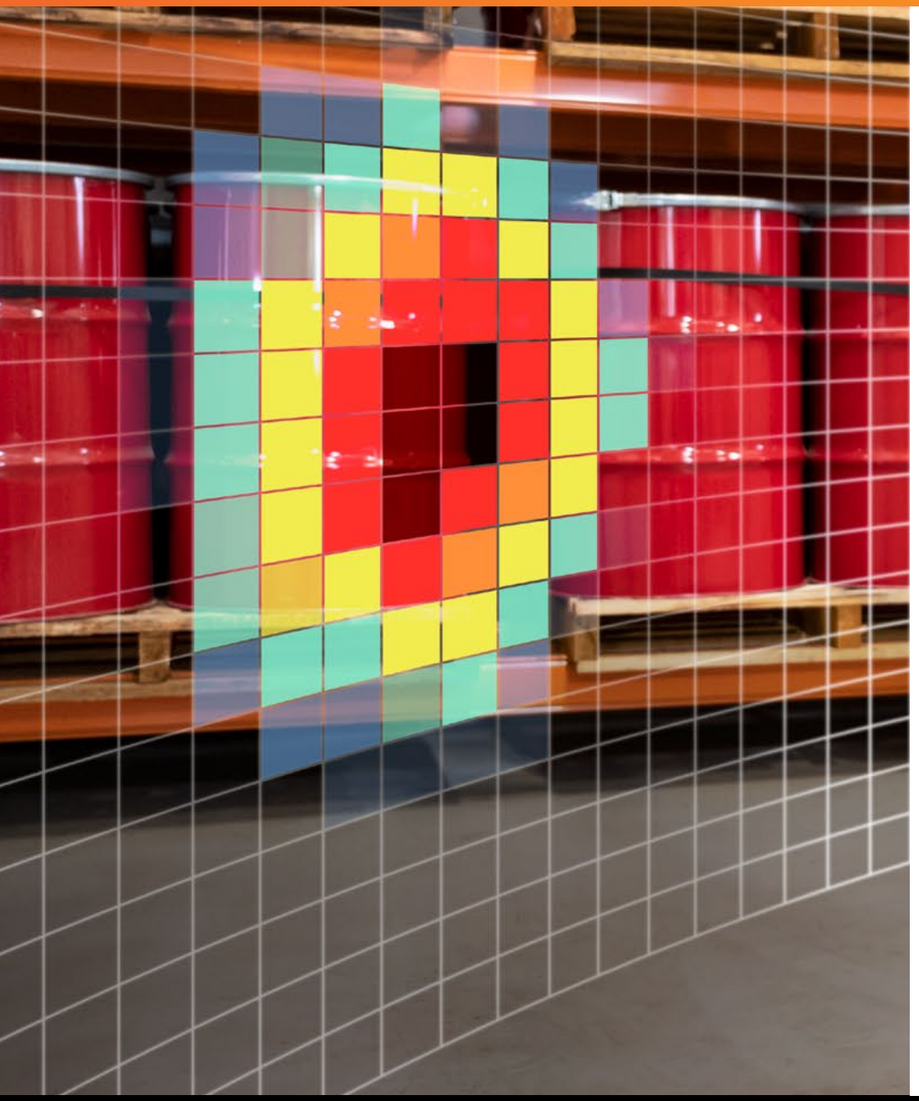


CORIS360™

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.

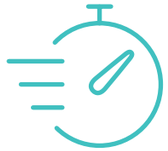
With a 360° × 90° field of view, CORIS360™ delivers improved operational decision making for anyone working in radioactive environments and helps to keep workers safe.

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

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

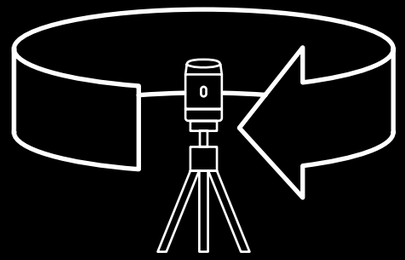
Compressed sensing – a new approach delivers faster results

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.

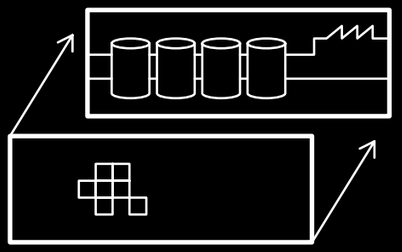
This compressed JPEG image contains all the important image information but is only a fraction of the original file size. The useful information is a small fraction of the measured information. Imagine the benefits of only measuring the useful information.

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.

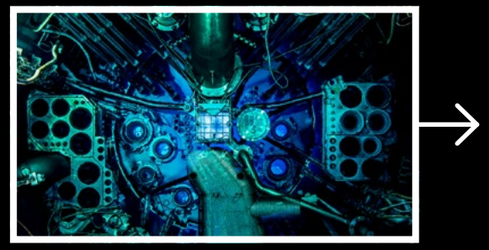
CORIS360™ can directly acquire data in a compressed format, rather than measuring the whole data set and then compressing.



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
- CORIS360™ acquires 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
- CORIS360™ enables the accurate visualisation and identification of isotope specific, and scattered, sources of radiation across a broad energy range to gain 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 cm^3

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

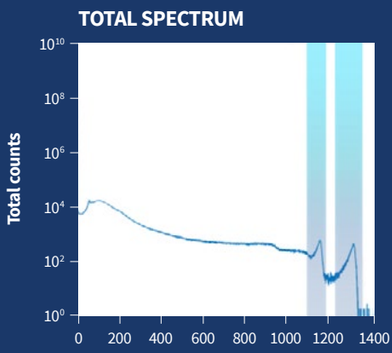
- CORIS360™ Imager
- CORIS360™ Imaging and processing software
- Tripod
- Ruggedised carry case
- Two detectors
- Power and accessory cables

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 Cube 0.5” CLLBC Scintillator with SiPM array
Energy resolution	< 4% FWHM @ 662 keV
Energy range	40 keV - 3 MeV Gamma and Thermal Neutron Detection

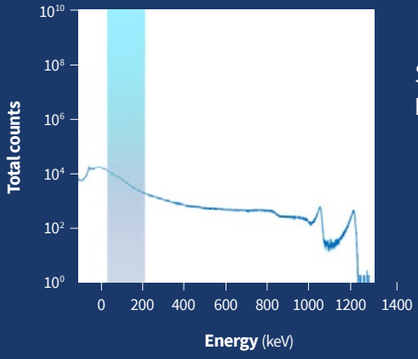
Imaging region of interest	Peaks and non-peaks
Gamma field of view	360° × 90° (H × V)
Optical field of view	360° × 90° (H × V)
Max. angular resolution	21° ± 1°
Dose rate range	0.5 µSv/h - 300 µSv/h (1.5” detector) 1 µSv/h - 2000 µSv/h (0.5” detector)
Radionuclide identification	Library of ~20 common 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 ^{60}Co in the top image and the scattered radiation in the lower image. Both images were generated from a single set of data.



Cobalt-60
Radiation



Low energy scattered
Radiation

HIFAR operated from 1958 to 2007.

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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Australian Government

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