

New automatic welding system makes car production cheaper

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Credit: AI-generated image ([disclaimer](#))

European researchers have found a way make the automotive sector more eco-friendly, while at the same time cutting production costs. The EU-funded project SMARTDRESS ('Adaptive tip dress control for automated resistance spot welding') is developing a fully automated control system to improve crucial welding processes.

The global automotive sector produces around 60 million vehicles per year. In the primary stages of [vehicle construction](#), manufacturers rely heavily on resistance spot-welding (RSW), a process in which steel or other metal surfaces are joined by heat generated by electric current.

In this phase of car production, manufacturers use RSW guns with electrode 'tips' - the elements that are placed directly in contact with the metal pieces to transmit current. When these tips get worn, weld quality can suffer, resulting in interruptions in production, and, by extension, loss of revenues.

According to project partners, most spot weld quality problems can be traced to poor electrode tip dressing. This is a major cause of interruptions in the manufacturing process.

With a new vehicle typically rolling off a [production line](#) every one to two minutes, a welding tip issue causing even a five-minute line stoppage, once per day, can result in a loss of 10 vehicles per week, equating to about EUR 7 million in lost revenue per year.

Dresser systems for maintaining tip quality are already in use on many production lines, but current solutions require manual set-up, optimisation and continued monitoring during production, which cannot be efficiently performed for large production lines.

In addition, today's tip dress systems cannot be used in the high-volume production of aluminium assemblies, preventing the use of RSW and requiring high-cost technologies such as self-pierced riveting.

The SMARTDRESS system will be intelligent, automatically optimising, monitoring and maintaining RSW electrode tip quality.

The new technology will allow for the first time aluminium welding,

which until now was not done on a commercial scale. This technique will lower the cost of manufacturing vehicles made from aluminium. The widespread use of aluminium for vehicles would reduce vehicle weight, and potentially help cut CO₂ emissions.

The SMARTDRESS system may provide a real competitive edge, allowing European automotive suppliers to sell more cars in an important global market.

SMARTDRESS has received over EUR 1.1 million in EU funding and will complete its work before the end of 2013.

More information: smartdress-project.eu/cordis.europa.eu/projects/rcn/101398_en.html

Provided by CORDIS

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