

Far Field Gamma Monitor

G3620-340

Introduction

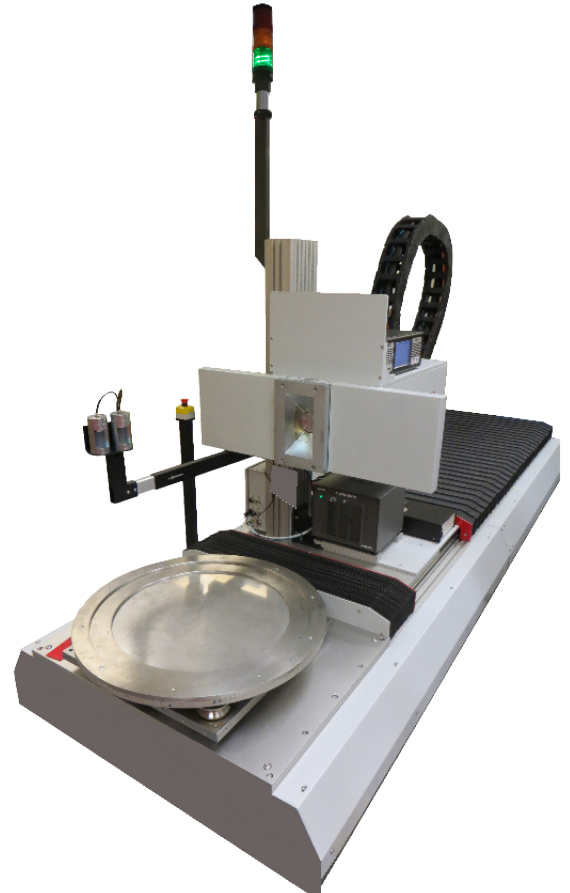
The ANTECH Model G3620-400 Far Field Gamma Monitor (FFGM) is a High Resolution Gamma Spectroscopy system used for the assay of standard 220L (55 US Gal) and overpack 340 and 400L (85 US Gal) drums employing the ISO 19017 Open Detector (or Far Field) geometry approach. The Open Detector (or Far Field) measurement method, where the entire measured object is in the field of view of the detector, is the most widely used method for measuring and assaying drums or objects of radioactive waste. It assumes:

- Homogenous distribution of activity in the drum
- Homogenous distribution of density in the drum

Based on these assumptions, the ANTECH FFGM provides a high throughput and accurate assay solution for drum where these assumptions are valid.

Features

- HPGe Detector with either liquid nitrogen or electro-mechanical cooling, positioned at the drum center height.
- Graded Lead detector shielding from background.
- Collimated detector field of view, localised to view to the entire waste drum .
- Automated surface dose measurement and Detector Filters to reduce the count rate (dose-rate) at the detector.
- Automated horizontal detector distance adjustment based of surface dose-rate.
- Measurement platform including Automated weigh-scale providing average density correction, and drum rotation.

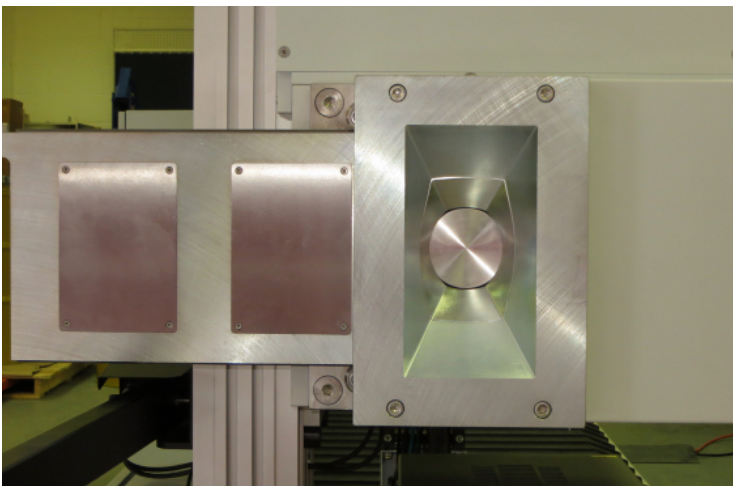


Detector Shield, Collimator & Filters

The detector is shielded with a stainless steel clad lead shield, with 2" (50mm) thick lead on all sides of the detector. This shield contains a graded internal liner of tin and copper to suppress lead x-rays generated in the lead shield. On the rear of the detector, split lead back shields provide further shielding from background contribution.

In front of the detector is an MCNP designed fixed steel collimator, providing a field of view localised to the drum. An automated filter axis installs two thicknesses of tungsten filter to reduce detector deadtime. As standard, the filters are 15mm and 30mm thick tungsten with the option of up to 4 filter thicknesses.

The filter is automatically selected based on the surface dose measurement carried out by the Dose Probe assembly as part of the pre-scan, and based on horizontal position of the detector column.

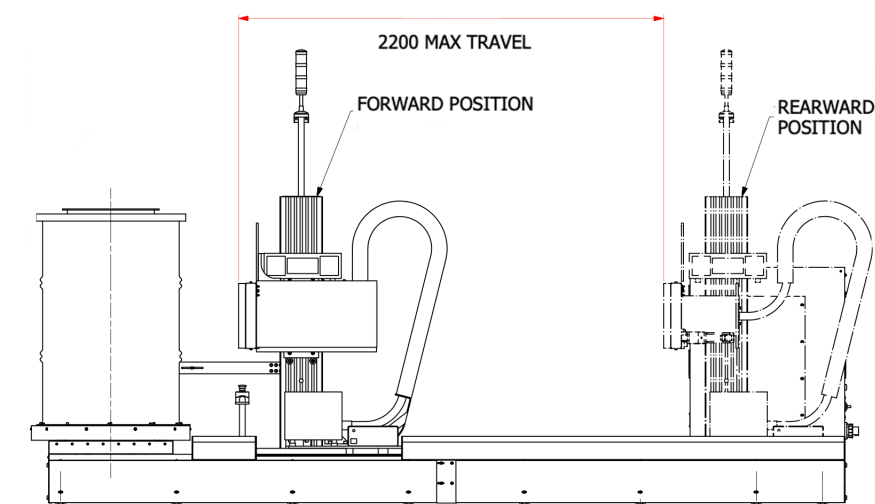


FFGM Field of View Collimator with two Filter options for reduced detector dead time

Automated Horizontal Axis

The FFGM features an automated horizontal axis, increasing or decreasing the distance between the detector and drum to reduce count rate and reduce detector dead time. The horizontal distance is set by the surface dose measurement carried out by the Dose Probe assembly as part of the pre-scan. Based on the activity, and the filters installed, the horizontal axis distance is automatically set to provide optimum assay setup, with acceptable detector dead time and assay duration.

This substantially increases the range of activity drums the FFGM can assay.



ANTECH G3620-400 FFGM Horizontal axis travel during assay

Benefits

- Measures wide range of sample activity from very low level waste (VLLW) where the density is uniform to high activity remote handled (RH) waste
- High Measurement throughput and reduced assay time compared to alternative techniques.
- Automatic dose measurement and detector filters to reduce detector dead time for measurement of drums and objects with a high surface dose rate
- Automatic horizontal axis distance adjustment (<2.2m) to reduce detector dead time using $1/r^2$ law.
- Reduced Counting time and increased efficiency as the entire drum or sample object is within the detector field of view
- Automated Background Subtraction

Specification

Detector	Ortec High Purity Germanium (HPGe) detector, 40% Standard, with LN2 or electro-mechanical cooling options
Drum Platform	Automated Weigh Scale (1.5t), automated rotational axis
Collimator & Filters	Field of View collimator and filter options of 15mm, 30mm as standard.
Spectrum	A single gamma ray energy spectrum is obtained during the measurement for each waste drum or object
Multi-channel analyser (MCA)	Ortec DSPEC 50
Software	ANTECH FarField Gamma Monitor, ANTECH IsoCorr, Ortec GammaVision, Windows Operating System
Power Requirements	240 VAC, 1500 VA
Options	Infeed & Outfeed Roller conveyor for drum (un)loading (<3m, <5m, <10m available) Different collimator options and additional gamma ray attenuating filters (up to 4 total). Increased Efficiency Detector Comprehensive factory calibration available for a wide range of drums and objects. Automated Barcode Reader for drum accountability Variable stroke length for horizontal axis - 2.2m standard. Options to increase or decrease