

# Robots find regular teeth brushing helps them munch through 50,000 aluminium spot welds

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Resistance spot welding research by Paul Briskham at the University of Warwick's Warwick Manufacturing Group in conjunction with Douglas Boomer of Innoval Technology and engineers from Jaguar and Land Rover has achieved a landmark result of 50,000 high quality welds on automotive-grade aluminium sheet using just one set of standard copper electrodes on an automated robotic welding system.

The remarkably long electrode life was achieved by polishing the copper electrodes during the brief gap in time between each welded component.

Resistance spot welding is the most widely used process for joining steel sheet in the automotive industry, largely because it is the most cost-effective method for high-volume production and excellent at pulling together components prior to welding. However, a major hurdle preventing the adoption of this joining process for aluminium automotive sheet has been the problem of short electrode life and associated loss of weld quality.

Previous studies have shown that the electrode life can be extended to a few thousand welds by regular tip dressing using a form-cutter, of the type commonly deployed to maintain the electrodes when welding galvanized or high-strength steels. This study has demonstrated the significant additional improvement in electrode life that can be gained by using a system that polishes the electrodes with an abrasive wheel to

maintain their domed profile.

This resistance spot welding study has also investigated low-cost methods for detecting electrode damage to determine automatically when to conduct electrode maintenance and when to change the electrodes, which could lengthen the electrode life even further.

Source: University of Warwick

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