

Micro-Resistance Welding of Nickel Plated Steel

S.J. Dong and Y. Zhou

Dept. of Mechanical Engineering
University of Waterloo
200 University Avenue West
Waterloo, Ontario, Canada N2L 3G1

Micro-resistance welding of 0.10- to 0.30-mm nickel-plated steel was investigated experimentally. The effects of process parameters (welding current, welding time, electrode force, electrode gap, electrode extension) on joint strength, nugget diameter, electrode-sheet sticking and electrode wear were studied. In particular, the effect of TiC coating on electrode tip life was studied. The experimental results indicate that the welding current and electrode gap are most important parameters that affect the nugget diameter at the cathode electrode, electrode-sheet sticking and the electrode tip life. The reduction in nugget diameter is must faster at the cathode electrode than that at the anode electrode. The wear mechanisms when using the TiC coated electrode is also discussed compared to the uncoated electrode. Based on the results of this work, optimum process parameters are recommended for micro-resistance welding of nickel plated steel.

Key words: Micro-resistance welding, nickel-plated steel, TiC-coated electrode, electrode wear mechanism, nugget diameter