

■ Resistance Welding: Verification of Welding Process Using Signature Analysis

**Highlights:**

- High speed data acquisition
- Easy to install and configure
- Multiple signature checks
- Envelope signature
- Defects found:
  - Insufficient clamp force
  - Incorrect current
  - Part presence
- Multiple test limits

A large manufacturing company that uses resistance welding to weld metal brackets to metal pipes recently integrated Sciometric's SigMETER® into their assembly line process to eliminate defects and ensure consistent maximum part quality.

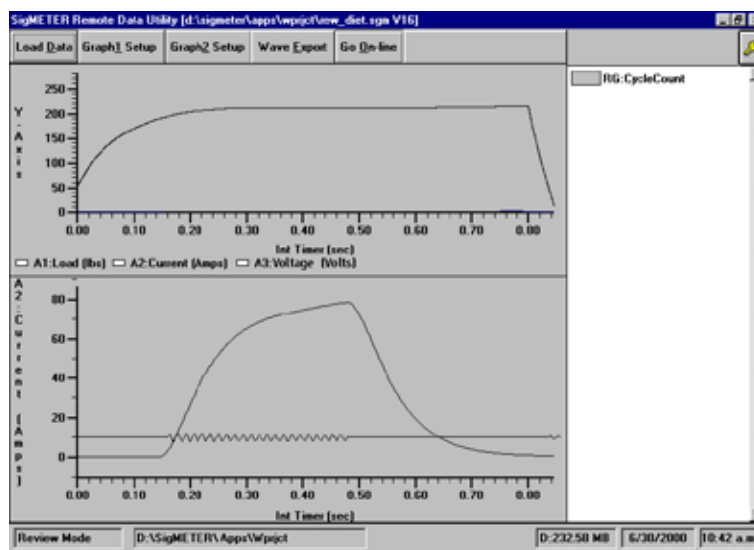


The combined power of the SigMETER® and the ease with which it can be installed and configured made set-up quick and easy. A load cell, a current transformer, and a linear encoder are connected to a SigMETER® and are used to monitor and measure the tube and bracket weld assembly process.

The load cell measures the pressure (clamp force) applied to hold the bracket to the metal pipe, a current transformer is used to measure the RMS secondary current, ensuring that the amount of current used to perform the weld is correct, and a linear encoder is used to measure setdown. The SigMETER® collects the data from these three sensors and then using signature analysis techniques compares the data to acceptable pass standards. If these standards are met, the SigMETER® issues the operator a Pass, allowing the weld process to continue. If the standards are not met, the SigMETER® issues the operator a Fail and a defective or sub-standard quality part is avoided.

The SigMETER® is also configured to count the number of welds performed, so that tool wear can be monitored. The operator is automatically issued a warning at pre-set intervals, thereby avoiding poor welds previously experienced due to undetected tool wear.

Prior to installing the SigMETER®, the manufacturer encountered several assembly line production problems. Insufficient or excessive pressure applied to the part, incorrect current, shunt current and undetected tool wear resulted in compromised part quality and unnecessary production defect costs. The incorporation of the SigMETER® in this assembly process clearly illustrates how Sciometrics advanced products and technologies can be used to eliminate expensive production and assembly line defects.



SigMETER® Screen showing Waveforms Produced by Load, Secondary Current and Voltage

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