

Additive Manufacturing and Lightweighting Solutions for Automotive Suppliers

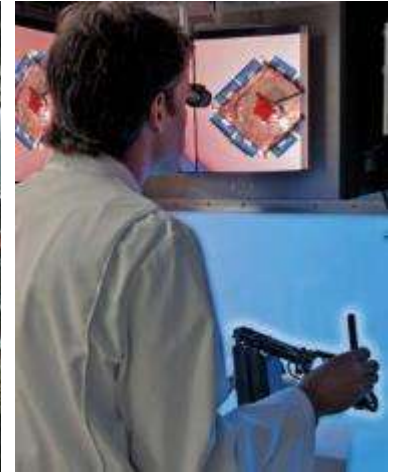
David Muir

Director R&D, NRC London

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A century of innovation



1920s

Concrete for a harsh climate

1930s

Redesigned steam locomotive

1940s

Wartime innovations: radar, atomic energy

1950s

Pacemaker, electric wheelchair

1960s

Crash position indicator

1970s

Anti-counterfeiting technology

1980s

Canadian Astronaut Program, Canadarm

1990s

Synthetic meningitis C vaccine

2000s

Simulated brain surgery

2010s

100% biofuel test flights

NRC Automotive and Surface Transportation

Areas of Focus



Lightweighting



**Power Train
Efficiency**



**Vehicle
Electrification**



**Advanced
Manufacturing**



Design Systems



**Heavy Duty
Vehicles**

Aluminium Technology Solution: ALTec Industrial R&D Group

rethink
aluminium



Warm and hot forming of various aluminium sheet alloys at high production rates



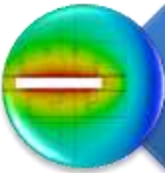
Development of durable structural adhesive joints of minimally pretreated multimaterial structures



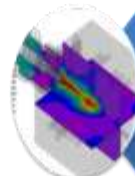
Heating coatings for multifunctional intelligent moulds



Design and production of large hollow extrusions with thin walls



Tribological coatings for multifunctional intelligent moulds



Vacuum-assisted high pressure die casting of hollow aluminium structural nodes



Al/Steel friction stir welding (FSW): strategies and reduction of forces and moving toward a robotic solution



Evaluation of the in-service stress corrosion cracking (SCC) performance of high strength aluminium alloys



Weldability assessment of Al alloy AA7075 and the esthetic optimization of lap joints



Mitigation of galvanic corrosion of aluminium in dissimilar material assemblies

NRC STAMP Composites Group Industrial R+D



Focus on high-performance composites

- Long and continuous fibres (glass fibre, carbon fibre, aramid fibre)
- Thermoplastic and thermoset polymers



Focus on solutions for automotive industry

- Lightweighting solutions using high-performance composites
- Cost-efficient manufacturing processes

NRC Additive Manufacturing Capabilities

Laser Consolidation

Direct Energy Deposition

Cold Spray



Tooling



Intricate design



Repair



Aluminum Shaft



Copper



Aluminum Wheel

David Muir
Director of Research & Development
NRC London

Email: David.muir@nrc-cnrc.gc.ca

Phone: 519-430-7095

Mobile: 519-200-1072

