

Industrial Member Report Summary – Key Findings for Industry

Resistance Spot Welding Steel to Aluminium using Interlayer 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. 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 resistance spot welding process was developed that was able to join steel to aluminium in combination with a structural adhesive.

- A reliable spot welding process was achieved using a standard resistance spot welding gun.
- In uniaxial tensile testing of weld bonded joints, high failure loads were recorded.
- Welding current ranges large enough for high volume spot welding applications were achieved.
- Multi pulse welding programs were able to produce high quality porosity free welds.
- In destructive testing partial plug / sheet pull out failure modes were obtained.

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-global.com/membership
- Contact sullivan.smith@twi.co.uk to learn more

