



# VJ INSPECTION SYSTEMS

**A VJ Technologies Company**

## **Advanced Defect Enhancement (ADE)\***

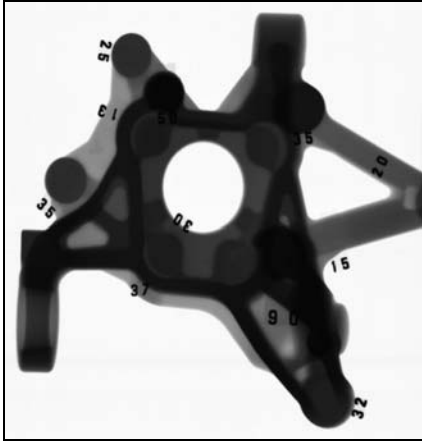
Advanced Defect Enhancement (ADE)\* technology is a proprietary software of V.J. ElectroniX that improves the visibility of defects across different material densities. By eliminating the need for manual adjustments of kV, mA, iris opening, contrast, and brightness for different regions of the x-ray image, the ADE technology provides higher quality inspection and reduces costs by decreasing inspection time.

In traditional x-ray systems, manual adjustments are made to the x-ray output, detector lens, image contrast and brightness to improve the visibility of low-contrast defects. These manual adjustments result in a longer inspection duration and inconsistent decision-making across operators, which have major cost implications. Further, manual operator adjustments introduce a high level of subjectivity across inspectors. This means that engineers cannot rely on the output from the x-ray system without having to worry about the variability across operators.

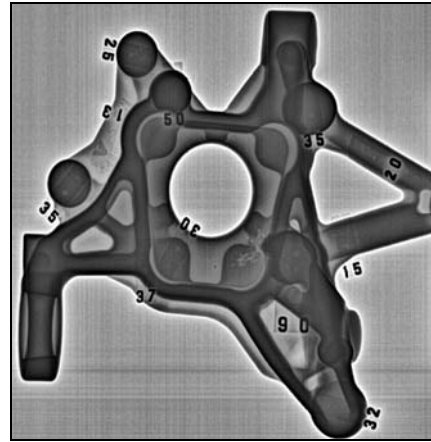
ADE technology provides a sophisticated image enhancement tool for automatically optimizing across density gradients for each region of the x-ray image. Since it does the enhancement in a single pass, the enhanced image shows practically all defect structures, eliminating the need for any manual x-ray output, detector, contrast, and brightness adjustment. This directly leads to substantial cost reduction, as the inspection period for each part is significantly decreased and consistency across operators is increased.

ADE also results in higher inspection quality as defect visibility is substantially improved. This aspect is particularly relevant as the material densities of substances being inspected get lower and lower. For example, inspecting non-silver doped epoxy, or optical fiber splicing. These low-density materials when assembled in components with other high-density material are almost impossible to inspect with standard x-ray systems. This is due to the contrast depth of modern day analog detectors. The typical image intensifier has an eight bit output which goes through an A to D conversion leading to a five bit image depth or thirty two shades of gray on the monitor. With such limited contrast resolution, it is difficult to capture subtle features at the lower fringes of the grayscale spectrum. With the introduction of ADE, these features on the fringes of visibility will now be obvious to the engineer.

\* - Patent Pending



Raw Image: Knuckle



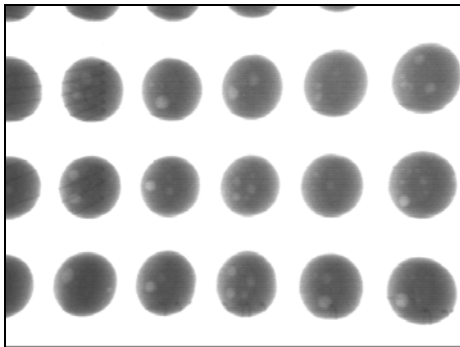
Enhanced with ADE: Knuckle



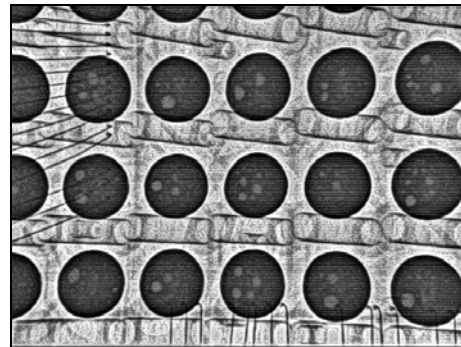
Raw Image: 55-Gallon Drum



Enhanced with ADE: Drum



Raw Image: BGA



Enhanced with ADE: BGA