

The Matrixeye for Spot Welding Inspection

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The Matrixeye for Spot Welding Inspection is a testing equipment for inspecting the joint state of spot welding by ultrasonic nondestructive inspection technology using advanced FMC / TFM (Full Matrix Capture and Total Focusing Method). FMC/TFM method using a matrix-array probe, which include 15MHz, 64 pieces of piezoelectric elements with 8 x 8 arrangement, is applied to visualize spot welding area three-dimensionally with high-resolution. It enables to achieve quick and accurate measurement by high speed parallel processing for 3D image synthesis. For ultrasonic nondestructive inspection, it is necessary to make the ultrasonic waves enter the inspection object at an optimum angle. Matrixeye can visualize the inside of spot welding in real time. For this reason, the position and inclination of the probe can be easily adjusted, and an accurate inspection can be performed. In addition, we have developed a software that automatically identifies spot welding joints by analyzing this 3D image of spot welding. The software can measure joint diameter, joint thickness, dent depth, joint area, etc. automatically, and determine pass or fail according to the user's acceptance criteria. Moreover, the software can be controlled without operating the main unit of the device with a hand switch, and it has a convenient function considering use in the field. This paper describes the details of the Matrixeye for Spot Welding Inspection equipment.