EDM Intelligent Solutions
Manufacturing - Metrology

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Applications Report: 3D Metrology Services for Electronics Manufacturing
Form Scan and Dimensional Analysis of Molded Electronic Housing

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Executive Summary

Modern electronics enclosures require precise dimensional integrity to ensure proper fit, assembly, and function within compact and complex devices. EDM Intelligent Solutions provides advanced non-contact 3D metrology services that allow micron-scale form measurement of molded components. This white paper details our inspection methodology for an engineered plastic electronic housing using the MVi5 3D Metrology Center.

Overview of 3D Metrology Capabilities

Our 3D scanning technology captures detailed surface data to allow comprehensive form measurement of components with complex geometries. Dimensional attributes such as radii, angles, slots, and step heights can be extracted from cross-sectional profiles created within the 3D dataset.

Key capabilities include:

- Non-contact 3D scanning for high-resolution form analysis
- Profile slicing for detailed dimensional extraction
- Applicable to plastics, metals, and hybrid assemblies
- CAD comparison and form deviation analysis

Application Case Study: Molded Electronic Housing

Component Overview

- Type: Electronic Housing
- Material: Engineered Plastic
- Metrology System: MVi5 3D Metrology Center
- Metrology Service: Form Measurement

Form Scan Inspection Process

Step 1: Capture Full 3D Data

The first step of the inspection involves capturing a complete 3D surface scan of the electronic housing using our MVi5 3D Metrology Center. This system collects dense point cloud data across all visible surfaces of the part with micron-level accuracy.

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Step 2: Generate Cross-Sectional Profiles
Once the 3D model is created, virtual profile slices are made through key areas of the part to extract dimensional data. This step allows for precise measurement of features such as wall thickness, slot width, angles, and internal contours.

Step 3: Form Measurement and Dimension Extraction
Dimensional measurements are then taken from each profile section. Typical metrics include radii, step heights, angular deviation, and symmetry. All measurements are compiled and evaluated for tolerance conformance.

Step 4: Reporting and Analysis
Finally, the data is visualized and formatted into a detailed inspection report. Results can be used to validate tooling, identify process variation, or compare against CAD models for design verification.

Results & Value Delivered

- Full surface scan for comprehensive dimensional verification
- Identification of form deviations and geometric non-conformance
- Non-contact method ideal for fragile or lightweight molded parts
- Improved tooling feedback and design validation

Conclusion

Electronic housings must meet tight tolerances and complex design specifications. EDM Intelligent Solutions provides the accuracy, repeatability, and resolution needed to inspect these parts thoroughly using advanced 3D metrology. Our robotic, non-contact system delivers the insights needed for improved quality, reduced scrap, and faster time to market.

About EDM Intelligent Solutions

EDM Intelligent Solutions is a trusted provider of high-precision machining and metrology services. With capabilities tailored for the electronics, aerospace, medical, and scientific sectors, we support our customers with intelligent solutions for complex inspection and manufacturing challenges.