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# Industrial Member Report Summary – Key Findings for Industry

## Initial Feasibility Study of the Potential of Resistance Spot Welding Steel to Aluminium using Interlayer Transition Materials

TWI Core Research Programme

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## Industrial need

The global automotive sector is in a process of evolution, moving towards; more efficient, less polluting, safer vehicles with greater functionality. One key milestone to achieving this is weight reduction. Most high volume car manufacturers see the most economical way of achieving future light-weighting requirements to be a multi material strategy incorporating a steel / aluminium body structure.

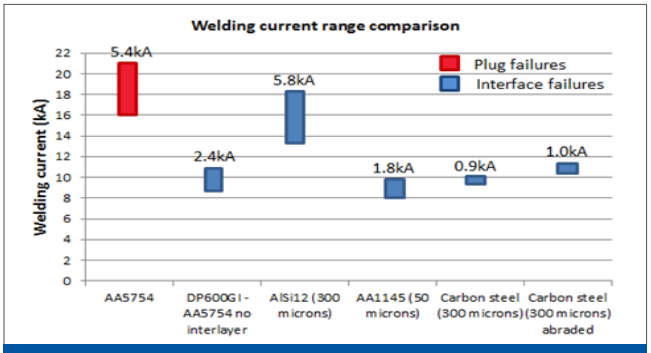
At present resistance spot welding is the most widely applied automotive joining technology, used intensively by nearly all car manufacturers. So TWI have set out to find a method that allows fast, high volume joining of high strength zinc coated steels to aluminium car body panels using conventional resistance spot welding equipment.

## Key Findings

A range of commercially available interlayer materials was tested to find out if an industrially relevant welding process could be achieved between zinc coated high strength steel and aluminium sheet. The following was observed:

- Weld tensile shear strengths equal to or greater than aluminium welded to its self were achieved in the dissimilar joints.
- Welding current ranges large enough for high volume spot welding applications were achieved.
- However, none of the interlayer materials tested in this study was able to produce full plug weld failures in destructive testing.
- The greatest weld strengths were achieved with a 5μm foil of 99% pure aluminium

Steel to aluminium spot welded joint using a 99% pure aluminium inter layer




Welding current ranges achieved between DP600 + zinc and AA5754

## How to benefit from this work:

- As an Industrial Member of TWI, you have free access to the full report
- If you are not an Industrial Member of TWI, find out how your company could benefit from Membership www.twi.co.uk/membership
- Read more http://www.twi-global.com/services/research-and-consultancy/core-research-programme/technical-literature-reviews/resistance-spot-welding-with-transition-discs/
- Contact sullivan.smith@twi.co.uk to learn more