

Model 3200-320 - Segmented Gamma Scanner

Benefits



- 3200 System for Waste and Safeguards measurements
- Upgradeable to full TSGS 3800 specification
- Version available for cans and up to 400 Litre Drums
- Detectors and sources on the same level ensuring continuous alignment.
- Improved safety of transmission source holder design facilitates ease of source handling
- Both automatic and manual operation of the scanning system
- One pass or two pass mode operation, which is user selectable
- Windows based display screens for ease of use and 'user friendly' operation
- Direct communication of results data to a controlling data storage computer or other ANTECH assay instruments via Ethernet

Features

- Automatic gamma-ray energy calibration using a variety of transmission sources
- Measurement time of typically less than 15-30 minutes. Increased accuracy and precision can be achieved by extending the measurement time
- Mobile operator control console which can be local or remote from the instrument
- Model 3200-320 is designed for the non-destructive assay of up to 200 litre drums and 200 litre drums contained in a 320 litre (85 gal) overpack drum containing gamma-ray emitting nuclear waste.
- Employs gamma-ray spectroscopy to detect and measure nuclides of interest and to measure and correct for the average gamma-ray attenuation in segments of the drum.
- MasterScan SGS analysis software complies with Standard Test Method for Non-destructive Assay by Segmented Passive Gamma-ray Scanning, ASTM standard No. C1133.

Description

Segmented gamma-ray scanning (SGS) provides a non-destructive method for measuring the radionuclide content of waste. It is relevant to waste in a variety of matrices and chemical forms. The method involves rotating the drum or sample while scanning a vertical segment and it is applicable to waste where the chemical form and the relationship between the nuclide and matrix may be unknown. The method provides a vertical profile of gamma-ray transmission through the drum and nuclide concentration within the waste drum. The measurement procedure is highly automated and requires little operator interaction.

The ANTECH Series 3200 SGS is designed to measure low level radioactive waste arising from industrial, medical and nuclear power industries. The ANTECH implementation of the SGS technique complies with Standard Test Method for Non-destructive Assay by Segmented Passive Gamma-ray Scanning, ASTM standard number C1133.

The assay method for the nuclides of interest is accomplished by measuring the intensity of a characteristic gamma-ray from each nuclide. The intensity of the characteristic gamma-ray is corrected for count rate losses and attenuation in the sample. The relationship between the observed gamma-ray intensity and nuclide content is obtained by comparison to similarly corrected gamma-ray intensities observed during the gamma-ray measurement of known mass calibration standards.

The drum is rotated about its vertical axis and simultaneously scanned, segment by segment along the vertical axis. This method of scanning reduces the effects of non-uniformity in density and nuclide distribution. Corrections are made for count dependent losses from pulse pile-up and analyser dead time, as these are monitored during the measurement process. The system will operate in either one or two pass mode, as specified by the operator.

For each linear segment of the drum the average linear attenuation coefficient is calculated by measuring the transmitted intensity of an external gamma-ray transmission source. The source is mounted directly opposite the gamma-ray detector on the far side of the drum.

Specification

- Automation of 2 axes of motion.
- Germanium Coax detector efficiency 20%.
- Digital MCA based on the ORTEC DSPEC Junior.
- Overall instrument envelope: 1835mm long, 1512mm wide, 1785mm high.
- Variable sample drum and can size to a maximum of 320L.
- Ethernet communication from operator computer control console.
- Replaceable collimator (Cans or Drums).
- Adjustable detector position for optimum measurement of cans and small containers.
- User friendly software runs under Windows NT4 and uses Nuclear Software QA requirements of NQA-1 (required for WIPP certification).