

# 3D Engineering Expertise & CT Scanning Capabilities Offer Non-Destructive Testing of Inaccessible Internal Structures, Passages

At 3D, our personnel and equipment provide a new paradigm for manufacturers seeking precise non-destructive inspection of complex parts and assemblies with otherwise inaccessible internal cavities. Our metrology staff features engineers with expert credentials in 3D quality assurance, and pioneering experience in CT scanning technology. Engineers at 3D work with state-of-the-art CT scanners that produce precise qualification measurements through the world's most advanced 3D x-ray technology. These scanners, in the hands of expert engineers, provide exact, actionable data on internal complexities without destruction of parts.



## New CT Scanners - Powerful, Precise, Cutting Edge

The CT scanning systems at 3D Engineering Solutions set the standard for power and precision in non-destructive measuring and modeling. The systems work by taking digital x-ray images from many angles, and combining them into a

3-dimensional model that can be used to evaluate internal structures with high dimensional accuracy. Our ability to see inside a part or an assembly without destroying it is of great value for many needs in design troubleshooting and manufacturing.

## Capabilities of CT Scanning

- 3-D Computed Tomography (CT)
- Scan to CAD Comparison
- Scan to Scan Comparison
- Porosity Analysis
- Scan to CAD Model Creation
- Composite & Fiber Analysis
- GD&T Measurement & Verification
- Wall-Thickness Analysis
- Inclusion Analysis
- 2-D Radiographs
- Failure Analysis
- Complete Segmentation
- 2-D Image Stacks
- Custom Movie Visualizations



# Applications for Advanced Industrial CT Scanning

Whether fossilized dinosaur eggs, complex automotive assemblies, or aerospace components, 3D Engineering Services provides expert data and services in industrial CT scanning. Many industries embrace CT scanning technology, as do those with interest in historical preservation. At the same time, many turn to CT scanning for part, assembly or system re-engineering, reverse engineering, tool replication, product failure evaluation and more.

## Solving Measurement & Qualification Difficulties through CT Scanning

Many complex part or assembly configurations create difficulties in measurement and qualification because of sight-line issues, or confined and inaccessible spaces. Metrology-grade advanced CT scanning technology addresses many of those difficulties, such as:

- Internal passage visualization and measurement
- External feature data capture, obscured by line-of-sight restrictions of optical scanning methods
- Visualization and qualification of porosity
- Assembly visualization while assembly is under actual stressed, assembled condition



*Aerospace fuel bodies with internal passages and complex geometry*



*Fossilized tyrannosaurus egg being scanned for possible fetal development*



*Composite parts used in aerospace applications, where porosity and voids can have catastrophic consequences*

## Finding Assembly Failures without Dismantling Assemblies

Often, dismantling of failed assemblies destroys or distorts the cause of failure. Advanced CT scanning can all but eliminate the difficulty of troubleshooting such assemblies by using x-rays to differentiate and segment individual components. The technology enables our engineers to

“see” inside the assembly of parts and identify such areas as faulty wiring, bent or misaligned parts and other failure conditions that would or could cause issues. In fact, our engineers can achieve this insight without taking the assembly out of its original box or retail packaging!

**3D Engineering Solutions—Endless Possibilities through Advanced Technology**



**ENGINEERING SOLUTIONS**  
MEASURING AND MODELING QUALITY



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