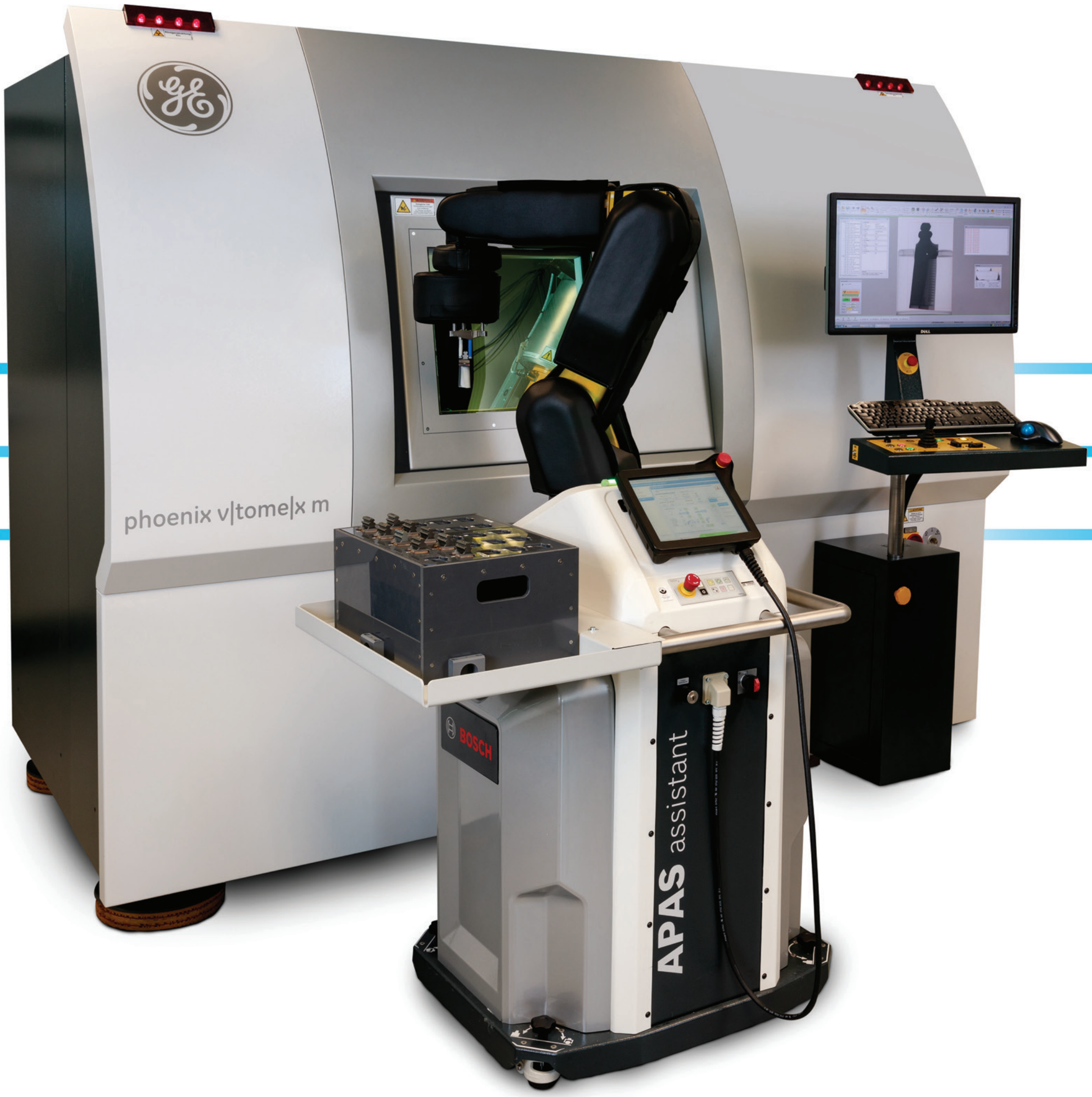
GE
Inspection Technologies

v|tome|x m microfocus CT

Uniting premium 3D metrology and inspection with quality and speed.



industrial.ai/CT

Inspect with precision, power, and productivity.

As manufacturing becomes more complex and automation becomes the norm, it's more important than ever to inspect with both precision and efficiency. GE is revolutionizing 3D inspection for non-destructive testing (NDT) and dimensional control to make these goals a reality.

By adapting CT technology for industrial needs and combining it with powerful X-ray technology, robotic manipulators, automated software, and proprietary GE CT technologies, we have created a family of high-precision CT products that reduce overall inspection times from hours to just minutes, at an extremely high quality level.

The new phoenix v|tome|x m pushes this innovation one step further to give you the most versatile and precise X-ray microfocus CT system for NDT and 3D metrology and analysis. This highly productive scanner delivers improved accuracy at unprecedented speeds—helping you dramatically optimize your lab processes to meet today's increasing demands.

Internal defect analysis

3D quantitative porosity analysis

Assembly control

Materials structure analysis for small high-absorbing castings

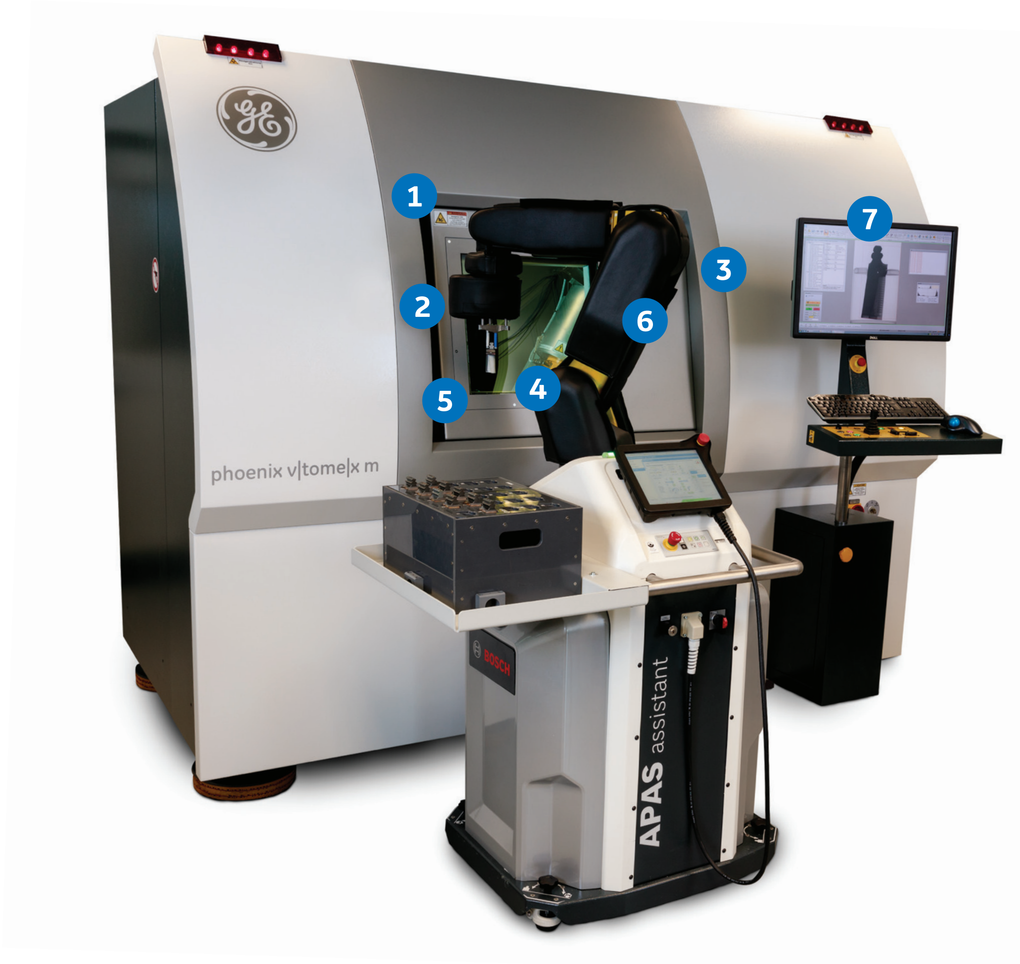
Precision 3D metrology

CAD Data nom/act comparison

Reduce scanning time without compromising quality.

The v|tome|x m is the first microCT system to harness GE's breakthrough scatter|correct technology, dynamic 41 digital detector, and high-flux|target—enabling high image quality as it scans much faster, or with improved accuracy, and truly revolutionizing inspection.

We offer several configurations and optional tools to help you achieve your production throughput goals with extreme accuracy. With new additions like the ruby|plate and true|position for improved measurement, workflows, and precision, as well as the helix|CT for improved image quality, you can increase probability of detection (POD) with efficiency and ease.



1. scatter|correct technology

Get unprecedented low artifact precision up to 100 times faster than with a comparable quality fan beam CT.

Drops scan time from 60 minutes to just 6.

2. dynamic 41 digital detector

Double CT resolution at the same speed, or double throughput at the same quality level as 200 µm pitch DXR detectors.

Drops 6 minute scan time down to 3.

3. high-flux|target

Improve efficiency with faster microCT scans or doubled resolution with higher power on a smaller focal spot.

Cuts the 3 minutes down to 1.5.

4. helix|CT

Scan with improved image quality to increase probability of detection (POD) with efficiency and ease.

5. offset|CT

Scan even larger parts with up to 100% larger scanning volume.

6. Fully automated robot

Maximize speed, accuracy, and reduce operational costs.

7. phoenix datos|x CT software

Fully automate your data acquisition, volume processing, and evaluation with ease.

*typical small high density object

Meet your specific microCT needs.

Whether you need to increase speed, detection detail, or do both, the phoenix v|tome|x m can be formatted for any 3D industrial or scientific microCT task. The first CT system worldwide, this versatile high-resolution scanner works with a variety of optional features to meet your high-quality inspection needs with up to two times faster inspections or scanning volume with up to 300kV/500W—all to help you make the most out of your inspections.

Industrial 3D NDT

Beyond high-resolution 3D analysis in R&D and failure analysis labs, this machine allows 3D production control with a powerful 300 kV tube and high dynamic detector technology for fast CT acquisition, fast velo|CT volume reconstruction, and a fully automated robot option. And with the offset|CT, you can scan even larger parts with up to 100% larger scanning volume.

- Internal defect analysis / 3D quantitative porosity analysis
- Assembly control
- Materials structure analysis

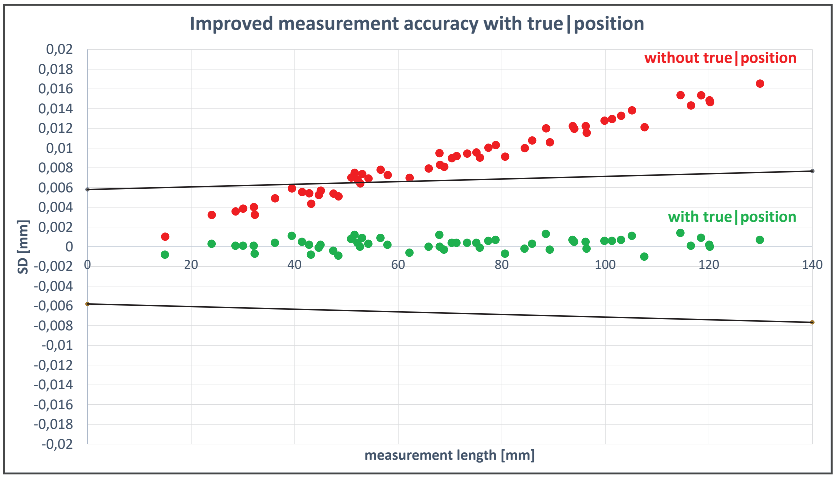
Research & Development innovation

With its high-resolution 180 kV nanoCT® option, the phoenix v|tome|x m opens a non-destructive third dimension for research & development down to the submicron scale—with no required preparation, slicing, coating or vacuum treatment.

Metrology 2.0

Reproducible precision 3D metrology with CT
3D CT offers big advantages over conventional tactile or optical coordinate measuring machines (CMM) — especially if there are complex parts with hidden or difficult surfaces. New true|position and ruby|plate technologies bring metrology workflows and precision to a new performance level. These allow improved VDI 2630 conform accuracy specification and three times faster performance verification of multiple positions. This is possible due to fully automated workflows, new ruby|plate calibration phantom (patent pending), and compensation of thermal drift effects by using temperature sensors.

- Nominal-actual CAD comparison
- Dimensional measurements / wall thickness analysis
- Reverse engineering / tool compensation
- 3.8 µm + L/100 referring to VDI 2630 guideline



Improve measurement methodology and accuracy.

GE's true|position expands the measurement positions with specified accuracy to all positions which can be verified with ruby|plate which allows a faster setup of CT scans with the extremely high measurement accuracy 3.8 µm + L/100 referring to both VDI 2630 guideline and remarkable 5.8 µm + L/50 for all other positions.

Automate your entire CT process chain.

From loading, to scanning, to analysis, your entire inspection and measurement process can now be automated to increase efficiency and reproducibility.

The production|edition

With the optional production|edition configuration, you can fully automate your inspection. With a collaborative robot for automated sample loading, one operator can run several systems at once with less training. So you can quadruple operator productivity and save operational costs with high reproducibility, long-term stability, and high inspection throughput.

Fully automated CT

GE's CT datos|x automation software and its speed|ADR algorithms implemented in VGInline for makes metrology and failure analysis faster and easier than ever before. It allows you to fully automate data acquisition, volume processing, and evaluations like inspection reports, as well as to complete reproducible high-precision 3D metrology and failure analysis tasks with minimal operator training.

Improve reliability with real results

GE is always working to provide smarter inspections with the peace of mind of knowing you'll meet high accuracy and security standards. All main hardware and system software components are made with proprietary GE technology—combining durable hardware with high-quality results.

The v|tome|x m is designed for reproducibility with a temperature-stabilized X-ray tube and digital detector array and cabinet, as well as security with data integrity and long-term DICONDE data management.

General specifications

	phoenix v|tome|x s	phoenix v|tome|x m**
X-ray tube type	Open directional high-power microfocus X-ray tube, closed cooling water circuit. Optional additional (open) transmission high-power nanofocus X-ray tube	
Max. voltage / power	240 kV / 320 W	300 kV / 500 W. Alternatively available with 240 kV / 320 W microfocus X-ray tube
	dual|tube option for nanoCT®: additional 180 kV / 20 W high-power nanofocus tube with diamond|window | precision rotation unit with air bearings | easy tube exchange just by a push of a button	
Geometrical magnification (3D)	1.46 x to 100 x; up to 200 x with nanofocus tube	1.3 x to 100 x; up to 200 x with nanofocus tube
Detail detectability	Down to < 1 µm (microfocus tube); optional down to 0.2 µm (nanofocus tube)	
Min. voxel size	Down to 2 µm (microfocus tube)	Down to 2 µm (microfocus), opt. 1 µm with 41|100
	Optional down to <1 µm (nanofocus tube)	Optional down to <0.5 µm (nanofocus + dyn. 41|100)
Measurement accuracy	Not specified according to VDI 2630	3.8+L/100µm referring to VDI 2630-1.3 guideline* /**
Detector type (all according US ASTM E2597 standard)	Temperature stabilized digital GE DXR detector array, 200 µm pixel size, 1,000 x 1,000 pixels, 200 x 200 mm (8"), 2 x virtual detector enlargement	Temperature stabilized GE dynamic 41|200 large area detector with superior image and result quality, 410 x 410 mm (16" x 16"), 200 µm pixel size, 2036 x 2036 pixels (4 MP), extremely high dynamic range > 10000:1
	Optional 400 x 400 mm (16") large 4 MPixel DXR detector (without virtual detector enlargement)	Optional GE dynamic 41|100 detector 410 x 410 mm (16" x 16"), 100 µm pixel size, 4048 x 4048 pixels (16 MP) for doubled CT resolution
Manipulation	5-axes metal precision manipulator, optimized construction for high mechanical stability	Granite based precision 4-axes manipulator
Focus-detector-distance	800 mm (8" detector) | 930 mm (16" detector)	800 mm
Max. sample diameter x height	Max. 3D scan size up to 260 mm Ø x 420 mm, max. 400 mm Ø with opt. offset|CT and 8" detector	360 mm x 600 mm; up to 500 x 600 mm with limited travel range, max. 3D scan size up to 420 mm Ø x 400 mm
Max. sample weight	10 kg (22 lbs.)	50 kg (110 lbs.), high accuracy CT up to ~20 kg (44 lbs.)
Max. focus object distance	545 mm (microfocus tube)	600 mm (microfocus tube)
System dimensions W x H x D	2,170 mm x 1,690 mm x 1,500 mm (85.4" x 66.5" 59")	2,620 mm x 2,060 mm x 1,570 mm (103" x 81" x 62"); D 2,980 mm (117.3") with user panel and generators
System weight	Appr. 2,900 kg /6,400 lbs. (without ext. components)	Appr. 7,960 kg /17,550 lbs. (without ext. components)
Temperature stabilization	Active X-ray tube cooling | temperature stabilized detector	Active X-ray tube cooling | temperature controlled cabinet | temperature stabilized detector
Optional patented scatter|correct hard-/software bundle (also upgrade option)		CT quality like 2D fan beam CT with minimized scatter radiation artifacts. Max. scan diameter: 260 mm, geom. magnification 1,51x - 100x
Optional high-flux|target	2 times faster CT scans or doubled resolution; X-ray inspection power up to 100 W	
Opt. 2D inspection bundle	Tilt and rotation axes for tilted 2D inspection of samples up to 10 kg (22 lbs.) | 2D inspection software	
Opt. metrology|edition** (also upgrade option)	phoenix datos|x CT software package "metrology"	
	2 calibration objects	The patented ruby | plate allows for 3x faster, automated verification of the specified measurement accuracy referring to VDI 2630-1.3 guideline* probed with ruby|plate phantom, which has a longest measurement length of 130 mm. This allows for a faster setup of CT scans with higher measurement accuracy.
Opt. helix|CT & offset|CT	Advanced scanning trajectories for improved scanning volume and data quality: helix|CT for long part scans with less artifacts and better quality, offset|CT to scan bigger parts or same size with higher resolution	
Opt. click&measure|CT	Optional fully automated CT process chain	included
Opt. production|edition		Fully automated with collaborative robot on request
Software	phoenix datos|x 3D computed tomography acquisition and reconstruction software. Different 3D evaluation software packages for 3D metrology, failure or structure analysis on request	
Radiation protection	The radiation safety cabinet is a full protective installation without type approval according to German RöV. It complies with French NFC 74 100 and the US Performance Standard 21 CFR Subchapter J. For operation, other official licenses may be necessary.	

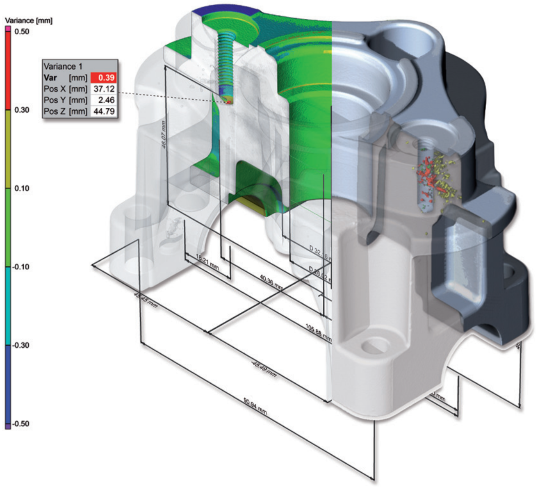
---

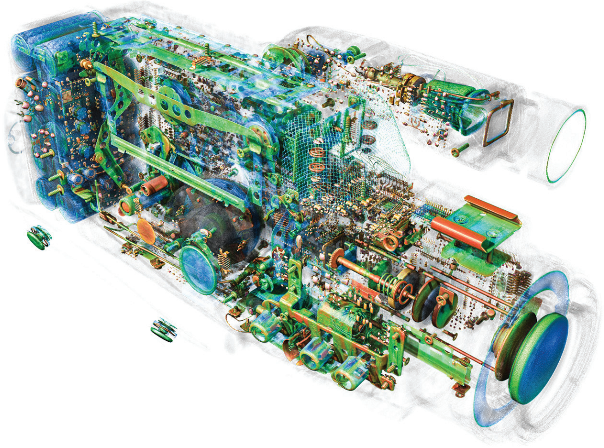
* Measured as deviation of sphere distance in tomographic static mode SD(TS) with true|position and ruby|plate (available Sept. 2018), method details referring to VDI 2630-1.3 guideline on request, valid only for phoenix v|tome|x m metrology|edition

** phoenix v|tome|x m metrology|edition only available in specific countries at present, more information on request

A partnership for improved performance.

The premium CT performance of the v|tome|x m is just one example of how GE is revolutionizing CT inspection to make manufacturing processes more efficient. With our entire x|series precision CT line, a variety of optional innovations, and expert service, we are committed to enhancing precision, automation, and productivity for your operations through GE's global service network.





GE Sensing & Inspection Technologies GmbH
phoenix|x-ray
Niels-Bohr-Str. 7 31515 Wunstorf, Germany
Tel.: +49 5031 172 100
Fax: +49 5031 172 299
E-mail: phoenix-info@ge.com

GE Sensing & Inspection Technologies
11988 Tramway Dr, Cincinnati, OH 45241, USA
Tel.: 1 844 991 0474
E-mail: phoenix-usa@ge.com

GEIT-31319EN (05/2019)