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SuperHENC

Super High-Efficiency Neutron Counter

The **SuperHENC** is a high-efficiency passive neutron coincidence counting system for the rapid assay of plutonium waste in large containers.

The system can be trailer-mounted and integrated with a Gamma Energy Analysis system for isotopic measurement.

The SuperHENC incorporates state-of-the-art hardware and software (developed at Los Alamos National Laboratory) designed to minimize cosmic ray interactions, resulting in a very low limit of detection. This enables the system to perform Low-Level Waste (LLW) / Transuranic (TRU) segregation.



Features

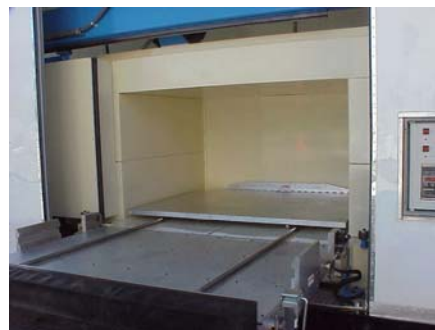
- Fast, accurate and precise results.
- Meets WIPP WAC certification requirements.
- Pre-calibrated to most matrix types.
- Quick on-site setup.
- Innovative matrix correction techniques.
- High sensitivity passive neutron coincidence counting with multiplicity analysis option.
- Integrated high resolution gamma-ray spectroscopy system identifies and quantifies gamma emitting nuclides.
- Determines Pu content, isotopic composition, total alpha activity & fissile gram equivalent.
- Protected against mechanical shock and electrical interferences.
- Assay time as low as 5 minutes.
- Large measurement dynamic range - fully dead-time corrected.

Applications

- ☑ Waste management & disposal
- ☑ Decommissioning
- ☑ Criticality safety
- ☑ TRU/LLW segregation
- ☑ Safeguards & accountancy
- ☑ Waste assay for transport and disposal

Benefits

- Transportable platform with rapid set up enables assay of waste at sites where purchase of measurement instrumentation is difficult to justify.
- Safeguards, criticality, transport & disposal criteria.
- Assays a wide range of different waste matrices and Pu or U isotopic compositions.
- Operationally proven – complies with applicable waste disposal regulations.



Specifications

Measurement Technique:	Passive neutron coincidence counting. Multiplicity analysis mode available
Matrix Correction:	Add-A-Source (AAS) using ^{252}Cf
Chamber Size:	Accommodates drums and standard waste boxes up to 1900 liters
Neutron Detectors:	260 ^3He detectors (10 atmospheres) in double row arrangement
Weigh Scale	Incorporated in gamma system turntable
Assay Chamber Efficiency:	40%
Software	INCC and Neutron Gamma Integration (NGI)
System Control:	Local Industrial Control Panel
Measurement Control Checks:	^{252}Cf AAS is used for daily normalization check
Max Package Surface Dose Rate:	200 mrem / hr (2 mSv/hr)
Max Package Weight:	2268 kg (5,000 lbs)
Package Rotation:	Gamma system includes turntable for crate rotation. Neutron assay does not require rotation.
Data Inputs:	Pu isotopics from process knowledge or isotopic gamma analysis
Data Outputs:	Printed reports and electronic data files. Optional integration with data management systems.
Gamma detector	Single high purity germanium (HPGe) detector

Performance

Assay Time:	Precision based count varies from 5 - 30 minutes based on container activity
Average Throughput:	3 packages / hour
Measurement Uncertainty:	< +/- 30%
Maximum Pu Range:	500 g Pu
Applicable Matrix Types:	Organic & inorganic waste (paper, plastics, metals, filters, sludges etc.)
Lower Limit of Detection:	100-200 mg WG Pu. Less than 100 nCi/g (3700 Bq/g) TRU alpha for standard waste boxes.

Contact

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