VARIAN
medical systems

SECURITY & INSPECTION
PRODUCTS

CT Inspection Services

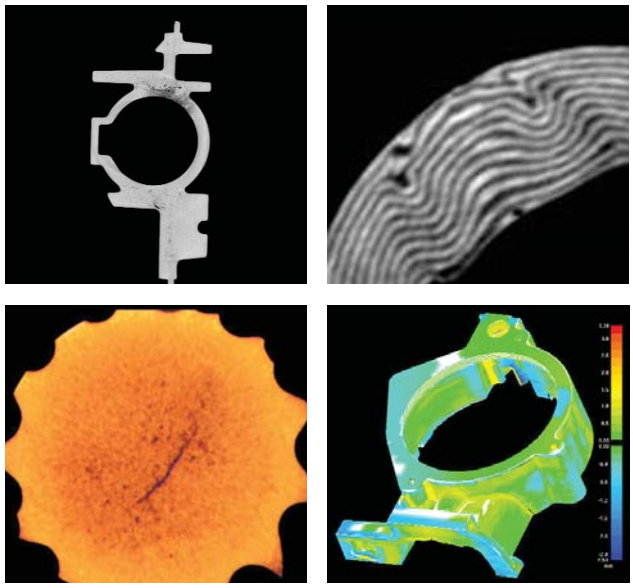
Varian's X-ray computed tomography (CT) inspection service center provides X-ray computed tomography services on a per-part or per-job basis. Our 225 kV microfocus and 450 kV standard focus systems serve the industrial CT inspection needs of automotive and aerospace companies, government agencies, forensic investigators, educational institutions and medical device manufacturers, to name a few.

Nondestructive Metrology

> Internal measurements
> Reverse engineering
> First-article inspection
> 3D volume analysis
> CAD comparison

Nondestructive Inspection

> Failure analysis
> Forensic analysis
> Porosity and voids
> Cracks
> Delamination
> Density variations
> Internal position and state



Nondestructive testing

Varian develops and manufactures industrial CT systems for a broad range of nondestructive testing and flaw detection applications. Some of these systems are also available on a service basis to assist design, quality, and forensic professionals in developing and improving product quality and reliability.

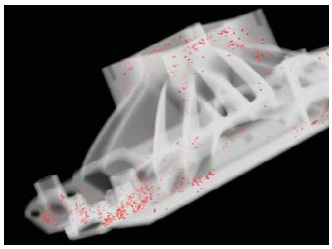
The slice images and 3D volume studies generated from industrial computed tomography help manufacturers improve processes; researchers study microstructures, investigators prove cases, and scientists unlock secrets.

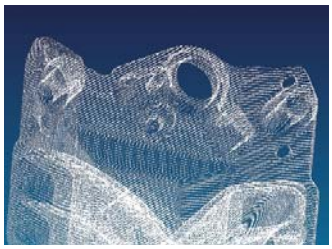
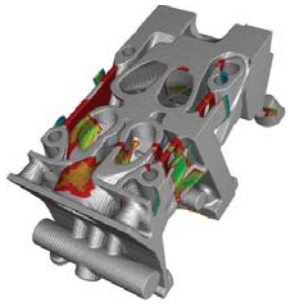
Metrology

X-ray CT is the only nondestructive means of obtaining internal geometric surface data. CT has become widely accepted for metrology applications in industries where the manufactured part contains complex internal geometry and destructive techniques are either cost prohibitive or impractical. Aluminum castings for automotive and aerospace applications are a prime example. They contain complex internal structures, and sectioning can often change the internal geometry. In other cases, the parts are quite costly, and destructive techniques are often avoided.

3D CT volume datasets can be imported into a growing list of high-powered software applications that are changing the way products are designed and manufactured.

Optimized image quality



Standard focus CT scanning services

Varian Inspection Services provides industrial CT services with a 450 kV standard focus system optimized for imaging large aluminum and magnesium castings (engine blocks and cylinder heads), catalytic converters, diesel engine particulate filters, aircraft components, medical implant devices, fossils and large asphalt, concrete, and earth cores.

The system provides both nondestructive inspection and measurements of aluminum and magnesium castings. It is similar to systems used by major automotive casting manufacturers for first article inspection and quality assurance of engine power train castings.

The system has a dual linear array detector for high capture efficiency at high energies and provides superior low-noise images making it ideal for metrology applications Typical pixel resolution is in the 300 to 400 micron range depending on the object size and material density. Measurement accuracy is a nominal 100 microns or greater depending on part size.

The system is also equipped with a Radiological Line Sensor (RLS) detector for imaging smaller objects (up to four inches in diameter) at high energies. The RLS captures internal surface data of high-density parts like jet engine turbine blades. Pixel resolution in the 100 to 120 micron range is achievable.

Typical standard focus applications:

- Automotive and aerospace castings
- Large ceramic particulate filters
- High-density medical implants
- Small steel components
- Large civil engineering and earth core

Microfocus imaging

Varian Inspection Services has high-resolution volume micro-CT capabilities for imaging microstructures and materials, measuring internal features of small industrial parts, and analyzing organic specimens. The system is equipped with a 225 kV microfocus X-ray source.

Microfocus CT is ideal for small light density material evaluation. Pixel resolution in the image ranges from 10 microns to 100 microns depending on object size.

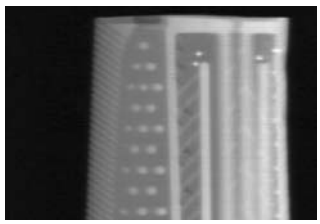
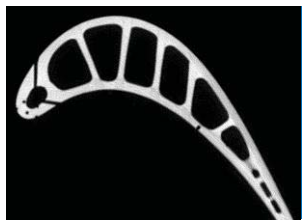
Typical microfocus applications include:

- Ceramic structure analysis
- Ceramic density analysis
- Li Ion battery analysis
- Medical implant structural analysis
- Porosity analysis
- Crack and void detection

CT file formats

The inherent image file format of Varian CT systems is 16-bit tagged image file format (TIFF). They can be viewed with a wide variety of TIFF image viewers for flaw detection and analyzing material characteristics.

Volume TIFF images can also be converted to binary STL files and imported into a wide and growing range of high-powered reverse engineering and finite element analysis (FEA) applications.

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Security & Inspection Products, Nevada
6883 Spencer Street,
Las Vegas, NV 89119
tel: 702.938.4859
fax: 702.938.4833
www.varian.com/sip
linatron@varian.com

Security & Inspection Products, Illinois
425 Barclay Boulevard,
Lincolnshire, IL 60069
tel: 847.279.5100
fax: 847.279.4900
www.birinc.com

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