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# SGEAS

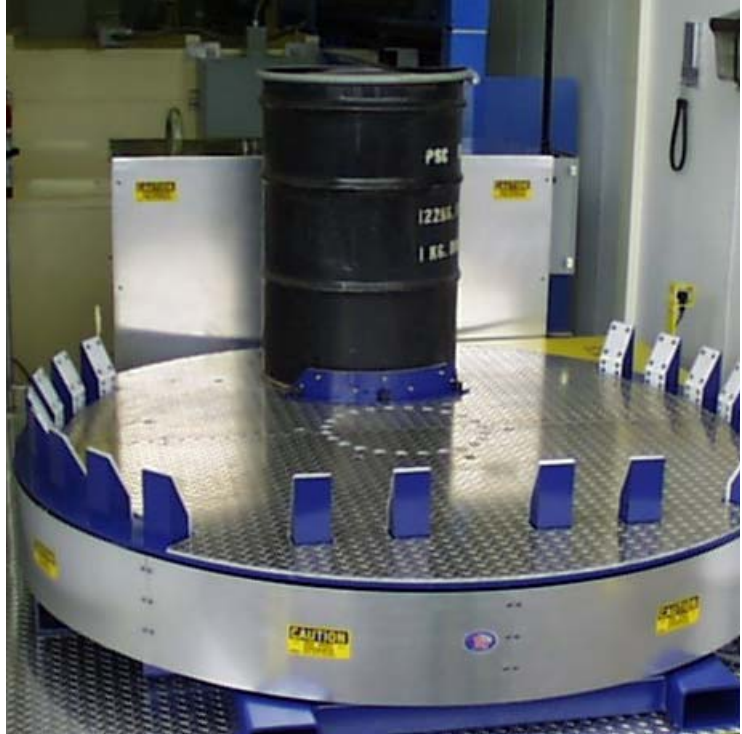
## Single-shot Gamma Energy Analysis System

The *SGEAS* non-destructive assay system employs the far field or “single-shot” High Resolution Gamma Spectroscopy (HRGS) technique for accurate characterization of waste drums and boxes.

A simple and robust weight based attenuation technique is used to correct for the effect of the waste matrix. This technology has become the standard method for rapid characterization of waste containers in many countries.

The output of the HRGS measurement may be either absolute nuclide activities or relative isotopics, e.g. using PC-FRAM, for input into a separate neutron assay system.

A complete inventory of nuclide activities may be determined from the measured gamma-ray emitting nuclides by applying pre-determined scaling factors.



### Features

- Uses HRGS far field method
- Integrated turntable & weigh-scale
- Suitable for assay of drums and boxes up to 2000 liters (500 US Gallons) in volume
- Uses ORTEC® Maestro® -32 gamma data acquisition software
- Various analytical software options with advanced peak fitting
- Bulk attenuation curves determined from matrix weight
- Isotopic output to neutron assay system
- Measurement control checks and internal data quality verification
- Customizable hard copy report
- Easy container loading / unloading
- Reliable high performance digital spectroscopy electronics
- Variable collimation

### Applications

- Waste management & disposal
- Decommissioning
- Criticality safety
- Safeguards & accountancy
- Nuclear Power Plants

### Benefits

- Rapid and accurate measurements
- Overcomes the “reject drum” problem often associated with segmented / tomographic scanners (SGS / TGS)
- Suitable for low, medium and high density waste streams including combustibles, metals & sludge
- Flexibility for different container sizes
- Assay of homogeneous & heterogeneous waste
- Minimal operator training required
- Meets waste acceptance criteria and regulatory requirements

## Specifications

Measurement Technique:	High Resolution Gamma Spectroscopy
Matrix Correction:	Bulk attenuation weight correction
Maximum Container Size:	2000 liter container (500 US Gallons)
Gamma Detector:	HPGe with energy range 50 keV to 2.5 MeV
Detector Efficiency:	20% standard (custom options available for tailoring to waste streams)
Cooling:	Liquid Nitrogen with 30 liter dewar. Optional mechanical cooling available.
Background Shielding:	Copper lined lead / steel shielding and collimation provided.
Attenuators / Filters:	Provided (for optimization to waste streams)
Turntable:	Provided
System Control:	Local Industrial Control Panel
Weigh Scale:	Provided
Electronics:	Digital Spectroscopy with integrated Multi-Channel Analyzer
Measurement Control:	<sup>152</sup> Eu source is used to verify system is within calibration on a routine basis
Max Package Surface Dose Rate:	200 mrem/hr (2 mSv/hr). Additional attenuators / filters available for high rad drums.
Max Package Weight:	2200 kg
Software:	ORTEC <sup>®</sup> Maestro <sup>®</sup> -32 used for data acquisition. PC-FRAM provided for isotopics. Analysis software provided for determination of nuclide activities and/or relative isotopic mass fractions. Output may be integrated with neutron assay data.
Controls:	Start / stop assay. Emergency stops. Optional integration with conveyor systems.
Data Inputs:	Container net weight
Data Outputs:	Printed reports. Electronic data. Optional integration with data management systems.

## Performance

Assay Time:	Typically 10-15 minutes. Configurable to waste stream.
Average Throughput:	>4.0 packages / hour
Measurement Uncertainty:	< +/- 40%
Max Input Count Rate:	100,000 cps. Optional Transistor Reset Preamplifier & High Count Rate Electronics may be supplied for extended dynamic range
Applicable Matrix Types:	Organic & inorganic waste (combustibles, glass, metals, filters, sludges)
Lower Limit of Detection:	<sup>60</sup> Co 8 kBq (220 nCi), <sup>137</sup> Cs 10 kBq (270 nCi), <sup>235</sup> U 0.2 g in 30 minute count

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