



## Crack Testing of Hypodermic Needles

### Background

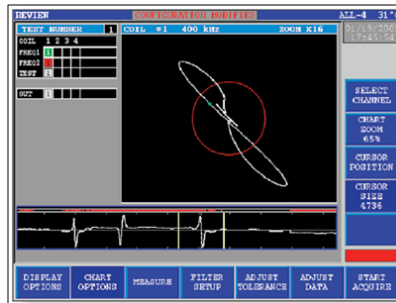
Doctors, hospitals and individuals depend on the highest quality hypodermic needles to administer medicines and draw fluids. Unfortunately, 100% visual and/or water leak test inspection of the needle tubing or finished product for microscopic cracks or defects is nearly impossible. A hypodermic needle manufacturer has integrated automated eddy current testing solutions from Criterion NDT in their production lines to test 100% of their material for cracks and defects.

### Situation

Medical grade hypodermic needles are available in numerous diameters and wall thicknesses. A hypodermic needle manufacturer wanted to detect through-wall cracks down to 0.100 inches (2.5 mm) long x 0.004 inches (0.1mm) wide in needles down to 0.011 inches (0.28 mm) in diameter. The manufacturer's process commences with the forming and welding of medical grade stainless steel. The tubing is drawn through forming dies, annealed, and then straightened prior to cutting.

### Solution

The Eddy Current testing system consists of an eddy current encircling coil and instrument interfaced to the production line cutting/sorting mechanism. For the hypodermic needle application, the manufacturer installed the eddy testing solution just prior to the needle cutting process where defective materials could be easily cut out in-line, in real-time. The test is designed to find defects in both the weld and raw material.



The eddy current instrument induces an electromagnetic signal into the material under test via the encircling coil. Eddy currents are generated within the tubing material and then sensed by the same encircling coil and fed back to the instrument. The instrument compares the received signal with a "known good" signal and determines whether a defect is present. The InSite instrument allows the operator to set flaw detection thresholds and reduce false alarms. If a defect is present, the instrument sends a control signal to a PLC in the cutting/sorting mechanism which automatically removes the defective material from the production line.

As the hypodermic needle manufacturing process runs continuously, the eddy current encircling coils are subject to extreme wear conditions.



To provide maximum durability and life, Criterion NDT uses TTZ (Trans-Toughened Zirconia) ceramic coil inserts to protect the electrical coil windings.

### Benefits

100% in-line, real-time eddy current inspection can help ensure the overall quality of the product without sacrificing production throughput. It also helps manufacturers identify problems early on in the production process helping to reduce scrap. Eddy current testing is a green technology and does not require the use of chemicals or dyes.

