

APPLICATION NOTE

RELIABLE EDDY CURRENT TESTING OF COPPER TUBES UNDER ECCENTRIC CONDITIONS

Off-center material movement can affect defect detection in bar and tube production. The DEFECTOARRAY sensor compensates for changing sensor-to-material distances, enabling more consistent inspection results even under eccentric testing conditions.



THE CHALLENGE

In industrial tube production, vibration, worn guides and dimensional variations can cause material to move off-center within an encircling coil. The resulting changes in clearance affect inspection sensitivity, potentially leading to missed defects or false rejects. Conventional encircling coils evaluate the entire circumference through a single channel, making it difficult to distinguish between actual defects and signal variations caused by material movement.

THE SOLUTION

FOERSTER's DEFECTOARRAY sensor uses eight independent eddy current segments, each with integrated clearance measurement and compensation. In a comparative study, a 22 mm copper tube with a 1 mm reference hole was tested under controlled eccentric conditions. As the tube was displaced by up to 2 mm, DEFECTOARRAY maintained defect detection without manual gain adjustment, while the conventional encircling coil required additional amplification or lost sensitivity.



THE RESULT

The study demonstrated more consistent defect detection as sensor-to-material clearance increased. At 1 mm offset, the conventional coil required 6 dB additional gain, while DEFECTOARRAY required none. At 2 mm, only DEFECTOARRAY continued to detect the reference defect under the original settings. Its segmented design also enables circumferential defect localization, supporting more reproducible quality control and detailed inspection analysis.

THE PRODUCTS

DEFECTOMAT DA



Digital Eddy Current Testing for Reliable Detection of Transverse Defects in Long Products such as Tubes, Bars, Wire and Profiles

DEFECTOARRAY



Segmented Encircling Coil for Highly Sensitive Eddy Current Testing of Tubes and Bars

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