

RAD IQ™ DI 1000

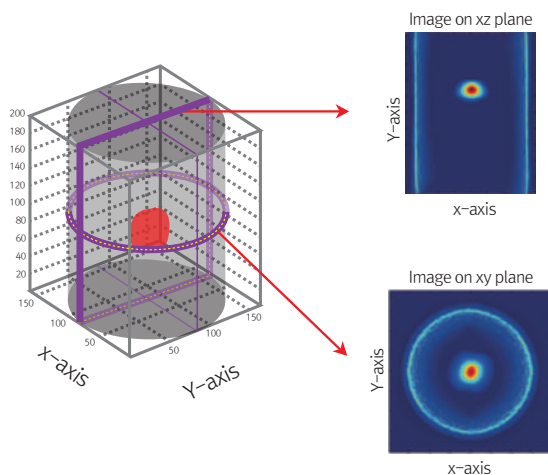
Waste Drum Emission CT

RAD IQ™ DI1000, a gamma emission computed tomography has been developed that can identify and quantify all detectable radionuclides in waste drums.

Unlike conventional technology, it uses a 2 dimensional imaging platform which is consist of a single plate of sodium iodine scintillator detector optically coupled to 2 dimensional array of photomultipliers. This assembly is located within a heavy lead shield housing. A pinhole collimator with exchangeable pinhole tungsten insert allows only incidences from acceptable angle for image reconstruction.

The whole detector assembly is mounted on 2 axis motion tracks which enable its up/down and in/out motions. And the waste drum can be rotated on a turn table conveyer. The detector field of view (FOV) is configurable by the 2 axis detector motion tracks and a drum up to size of 200 liter can be imaged in a single FOV.

RAD IQ™ DI1000 provides non-destructive assay (NDA) of radioactive waste drum like physical homogeneity, visualization of distribution of radiation, voids and cracks.



3D Reconstruction Example



RAD IQ™ DI1000 system

Key features

- High sensitive 2 dimensional NaI based imaging detector
- Exchangeable tungsten pinhole insert
- Large FOV (field of view) detector covers up to 200-liter drum in a single view

Applications

- Non-destructive assay of radioactive waste drum
- Visualization of distribution of radiation
- Quantify radiation detectable within a drum

Key Specifications

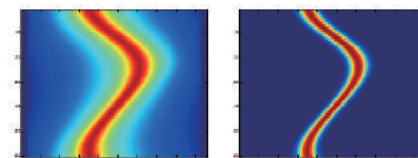
System	Dimension		2,180 x 2,200 x 2,100 mm
	Weight		~ 1,500kg
	Voltage		380V-3PH
Detector	NaI(Tl)		276.3 x 168.3 mm
	Thickness		8 mm
	PMT		32ea, 1.5 in.
	Lead shield		8 mm
Detector NEMA performance	FOV		230 x 150 mm
	Energy		20 – 2000 keV
	Resolution		Cs137 662keV @ $8 \pm 1\%$
	Intrinsic Uniformity		CFOV (2, 2.5%), UFOV (2, 2.5%)
	Intrinsic resolution		CFOV: 3.3mm, UFOV: 3.8 mm
	Intrinsic linearity		CFOV (0.2, 0.2 mm), UFOV (0.2, 0.7 mm)
Pinhole Collimator	Dimension		327 x 253 x 130 (mm)
	Thickness		30 mm
	Pinhole insert (tungsten)		5mm, 10mm (typical)
Detector & Drum Motion	Detector	Height range	0 – 1,000 mm
		in/out range	0 – 1,500 mm
	Drum	Rotation range	0° ~ 360°
		Rotation Speed	0~200 mm/m
		Max drum capacity	up to 200 l

Application SW

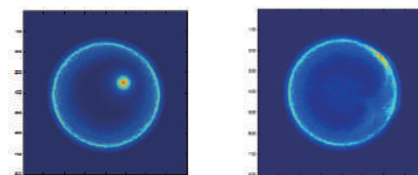
The application SW of RAD IQ™ DI1000 consists of two parts. One covers system operational functions including detector motion handling, drum load and rotation and detector FOV adjustment. The other part covers data acquisition, data storage, image reconstruction and analysis.



Application SW



Sinogram



Hot-spot imaging

Scatter image