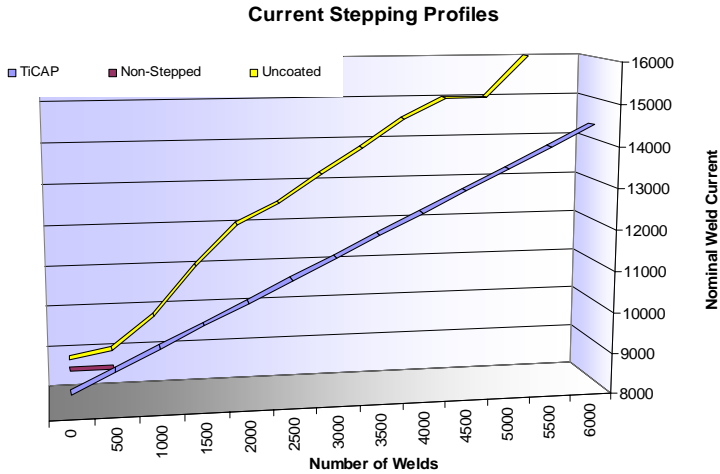




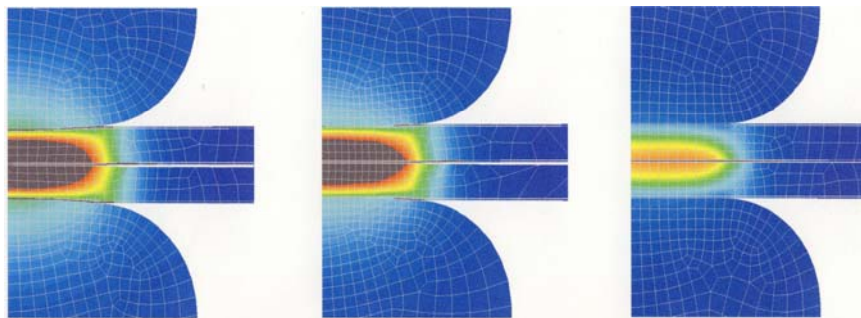
CURRENT STEPPING

Current stepping (gradually increasing current over the life of the electrode) in resistance welding compensates for electrode wear (“mushrooming”) by maintaining a consistent current density (Amp/mm²) and hence acceptable weld size. The ideal (longest) electrode life will be obtained with a low current stepper slope (small current increases) and a predictable current step frequency (rate) while maintaining a minimum sized weld nugget without expulsion.



In the chart at left, a non-stepped constant current (red line) shows the short electrode life without stepping. The CuCrZr electrode (yellow) shows the life extension by current stepping. The use of TiC coated electrodes gives the stepper character a much more predictable slope and yields the best life.

Many independent tests have shown that TiC coated electrodes perform well due to their lower slope and regular and modest stepping current frequency. Because the TiC coating changes the way the electrode degrades over time, the stepper profile is smooth and predictable – ideal requirements in production.



A larger weldface **reduces** current density. Here, the Sorpas simulations show declining weld nugget size with a constant current and an increasing electrode face diameter. (Left to Right)

When the current is increased by the stepper to compensate for the increase in electrode face diameter, the current density is **increased** and the weld size returns to an acceptable level. **Current stepping is the most inexpensive method of extending electrode life.**

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