ELECTRIC & ELECTRONIC

Measurement of Dome Shaped Component

Problem Identified

Inspecting dome-shaped components poses significant challenges due to light reflections and inconsistent contrast on curved surfaces. Critical bottom-side features, including circular radius that were difficult to capture using standard inspection not only consumed more time but also failed to guarantee uniform accuracy, especially on complex geometries. Inadequate detection of these dimensions risks assembly defects and long-term product reliability.

Solution Provided

A vision-based measurement system was tested to capture dome part dimensions from both top and bottom perspective. To overcome surface reflection and shadowing issues, the use of specialized lighting was proposed to enhance contrast of the part. This adjustment enabled the system to highlight edges and radius that were otherwise invisible under normal illumination. By customizing the imaging process, the solution adapted to the parts geometry and ensured reliable data collection.

Results & Summary

The vision system was able to measure the dome key dimensions, although bottom side detection required lighting enhancements for consistency. Once optimized, the system improved accuracy in extracting complex radius and reduced the need for manual intervention. Inspection times were shortened, and the part rejection due to measurement uncertainty was significantly reduced. This allowed the manufacturer to maintain higher throughput while improving product reliability.

The solution enhances quality control, reduces rework, and ensures better product consistency for industries requiring complex geometries.