# Magnetic Pulse Welding of Aluminum to Steel

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## Abstract

Many exotic combinations of dissimilar metals have been solid state bonded using both magnetic pulse welding (MPW) and its analogous process, explosive weldinc (EXW). In this poster we are presenting recent unpublished work that has been carried out on the down-to-earth combination of aluminum to steel which cannot be successfully joined by conventional fusion welding processes. The alloys presented here are AA6061 and AA5042, used extensively in the automotive field, joined to carbon steels in the range AISI 1008-1020. Advantage of the use of a weld interlayer placed between the A1-Steel weld combination is also presented.

Both optical and electron microscope study of the welded interface microstructures will be presented along with energy dispersive spectroscopy microanalysis, as well as microhardness profiles, as well some limited mechanical testing results.

The results presented in this poster clearly show the weld quality achievable for this commercially useful combination. The ability to satisfactorily weld this metal combination will surely have profound economic consequences for the automotive industry.