

*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.



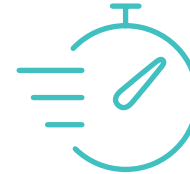
CORIS360[®] Delivers value

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



Intelligent

Optimised sampling to identify and localise radiation sources



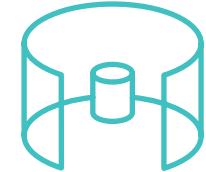
Fast

Compressed sensing delivers faster results



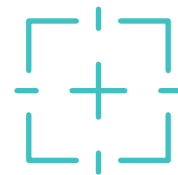
Full energy range

Image across the full energy range
Ability to detect neutrons



Large field of view

See more in one acquisition



Precision

Better data for improved decision making



Safe

Remote operation reduces worker exposure



User-friendly

Easy to interpret and versatile with customisable detectors



Cost effective

Faster imaging saves time and resources

How CORIS360® Works

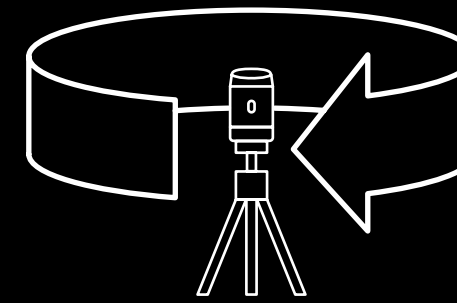
Compressed sensing – a new approach delivers faster results

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.

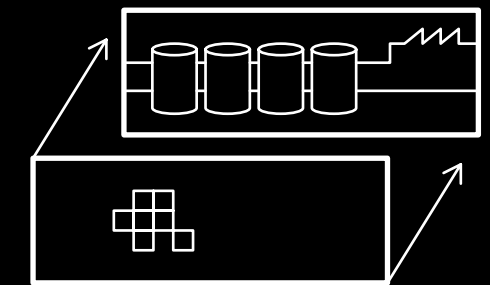
This compressed JPEG image contains all the important image information but is only a fraction of the original file size. The useful information is a small fraction of the measured information. Imagine the benefits of only measuring the useful information.

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.

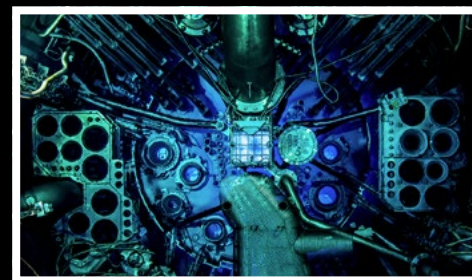
CORIS360® can directly acquire data in a compressed format rather than measuring the whole data set and then compressing.



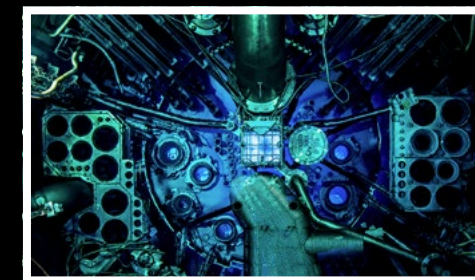
Scan - Compressed data collection



Overlay - Output



Original camera file- *Uncompressed*
26.9 MB



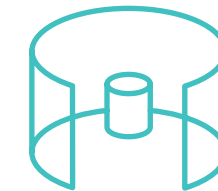
JPEG file- *Compressed*
690 KB

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).

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



Full energy range

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



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



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



Wide field of view 360° × 90°

FAST, PRECISE IMAGING



Spectroscopic detector to provide full spectral imaging



Rapid identification of sources



The ability to detect neutrons



High sensitivity max detector crystal volume of 44 cm³

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 and outdoor use



CORIS360[®] Applications

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



**Border protection
and national security**



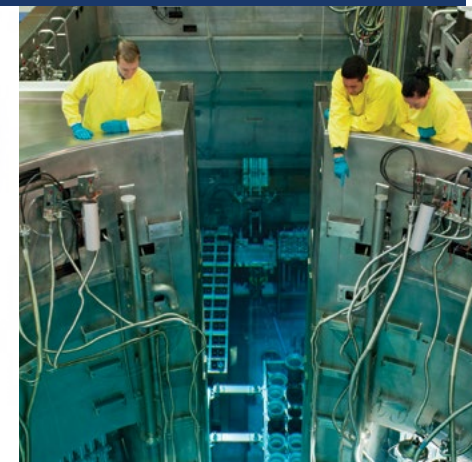
**Decommissioning
and decontamination**



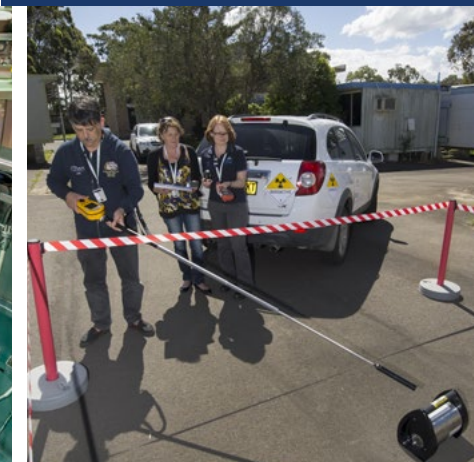
**Defence and
military**



First responders



**Nuclear reactor
operations**



**Radiation services
and health physics**











Safeguards

CORIS360[®]

Specifications

CORIS360[®] System

	CORIS360 [®] Imager
	CORIS360 [®] Imaging and processing software
	Tripod
	Ruggedised carry case
	Two detectors
	Power and data cables
	¹⁵² Eu calibration puck
	Hex key

Dimensions	210 mm × 425 mm (D × H) 8.3" × 16.8" (D × H)
Weight	21.5 kg 47.5 lbs
Power supply	100 VAC - 240 VAC (47 Hz - 63 Hz) Input
Operating temperature	5 °C - 40 °C (Ambient) 41°F - 104°F (Ambient)
Storage temperature	5 °C - 40 °C (Ambient) 41°F - 104°F (Ambient)
Detector type/s	Cylindrical Ø1.5" CLLBC Scintillator with SiPM array Cubic 0.5" CLLBC Scintillator with SiPM array
Energy resolution	~4% FWHM @ 662 keV
Energy range	40 keV - >3 MeV Gamma and Thermal Neutron Detection

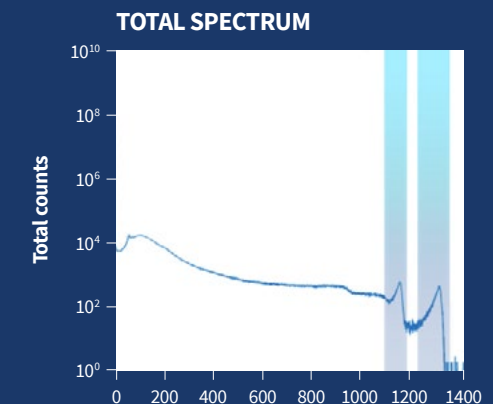
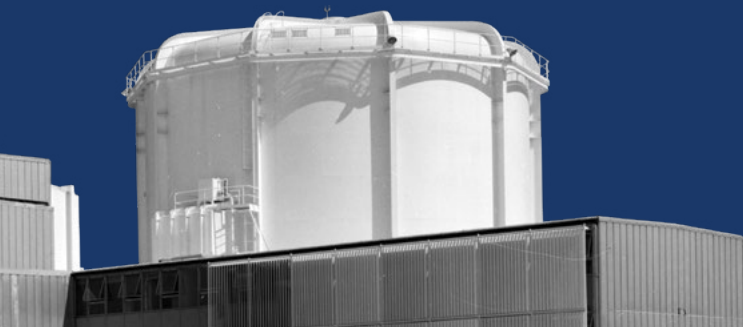
Imaging region of interest	Peaks and non-peaks
Gamma field of view	360° × 90° (H × V)
Optical field of view	360° × 90° (H × V)
Max. angular resolution	21° ± 1°
Dose rate range	0.5 µSv/h - 2 mSv/h for ¹³⁷ Cs (1.5" detector) 1 µSv/h - 40 mSv/h for ¹³⁷ Cs (0.5" detector)
Radionuclide identification	Customisable library of radioisotopes included
Start-up time	1 minute
Communication	Ethernet connected to PC/laptop

CORIS360[®]

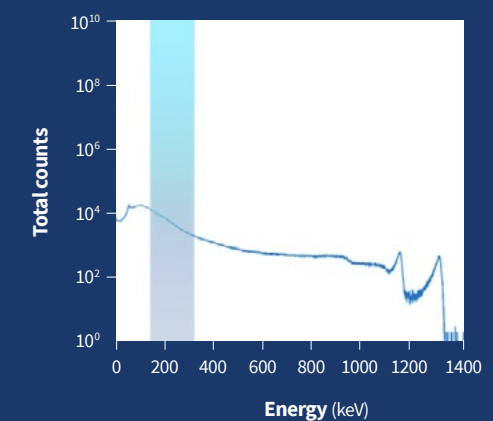
Case study - Decommissioning

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.



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

For further information on CORIS360® including case studies and technical reports, please visit our website or contact us.

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Product by



Australian Government

