

There are several important aspects of measuring displacement during resistance welding to help ensure weld quality.

### Some Definitions:

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

**Final Thickness**--A measure of the final position of the electrode after the "hold" period but before the electrode is retracted.

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

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

### Sensors Used to Measure Displacement:

Sensotec offers two practical methods to measure displacement for resistance spot and projection welding. One is a linear potentiometer and the other is a Linear Variable Differential Transformer (or LVDT for short).

1. Linear Potentiometer--The advantage of the pot is the simplicity of the associated instrumentation. The pot is a voltage divider and requires only a voltage source to produce an output proportional to displacement. The disadvantage is that a pot requires mechanical contact between the brush and the resistive element and can provide a wear point.

2. LVDT--The advantage of the LVDT is reliability and ruggedness. This device consists of an electro-magnet moving in a coil and has no inherent contact points to wear out. The disadvantage is associated with the required electronics. However, Sensotec has incorporated LVDT amplifiers as part of all WeldMeters thus making this transparent to the end user.

