

Measuring displacement for spot welding applications produces two primary quality measurements--initial thickness and setdown.

Initial Thickness--A measure of the initial part stackup after force is applied but before current is fired.

- Checks for correct part dimensions and stackup
- Monitors tool wear
- Signals fault for missing parts

Setdown--The dimensional difference in the position of the electrode before and after the weld.

$$\text{Setdown} = \text{Initial Thickness} - \text{Final Thickness}$$

- Monitor correct "setdown" as one key element of weld quality. Compare this with predetermined acceptable setdown data.

Practical Considerations

Recommended Sensors--Because the setdown value for a typical spot weld is only several thousandths of an inch, Sensotec recommends using a Linear Variable Differential Transformer (or LVDT for short) to get the most reliable data.

Sensor Mounting--It is important to mount the spring-loaded LVDT (see Tech Note 115) as close to the workpiece as possible, and to ensure that the housing or arm for the lower electrode is stiff. While the lower electrode may deflect during the weld, for most practical applications, this deflection will be repeatable and therefore will be accounted for during calibration.

