



Scienxt Journal of Mechanical Engineering & Technology
 Year-2023; Volume-1; Issue-2, pp. 51-68

*Weldability and electrode life determination of
 resistance spot welding of secondary coated
 automotive interstitial free steel*

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<https://doi.org/10.5281/zenodo.10033153>

Abstract:

Organosilane is a secondary coating applied over a primary coating of interstitial free (IF) galvanized (GA) steel. It boosts corrosion resistance and is hence often used in automotive applications. In this investigation, the resistance spot welding of secondary coated GA-IF steel of 0.8 mm thickness has been studied. The effect on the mechanical properties such as: tension & cross tension strength, nugget diameter and the corresponding failure mode because of change in welding current and respective time was evaluated. In this way, the weld lobe was drawn and weldability of weldments were investigated. It has been found that the energy required to weld the nugget increased by 9 % after 1440 number of uninterrupted spot welds with uniformity in the weld nugget. This article also addresses the test protocol for estimating span of the welding electrodes. It has been perceived that, the electrodes can withstand up to 1440 number of uninterrupted welds without affecting the weld quality (in terms of the joint's strength). Nevertheless, the failure mode changes drastically after 600 number of welds due to expulsion during welding. The initial and final stereo images of truncated electrode which was used in this experiment were reported to know the condition of electrode after 1440 number of continuous spot welds and found that the bottom electrode was more eroded than that of top electrode.

Keywords:

Organosilane coated GA-IF steel; resistance spot welding; tension test; failure modes; weldability lobe.