



Tubing Manufacturer Realizes Dramatic Reduction in Product Returns and Scrap Using Eddy Current Inspection

Scope

Recently, a leading manufacturer of extruded, thin-wall aluminum tubing used to manufacture automotive heat exchangers became aware that their product had an unacceptably high failure rate. In the beginning, only sections of their product were being returned as end users found defects. Soon the end users found it was highly likely the whole product reel was bad and would return the entire reel. This is when the manufacturer called.

Application

Find through-wall pinholes, 0.010" OD or smaller, that allow refrigerant to leak.

Before eddy current

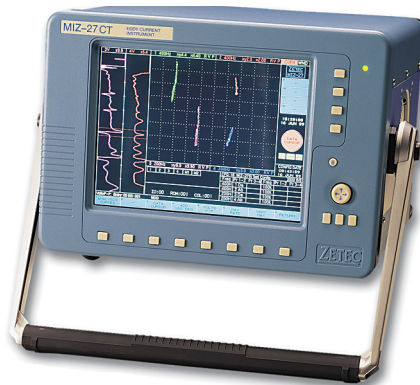
Previous inspection method was visual. In an effort to catch small holes in the tube, a line operator would monitor the flow of newly extruded material as it passed through a tank of cooling water. They used an overhead mirror, which they occasionally monitored from their control panel position, with the hope of spotting a telltale stream of bubbles. When bubbles were spotted, the operator would use spray paint to mark area. Since the tubing was moving at a pace close to 3-ft/second, the operator had to be quick. In an effort to not miss the defect, a large section of tubing was marked. Essentially, this was a hit or miss operation that did not guarantee defect capturing and resulted in excessive scrap material.

The Challenge

The tubing had a tendency to undulate between the extrusion die and the winding reel. This had the potential to create a lift-off signal nightmare.

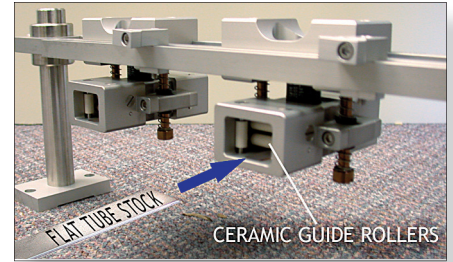
The Solution

Since each press had multiple extrusions, multiple Zetec +Point® array probes were mounted in a custom fixture. Each probe had its own dedicated



MIZ®-27CT to operate its multi-coil array and collect inspection data. Ceramic rollers guide the product through the probe center and minimize lift-off signals. Custom designed spring-loaded sled assemblies were built to follow the material undulations rather than force it to conform to a fixed position and risk possible product damage.

This unique +Point coil arrangement detects interruptions in the eddy current flow caused by imperfections and through-holes in the tubing as it passes through the coil. The MIZ-27CT continuously monitors the test coil electrical signals. To identify the exact area of the reject indication, the MIZ-27CT



Logic Alarm outputs were used to trigger paint marking systems.

Additional benefits from eddy current inspection

- Detection of restricted or plugged channels inside the multivoid tubing
- Detection of Zinc coating splatter, which created the potential for developing localized hot spots on the tube wall while in service
- Detection of surface cracks, laps, and inclusions

With dramatic reduction in returned product and scrap material, the customer was extremely satisfied with the solution and outfitted their remaining presses with eddy current. A new extrusion facility was started and the application engineers, now at Criterion NDT were asked to provide equipment on all the multi-extrusion presses.