



Introducing the world's most advanced radiation imaging solution

Fast, 360° × 90° gamma-ray imaging across the full energy range, for improved decision making





Precision data For intelligent decision making

To keep workers safe, it is critical to identify and locate sources of radiation quickly and accurately.

ANSTO's new platform imaging technology CORIS360[®], makes the invisible, visible, by identifying and imaging the exact location of radiation sources.

Using compressed sensing techniques, CORIS360[®] quickly produces precise high quality images.

With a 360° × 90° field of view, CORIS360[®] delivers improved operational decision making for anyone working in radioactive environments and helps to keep workers safe.





CORIS360[®] Delivers value

Better data improves decision making for anyone working in radioactive environments.



Intelligent

Optimised sampling to identify and localise radiation sources



Fast

Compressed sensing delivers faster results



Full energy range

Image across the full energy range Ability to detect neutrons



Precision

Better data for improved decision making



Safe

Remote operation reduces worker exposure



User-friendly

Easy to interpret and versatile with customisable detectors



Large field of view

See more in one acquisition



Cost effective

Faster imaging saves time and resources

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How CORIS360® Works

Compressed sensing – a new approach delivers faster results

The CORIS360[®] platform imaging technology uses the theory of compressed sensing. Traditional imaging is based on the sampling of uniform discrete elements (pixels) in the entire image field of view. This is how the millions of camera pixels take pictures on our mobile phones. As these optical image files are large, they are normally compressed into the JPEG format, before sharing.

This compressed JPEG image contains all the important image information but is only a fraction of the original file size. The useful information is a small fraction of the measured information. Imagine the benefits of only measuring the useful information.

This is how the compressed sensing technique works. It can directly acquire images in a compressed format, rather than measuring the whole data set and then compressing.

CORIS360® can directly acquire data in a compressed format rather than measuring the whole data set and then compressing.



Scan-Compressed data collection



Original camera file- *Uncompressed* 26.9MB



JPEG file- *Compressed* 690 KB

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The compressed JPEG image on the right contains all the important image information but is only a fraction (690KB) of the original file size (26.9MB).



Overlay- Output



Key CORIS360° Benefits

Better data for improved operational decision making in radioactive environments

High quality images with up to 10 times fewer samples than traditional methods, delivering significant savings in time, money and resources

Overlaying a wide 360° × 90° radiation image onto a panoramic optical image in a single acquisition, makes interpretation easy

Accurate visualisation and identification of isotope specific, and scattered, sources of radiation across a broad energy range enable a greater understanding of work environments Imaging of multiple point sources as well as extended sources

User friendly, portable and versatile system which can be configured for different dose rate environments

Remotely operated to keep workers safe







Field of view

Unparalleled scene visualisation with 360° horizontal and 90° vertical FOV



Imaging the full energy range over a large FOV

High dose environments

Imaging of low and high dose rate environments





Key CORIS360[®] **Features**

LARGE FIELD OF VIEW

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Unprecedented scene visualisation with a 360° optical and gamma field of view

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Simultaneous imaging of multiple radionuclides over a broad energy range 40 keV - 3 MeV



Wide field of view $360^{\circ} \times 90^{\circ}$

FAST, PRECISE IMAGING



EASY TO USE



Plug and play detector modules provide optimised operation for low to high dose rate environments

Easy to set up ready to use in 2 minutes

User-friendly with an intuitive interface

Compact, portable design and well suited for indoor



CORIS360[®] **Applications**

By accurately imaging radiation across the full energy range, CORIS360® delivers operational benefits for many industry applications.









First responders







Safeguards



CORIS360[®] Specifications

CORIS360[®] System

0	CORIS360 [®] Imager
ß	CORIS360 [®] Imaging and processing software
Ā	Tripod
F--F--F-	Ruggedised carry case
	Two detectors
٦Ĵ	Power and data cables
Ţ	¹⁵² Eu calibration puck
F	Hex key

Dimensions	210 mm × 425 mm (D × H) 8.3" × 16.8" (D × H)	Imaging region of interest	Peaks and
Weight	21.5 kg 47.5 lbs	Gamma field of view	360°×90°
Power supply	100 VAC - 240 VAC (47 Hz - 63 Hz) Input	Optical field of view	360° × 90°
Operating temperature	5°C - 40°C (Ambient) 41°F - 104°F (Ambient)	Max. angular resolution	21°±1°
Storage temperature	5 °C - 40 °C (Ambient) 41°F - 104°F (Ambient)	Dose rate range	0.5 μSv/h 1 μSv/h - 4
Detector type/s	Cylindrical Ø1.5" CLLBC Scintillator with SiPM array Cubic 0.5" CLLBC Scintillator with SiPM array	Radionuclide	Customis
Energy resolution	~4% FWHM @ 662 keV	Start-up time	1 minute
Energy range	40 keV - >3 MeV Gamma and Thermal Neutron Detection	Communication	Ethernet



and non-peaks

90° (H × V)

90° (H × V)

v/h - 2 mSv/h for 137 Cs (1.5" detector) 'h - 40 mSv/h for 137 Cs (0.5" detector)

misable library of radioisotopes included

net connected to PC/laptop



CORIS360[®] Case study - Decommissioning

Nuclear Decommissioning: 360° image of the High Flux Australian Reactor (HIFAR) plant room showing the location of ⁶⁰Co in the top image and the scattered radiation in the lower image. Both images were generated from a single set of data.

HIFAR operated from 1958 to 2007.









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Setting a new standard in radiation imaging



TOTAL SPECTRUM





Cobalt-60 Radiation

Low energy scattered Radiation



CORIS360[®] Case study - Urban search

CORIS360[®] offers advantages to urban search scenarios. This 360[°] image localised the radiation source within the building.







CORIS360[®] Feedback

"Globally, there are over one hundred-sixty nuclear reactors retired from operation but not yet decommissioned. A fundamental requirement for decommissioning any nuclear reactor is the protection of workers and the community. To plan this safely requires a comprehensive radiological characterisation of the facility.

Having used CORIS360[®] in a major reactor characterisation project, I was impressed with its ability to operate in low and high dose environments, the large field of view and in particular the speed and quality of the acquisitions."

Con Lyras ANSTO Chief Engineer



"What would have taken about six months to accurately characterise and map the facility, instead was completed in six weeks. And it was done at a fifth of the cost of traditional surveying, saving us more than \$430,000."

Alec Kimber HIFAR Decommissioning, Project Lead







Contact us

Product by

For further information on CORIS360[®] including case studies and technical reports, please visit our website or contact us. WEBSITEwww.coris360.comEMAILcoris360@ansto.gov.auPHONE+61 2 9717 3311





Setting a new standard in radiation imaging

