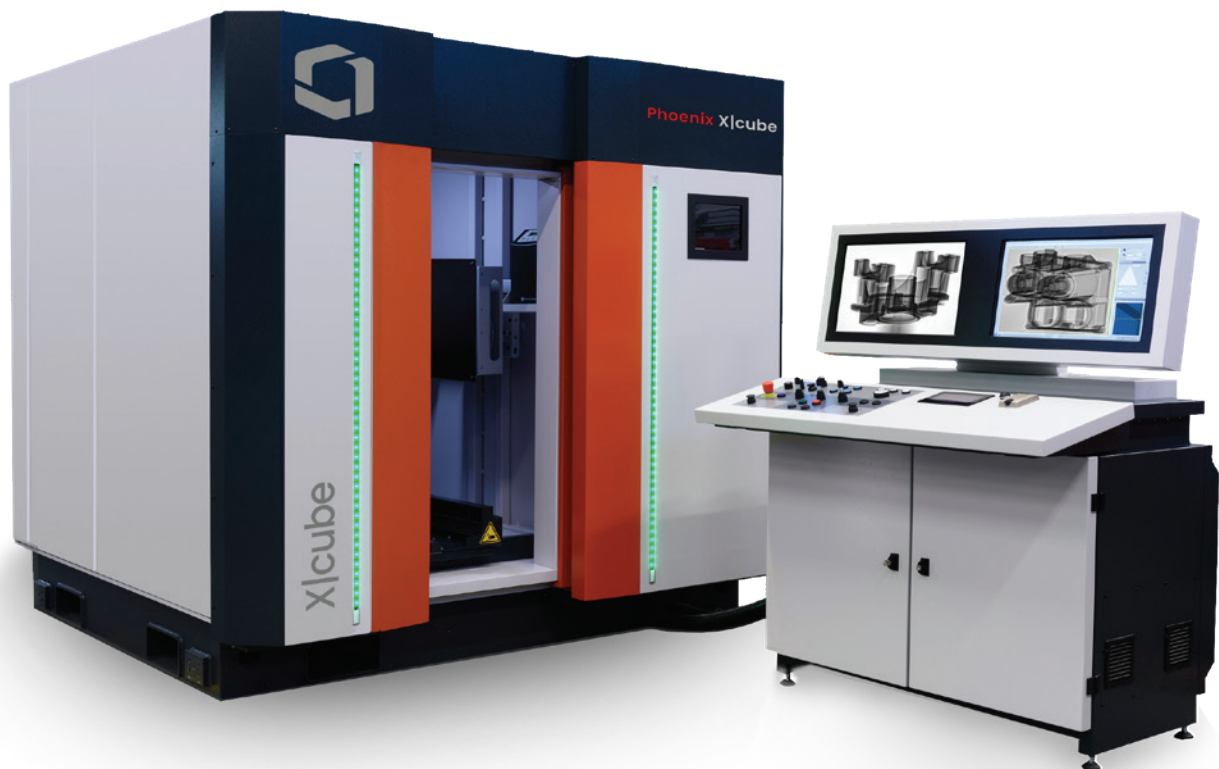


# Phoenix X|cube series

Versatile 2D and 3D X-ray system built for speed.



# Key features & benefits.

- Flexible and reliable solution to safely improve efficiency (uptime, costs, productivity, quality) across operations for all industries (Aerospace, Automotive, etc.) within different process steps of production, incoming inspection, to failure analysis, research and development
- Optimized for a wide variety of parts and highest speed for 2D inspections and with option to use 3D inspection (CT)
- High throughputs for unrivaled image quality complies with industry standards like ASTM and DICONDE
- Simple loading with extractable parts manipulator for parts weighing up to max. 150 kg
- Available with high penetration power of 320 kV for samples up to max. 300 kg
- Max. sample size 600 x 900 mm (800 x 1500 mm with Phoenix X|cube XL)
- Patented extremely low vibration C arm manipulator, flexible swivel angle of +45° to -45°

# Inspect a wider range at a higher speed.

Both the Phoenix X|cube Compact and the Phoenix X|cube XL ensure fast, easy and effective non-destructive testing (NDT) that will take your inspections to the next level. With a new easy-to-use design, highly dynamic detectors that display the finest contrast images and optional 3D Computed Tomography capabilities, you can detect hidden defects early-on and make important production decisions faster than ever.



## Applications

- Light metal castings
- Plastics / composites
- Special alloys
- Ceramics
- Steel components
- Additive manufactured parts

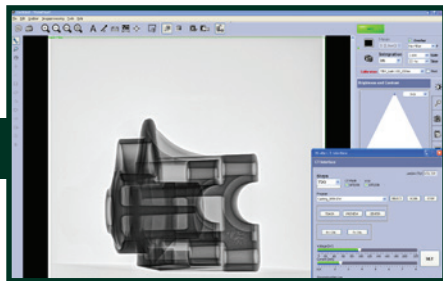
# Determine the shape, position and size of defects in 3D.

The X|cube system extends beyond 2D X-ray inspection with a full computed tomography (CT) option. CT enables this versatile system to perform 3D analysis and process control with volume data from virtual, non-destructive slicing of parts in instances when traditional 2D radiography is unable to provide clear results.

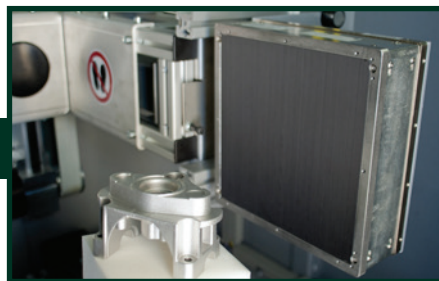
## Key features & benefits

- Easy to set up and use
- Allowing you to improve detection and classification
- Feature detailed 3D inspections, e.g. quantitative porosity analysis, measure internal wall thickness
- Reduce rejection rates and increase the accuracy of failure detection - right on the production floor

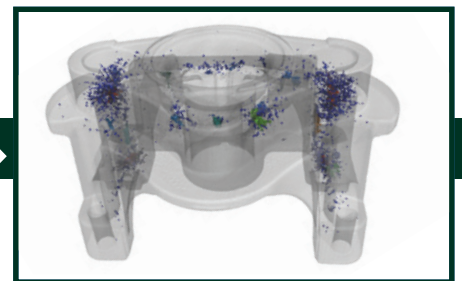
## How 3D CT inspections work



With our intuitive software it takes just a few clicks to set up the CT scan.



While the workpiece rotates in the X-ray beam, the extremely fast flat panel detector captures a series of 2D radiographic images.



The reconstructed volume is automatically opened for the 3D analysis and enables, e.g., any virtual sections and quantitative pore analysis.



# Reliable Inspection starts here. Faster, easier and more flexible.



## FAST

Keep up with growing demands while still achieving the highest result quality with fast set-up, short cycle times, reliable inspection tools like optimized Flash!Filters™, as well as optional semi-automatic defect recognition (ADR) and ASTM tools.



## EASY

Reduce human error and influence, while increasing repeatability and reproducibility by set up inspection routines within seconds with teach and learn function.. With easy teach and learn inspection routines, part-specific inspection routines for 2D radiography and 3D CT scans, software features like ASTM reference image catalogues, Semi-ADR and Flash!Filter™ tools, operators are able to make reliable inspection decisions.



## FLEXIBLE

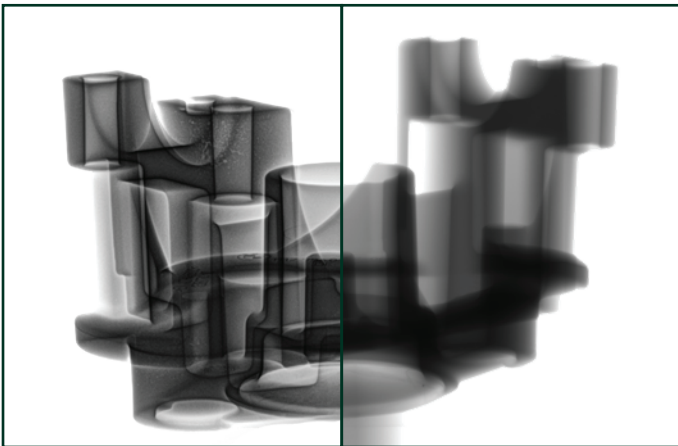
Meet a wide inspection range with a variety of different system sizes, while extending system life with software, CT and detector upgrades.

## The X|cube series goes even further to streamline your operations with improved versatile features like

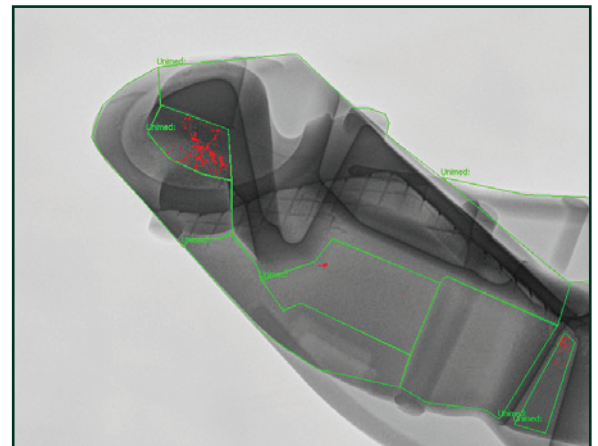
- A durable design to protect against harsh environments
- Strengthened safety with an additional door bumper
- Improved serviceability and less maintenance effort (e.g. based on maintenance-free high voltage connection)
- Part manipulator with automated moveout, higher payload
- Variety of high-dynamic detectors in different sizes and resolutions
- Software assistance tools to support reliable inspection

# Flexible solution for emerging needs and quality standards.

The world of manufacturing is evolving faster than ever. To keep up with shifting inspection guidelines, users need flexible solutions. With software and hardware upgrades you are prepared for growing demands.



Flash!Filters™ optimized      Conventional radiography



Semi-ADR feature

## See more with Flash!Filters™

The X|cube utilizes our groundbreaking Flash!Filter™ technology that gives you incomparable inspection results optimized for human eyes. This clearer imagery minimizes failure detection time, while increasing failure detection rate in both casting and welding inspections.

## Ensure compliance with international NDE standards

Meet even the most stringent industry standards. Equipped with optional semi-automatic defect recognition (ADR), the X|cube can efficiently evaluate casting defect sizes. You can connect to our Rhythm software right from your X|cube for DICOM compliant digital image analysis and data management — including descriptions of all necessary syntax, attributes and data elements.

# General specifications

	Phoenix X cube Compact			Phoenix X cube XL	
Energy (max.)	160 kV	225 kV	320 kV	160 kV	225 kV
Max. sample size (Ø x height in mm)	600 x 900 **	600 x 900 **	600 x 900 **	800 x 1500**	800 x 1500**
Max. loading part height	1150 mm	1150 mm	930 mm	1585 mm	1585 mm
Max. sample weight	150 kg *	150 kg *	300 kg *	150 kg *	150 kg *
Cabinet dimensions (L x W x H in mm)	2650 x 2155 x 2360	2650 x 2155 x 2360	2540 x 2230 x 2400	2850 x 2155 x 2885	2850 x 2155 x 2885
Cabinet weight approx.	5350 kg	5350 kg	10500 kg	6600 kg	6600 kg
Control panel weight approx.	350 kg				
Manipulation Travel					
Max. horizontal motion across the X-ray beam	650 mm		660 mm	850 mm	
Max. external loading/unloading position	90 mm		150 mm	90 mm	
Max. horizontal motion magnification axis	850 mm		620 mm	1050 mm	
Focus detector distance (FDD), depends on detector type	800 - 1000 mm		800 - 1150 mm	1000 - 1200 mm	
Max. vertical motion	900 mm		950 mm	1500 mm	
Max. tilt of the C arm	± 45°				
Max. sample rotation	n x 360°				
2D software	Integrated image optimization system VISTAPLUS supports live image display and real-time capabilities with dedicated detectors				
System control	X touch panel operation allows for fast and easy set-up of inspection routines by teach and learn procedures				
Control / Drives	Hardware PLC for PC independent servo drives				
Detector options	Selection of various digital flat panel detectors, including temperature-stabilized highly dynamic DXR 250RT digital detector for real-time inspection and very fast CT scans, the DXR 500L detector for particularly high-resolution applications, and the DXR 250 for a large active area				
Flash!Filters™ option	Proprietary live image optimization technology for easier visual defect detection in castings or weldings				
Tube options	Various mini and macro focuses, as well as various high-power X-ray tubes				
Software options	EZ Compare with ASTM reference image catalogue, semi-ADR for semi automatic defect recognition (pass/fail final decision by operator), Rhythm Export Module with DICONDE file export to the Rhythm Platform and automatic ASTM image quality evaluation				
Computed tomography add-on	CT package contains all the required hardware and software components for combined 2D/3D operation with our detectors				
CT scan range	Max. 160 mm Ø x 160 mm height at DXR 250RT 8"x 8" detector				
Min. voxel size	Up to 100 µm, depending on the sample size and detector pixel pitch				
Connection values / capacity	3N PE 400/230V 50/60 Hz, 35 A (160+225 kV), 50 A (320 kV), TN-S or TN-CS network / up to approx. 16 kVA***				
Earthing	Separate earthing for X-ray device and high-voltage generator with at least 6 mm <sup>2</sup> (< 2 Ω)				
Means of transport	Complete X-ray protection cabinet with fork lift truck / Control panel (on pallet) with fork lift truck				
Ambient conditions (in accordance with IEC 60601-1)	Ambient temperature +10° C to +40° C, air pressure 700 hPa to 1060 hPa, humidity during operation 25 to 85% non-condensing				
Compliant with national & international standards	ISO 9001; VDE 0100; UVV; DIN EN 60204 (VDE 0113); VBG; German Radiation Control Act (StrSchG) of 2017 (with amendments in the current version); DIN EN ISO 13849-1; CFR 1020.40; DIN 54113-1				
Radiation protection	Radiation safety cabinet for full protective installation without type approval according to German StrSchG/StrSchV. French NFC 74 100 and the US Performance Standard 21 CFR Subchapter J are coming soon. For operation, other official licenses may be necessary.				

\* Depends on the loading position.

\*\* Longer workpieces are possible, this involves the workpiece being reloaded and inspected.

\*\*\* Depends on the applied X-ray tube

**Note:** The inspection volume that can be X-rayed varies according to the total wall thickness and the material density.

# A partnership for improved performance.

The Phoenix X|cube series is just one example of how Waygate Technologies is revolutionizing digital inspection to make manufacturing processes more efficient. With our entire X-ray and CT product family, a variety of optional innovations, and expert service, we are committed to enhancing precision, automation and productivity for your operations.



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**Baker Hughes** 