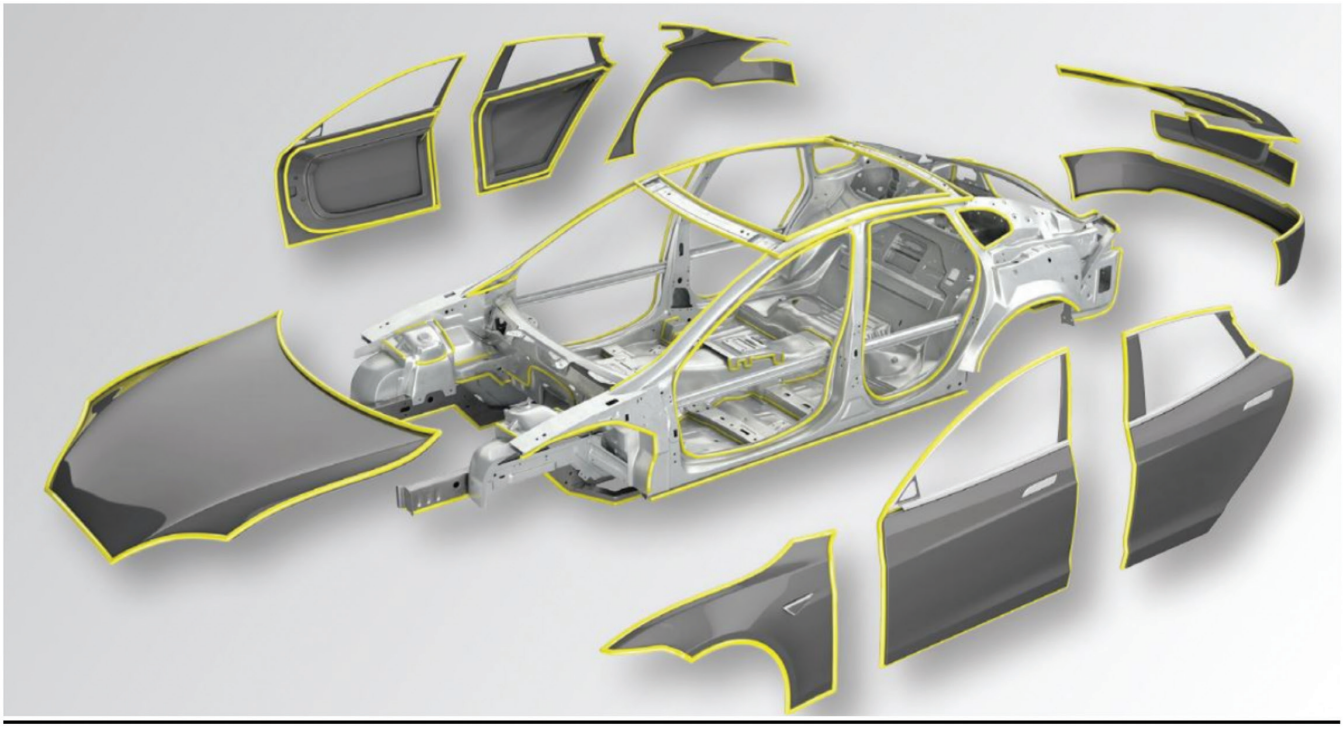
TECHNICAL REPORT

I-CAR NEW ZEALAND

AUTOBODY ADHESIVES

- MAKING SENSE OF OEM REQUIREMENTS FOR WELD-BONDING



While a substantial number of our articles endeavour to describe new and emerging technologies, it is perhaps just as important to take a step back now and again and re-examine some of the methodologies that are now commonplace for vehicle-makers to incorporate in their vehicle platforms, at every level.

Without doubt, OEM's are expanding the use of adhesives throughout the modern auto body – that expansion extends well beyond just exterior, low stress parts and closure panels. Our previous tech report on one-time fasteners (in particular rivets), highlighted the fact that in many structural applications, adhesives are used in conjunction with other attachment methods, such as rivets, threaded fasteners or welds - often referred to as "Hybrid attachment".

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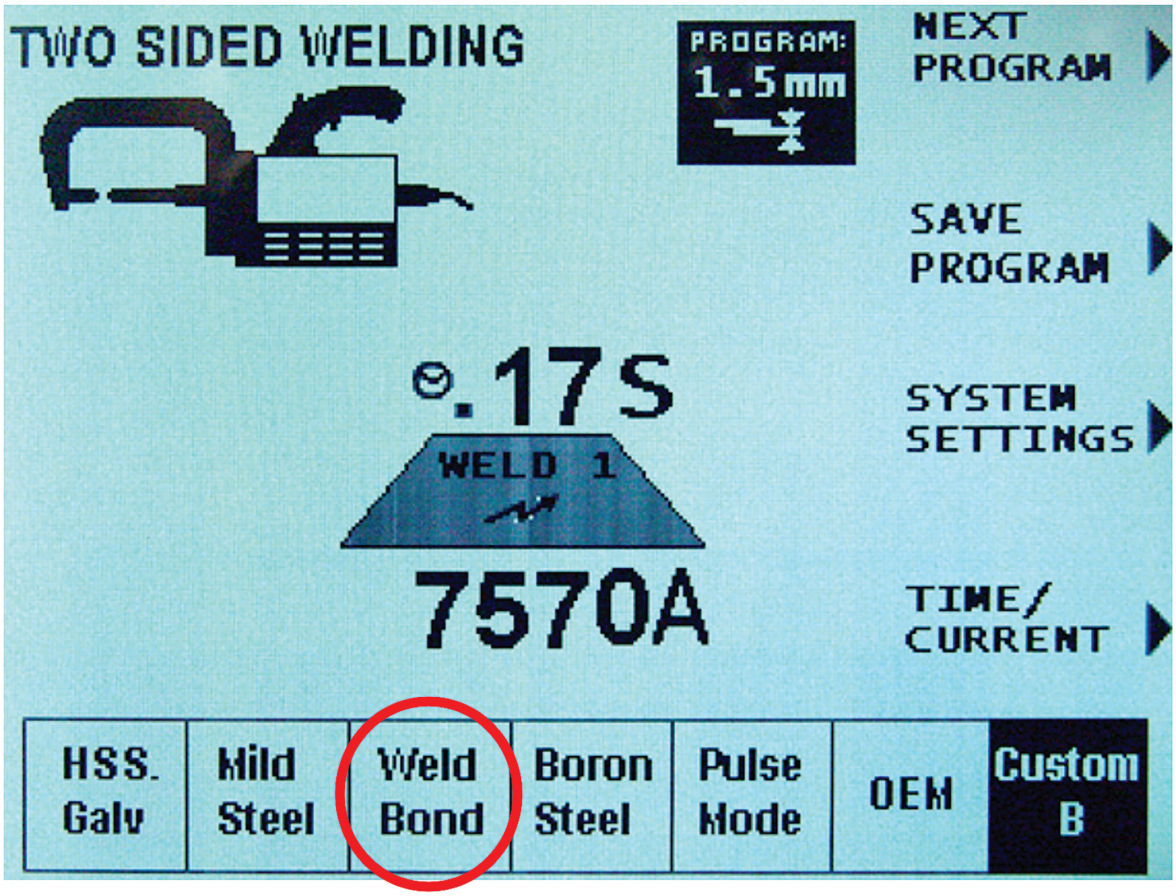
Targeting the “WELD – BONDING” process identifies that we will be welding or fusing steel parts together in conjunction with an adhesive material. This is where some confusion becomes apparent as the repair technician could be welding **through**, or **alongside**, an adhesive.

Welding **through** adhesives, irrespective of whether they are uncured (wet) or cured (dry), can ***only*** be done using Squeeze Type Resistance Spot Welding or STRSW. In most instances, welding will be performed while the adhesive is still wet. Inverter spotwelders should be used as this technology ensures correct fusion of the metals and a minimal Heat Affected Zone (HAZ), with the weld site "encapsulated" by the adhesive. Many newer machines have weld – bond settings that take into account the changed conductivity created with the addition of an adhesive in the weld joint / flange.



Additionally, other equipment / tools may be required, such as a **"Shunt Clamp" – recommended when STRSW weld-bonding.**

Welding **alongside** or in close proximity to an adhesive will often also be required- MIG plug welds will be needed in areas where either access to both sides of the joint (required for STRSW), is not possible, or the plate/stack thickness may exceed the OEM limits for spotwelding.

This is not the ideal welding method, as in addition to a larger HAZ, there is a greater opportunity for cross contamination, and an increase in the risk of fire. It can be completed successfully however, if the technician does the appropriate research and preparations ahead of following a weld-bonding schedule.

Frustratingly, many BRM's do not include a lot of detail on how the MIG plug weld-bonding process is done –

In general terms, the recommendation is to keep the weld site clear of adhesive for a distance of 25mm or 1 inch – this "bare metal zone" is the ideal distance, as the welding process heats the adjacent adhesive material to the point where it will "flow" around the cooling weld.

Obviously, the welding process needs to be very precise, as welds that are either too hot or too cold will have a detrimental effect on both the strength of the weld, and compromise corrosion protection.

Identifying where MIG plug welds will be required prior to fit up and bonding.

Be aware that there is a greater risk of fire and cross contamination when MIG plug-welding adhesive bonded panels.

The I-CAR course ADH01 – Adhesive Bonding, provides more information on this subject…

These articles have been written by Martyn Lane: I-CAR Instructor, Weld Test Administrator and Technical Specialist to the auto body industry