PHOTONIC
SCIENCE

2D Micro Radiography System

High-resolution | Rapid Imaging | Turnkey Solution

Industrial & Scientific Configurations

PRECISOMETER
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PHOTONIC SCIENCE

Introducing our state-of-the-art, flexible 2D Micro Radiography System, where Photonic Sciences' industry-leading X-ray cameras deliver exceptional resolution at a microscopic level.

With over 20 years of expertise in X-ray system design, we specialise in customising solutions to meet your unique needs.

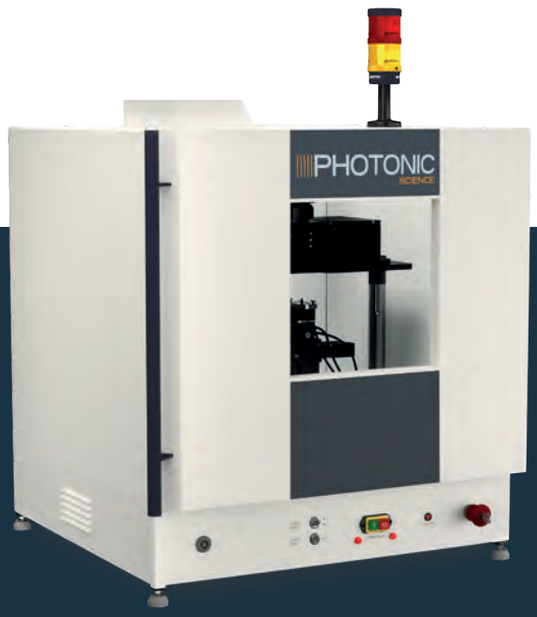
Our system is ideal for diverse applications, including medical R&D, non-destructive testing, archaeology, material science, electronics, and forensics.

We offer two standard products to serve as the foundation for your custom X-ray imaging platform:

For those requiring minute details, our **High-Resolution** system, featuring a dedicated microfocus X-ray source, can resolve features as small as 3 µm.

For applications requiring exposures below 1 sec, active areas up to 95 mm diagonally and 30 µm resolution at the object, our **Rapid Imaging** system employs a powerful 50W minifocus X-ray source, enabling near 1:1 rapid high resolution imaging.





High-Resolution

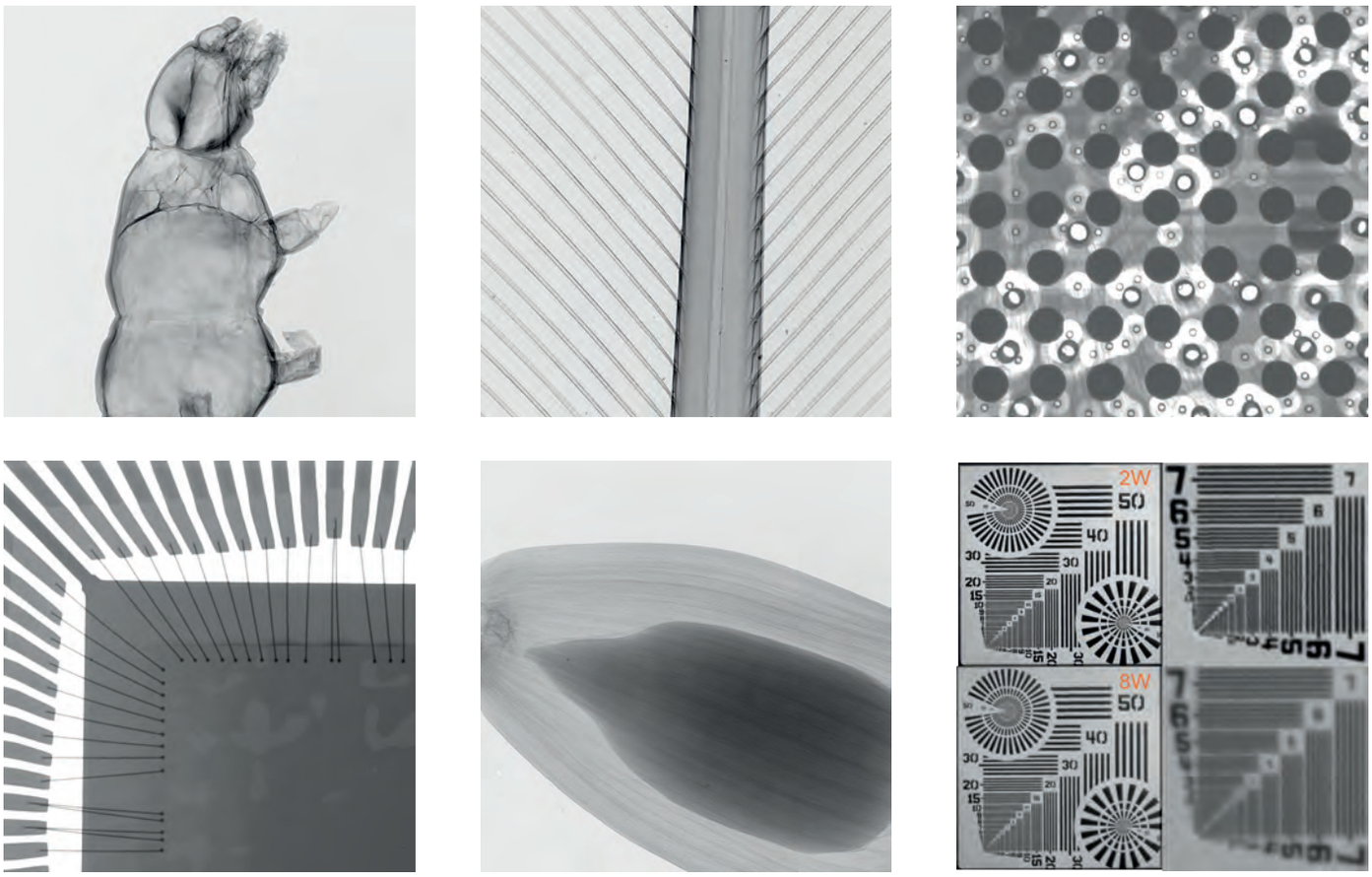
- **60 kVp**
- **Microfocus x-ray source**
- **3 to 5 µm resolution at the target**
- **5 to 10x magnification range**
- **~2 sec typical exposure time** (sample dependent)
- **Fully self-shielded benchtop cabinet**
  694mm W x 782mm D x 1200mm H

Rapid Imaging

- **50 kVp**
- **Minifocus x-ray source**
- **30 µm resolution at the target**
- **1:1 imaging**
- **>1 sec typical exposure time** (sample dependent)
- **Fully self-shielded benchtop cabinet**
  694mm W x 782mm D x 800mm H

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2D radiography images from various samples taken at 60 kVp and 2s exposure, including a meal-worm head, PLD boards, and a resolution chart.

Applications

Biological R&D

Invertebrate/insect imaging
Bone and joint imaging
Dental imaging

Non-Destructive Testing (NDT)

Industrial Inspection: for examing the integrity of materials and structures, such as castings and composite materials, without causing damage.

Agriculture

Seed inspection

Archaeology and Paleontology

Artifact Examination: non-invasive analysis of artifacts to understand composition, structure, and internal features.

Fossil Imaging: Studying fossils encased in rock without damage.

Material Science

Microstructure Analysis: investigating the microstructure of various materials, including metals, ceramics, and composites.

Thin Film Studies: analysing the properties and structure of thin films used in electronics and coatings.

Electronics

PCB Inspection: checking printed circuit boards (PCBs) for defects, solder joint integrity, and component placement.

Semiconductor Analysis: inspecting the internal structure of semiconductor devices to ensure quality and functionality.

Forensics

Document Examination: analysing documents for authenticity and detecting alternations or forgeries.

Evidence Analysis: non-invasive examination of physical evidence to uncover hidden details.

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Base System

- **Plug-n-play Air Cooled X-ray Source**
- **Sample Mount**
  with 4-way movement (tilt, X, Y, Z)
- **Imaging Camera**
  Photonic Science sCMOS X-ray Camera
- **Fixed Focus Visual Camera**
- **Windows 11 PC and monitor**
- **Software Suite**
- **Table**

Upgrade Options

- **Goniometer**
- **Translation Stages**

Sample translation

Possibility for manual and motorised stages for sample translation in X, Y and Z and rotation with up to three degrees of freedom. Translation allows for measuring large sample areas or multiple small samples, and can be automated with motorised stages. A typical translation range is 50 mm (X) by 50 mm (Y) but can be extended upon request.

Software suite

Photonic Science PsViewer hardware control and image capture software:

- Post-processing and image corrections
- Image capture with exposure times from 60ms (with camera operated in 2x2 binning) to minutes, and frame averaging
- X-ray Source control
- Motorised Stage control

Features & Benefits

- ✓ **Complete System**
  Fully integrated, with table, for plug-n-play operation - no additional room preparation or services required
- ✓ **Fixed Focus Visual Camera**
  Aids in aligning the sample to the X-ray beam and selecting desired imaging area
- ✓ **Motorised Sample Mount**
  Automated sample scanning and positioning
- ✓ **sCMOS X-ray Camera**
  Active area up to 65.5 x 65.5 mm, down to 25 µm resolution, and 58% peak QE
- ✓ **Air Cooled Source**
  Low maintenance, low cost, and low power requirements - run off a standard plug
- ✓ **Targeted magnification**
  1x to 10x variable magnification option for versatile systems which need flexible resolution
- ✓ **X-ray Safety**
  Warning lights, x-ray beacons, and interlocks conforming to Health & Safety Standards
- ✓ **On-site/Remote Install and Training**

System Specifications

Key Specifications	High-Resolution System	Rapid Imaging System
Resolution at the target	3 µm at 2.5W with 5x magnification 5 µm at 8W with 5x magnification*	~30 µm
Magnification range	5x to 10x	~1:1
Area of illumination target	7.34 mm^2 at 5x magnification 3.67 mm^2 at 10x magnification	~36.7 mm^2 or ~65.5 mm^2
Typical exposure time (sample dependent)	~2 sec	>1 sec

* *Resolution with high-contrast samples. Specifications are subject to change without notice.*

Detector Specifications*	High-Resolution System	Rapid Imaging System
Number of Pixels	4096 x 4096	4096 x 4096
FOV	36.7 x 36.7 mm	36.7 x 36.7 mm or 65.5 x 65.5 mm
Effective Pixel Size	9 µm x 9 µm	9 µm x 9 µm or 14.1 µm x 14.1 µm
Dynamic Range	12000:1 with all corrections	
Frame Rate	4.5 fps at full sensor resolution; 18 fps at half sensor resolution	
Full Well Capacity	65000 to 70000 typical in mixed gain mode	
Read Out Noise	<5 electrons RMS at full sensor resolution and mixed gain mode <10 electrons RMS at half sensor resolution	
Dark Current	<1 electron/pixel/second air cooled with all corrections	
Digitisation	16-bit	
Peak QE	58% at scintillator emission wavelength (without microlens)	58% at scintillator emission wavelength
Exposure	50 microseconds up to 60 minutes	
Spatial Resolution	30 lp/mm	30 lp/mm or 20 lp/mm
Detector Interface	Gigabit Ethernet	
Energy Range	5 keV - 55 keV with Gadox:Tb	

* *Modifiable with our entire X-ray Camera product range*

X-ray Source	High-Resolution System	Rapid Imaging System
Power	8W	50W
Spot Size	5 µm at 8W	50 µm at 50W
Energy Range	20 - 60 kVp	
X-ray Beam Angle	40° round beam	
Target Material	Tungsten	
Cooling Method	Air-cooled	

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Installation

Video Installation

As a plug-n-play system, with no specialist requirements, install and setup is easy. Each 2D Micro Radiography System is delivered pre-configured with an installation video that takes you through the complete process step-by-step.

Our support team is available by phone or email to answer any questions you may have.

In-person Installation

Should a system require an in-person install, our service team will deliver and setup the 2D Micro Radiography System at your facility.

After Sales Services

Training

2D Micro Radiography Systems come with a comprehensive User Manual to guide users, both new and experienced, through all the features from setup to exposure.

Training videos are also available and a training session, via Teams or on site (location dependant), can be arranged.

Remote support

Our support team are on hand to help diagnose and troubleshoot problems to get your experiment back on-track.

Quality Assurance

Quality and continuous improvement is at the heart of everything we do at Photonic Science, to ensure we deliver on-spec systems every time.

Photonic Science is an ISO9001 qualified company and as standard we provide a 12 month warranty on all our products; with warranty extensions available on request.

We also provide after sales support, including maintenance and repairs, for all Photonic Science cameras, software, and systems.

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Part of Tibidabo Scientific Industries

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bsi. ISO 9001 Quality Management

PRECISOMETER

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Product selection, configuration & integration support

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Explore products & discuss your experiment