COMPOSITES FEASIBILITY STUDY

Low Cost Composites Feasibility Study This project is being lead by Dr Niall Finn of CSIRO TFT with the objective to study the capability and feasibility of producing 3D knitted composite preforms utilising a specialised knitting machine. Alternative knit patterns, fibre materials, binder materials, impregnation, forming techniques and curing methods shall be explored. The mechanical properties of simple 3D tube structures will be tested with the above variables prior to moving on to more complex branched structures to investigate the design flexibility of the concept process.

Project Leader	Dr Niall Finn CSIRO	Project Participants	CSIRO Futuris
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HVAC & REFRIGERANT NOISE STANDARDS

HVAC noise (heating, ventilation & air conditioning) is a major noise source for some fan operating conditions. The project will develop a design handbook for refrigerant systems and a design hand book for HVAC air noise to assist engineers develop strategies for noise minimisation at design.

Project Leader	A/Prof Simon Watkins RMIT	Project Participants	Air Thermal RMIT
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LOW GLOBAL WARMING POTENTIAL REFRIGERANT

Design and build, instrument and test, under Australian conditions, a car air-conditioning system that uses an improved working fluid with a low global warming potential. This project is to keep Australia abreast of developing European technology and legislation to utilise more environmentally friendly refrigerant gas than the current R134a (gas).

Project Leader	Chris Dixon RMIT	Project Participants	Air Thermal RMIT
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LIGHTWEIGHT WHEEL

The ultimate goal is to develop and apply new methodologies for wheel design that produce the lightest possible part while safely sustaining the actual loadings encountered. Lightweight wheels not only directly contribute to vehicle mass reduction but give lower suspension loads allowing savings in the vehicle structure for a compounding benefit.

Project Leader	Phachara Niumsawatt VPAC	Project Participants	VPAC GM Holden
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