



# SPLICE

Specialist Polymer Lightweight springs:  
Innovative processing using Conventional Equipment

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## About the project

The SPLICE project set out to determine whether lightweight polymer springs could be manufactured using existing conventional processes used to manufacture steel springs. Researchers at WMG, part of the University of Warwick, together with Force Technology, the Institute of Spring Technology (IST) and the Northern Automotive Alliance (NAA), won research funding worth £244,090 from Innovate UK for the project. The project has been led by the IST.

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## Benefits of polymer springs

Polymer production is less energy and raw material intensive than either silicon steel wire or titanium wire. Polymer springs can also be easily recycled at the end of their life.

Lightweight polymer springs have the potential to lower emissions and improve fuel economy in automotive applications. They could replace heavier steel springs in other sectors. Polymer springs are also corrosion resistant and can be used when steel cannot, due to their non-magnetic and electrically insulating properties.

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## Results

The SPLICE project was successful in proving that lightweight polymer springs can be manufactured using conventional processes, by modification of a manual spring coiler (found in many factories) with the addition of a heating stage. No significant new tooling was required, allowing cost-effective high-variety production at low to medium volumes. Initial testing shows that the polymer springs had very promising performance.

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## What next?

Additional research is needed to develop the optimum properties for polymer spring materials and applications. With further development, polymer springs could be used cost-effectively for a range of applications in the automotive, transport, aerospace, space, marine, oil & gas, electronic and medical sectors. This would result in new market opportunities for the UK spring industry.



## SPLICE Partners

### Institute of Spring Technology (IST)



The Institute of Spring Technology is recognised as the spring industry's most authoritative and influential voice, renowned as a unique centre of excellence for spring technology. It is the

only members' trade association at the heart of the UK spring making industry and it also attracts global members from all continents. The IST covers all aspects of research and development, training programmes, problem solving and testing, and has an ISO17025 accredited laboratory where it undertakes failure analysis.

### University of Warwick - Warwick Manufacturing Group



WMG, at the University of Warwick, is an internationally recognised group with over 300 staff plus industrial secondees in 6 dedicated co-located buildings, with construction

of a seventh building in progress. With over 30 years' experience of working with industry, its research is publicly and privately funded and always involves industry closely in conception, development and delivery. Its research teams are comprised of staff from both academic and industrial backgrounds.

### Force Technology



Force Technology was established to pave the way for development and innovation in the high precision, high duty spring markets. The technology leading manufacturing

company is focused on continuously improving its products and systems whilst developing its innovative approach to design and development of processes. As well as advanced processing facilities, the company also has a metallurgical laboratory and component testing facility, with engine dyno, to continue to build its industry-leading approach to innovation.

### Northern Automotive Alliance (NAA)



The NAA is a wholly independent, not-for-profit organisation providing support for all companies within the automotive sector in the North of England. As well as business

support and provision of funding it provides development and participation support to Innovation consortia, having experience of both project and contract management of large scale projects through ERDF & AMSCI.

### Innovate UK



Innovate UK is the UK's innovation agency. It works with people, companies and partner organisations to find and drive the science and technology innovations that will grow the UK economy. For further information visit [www.innovateuk.gov.uk](http://www.innovateuk.gov.uk)