

Drum Radiation Monitoring

Background

Identifying the content of waste packages is an essential part of waste management activities to document the waste package parameters necessary to meet the storage or disposal requirements. Westinghouse provides a customizable drum radiation monitoring system for the non-destructive analysis of waste drums. We can provide a smooth integration of this system into a larger processing system.

The drum radiation monitoring system offers fully automatic measuring of the required drum parameters and this data can be stored and transferred into a database. The drums (e.g., 200 liter (L) drums or 400 L drums) can be loaded via crane, roller conveyor, chain conveyor or other transport devices into the monitoring system.

Description

Once a drum is placed into the monitoring system, its weight is measured. During drum rotation, achieved by a turning device, a high-purity germanium (HPGe) detector measures the gamma spectrum at several heights of the drum. Thereby, a segmented nuclide inventory of the drum can be established.

A computer software package is provided to analyze and store the measured values. Further, dose rate sensors are positioned at the top, the bottom and at the drum side (three detectors) to measure the contact dose rate of the drum, as well as a detector located 1 m distance from the drum. The sensors are delivered in the necessary measuring range. Multiple sensors can be applied to cover a broad dose rate range. During the measurement and drum rotation, a smear test pad is applied to take a sample at the drum lid flange (the most likely place for contamination). Other positions to take the test can be specified. Shielding is usually provided by the building structure, but additional shielding walls can be added to achieve a suitable background radiation.

The measurement features can be integrated as modules into the system to obtain the combination required by the customer; e.g., dose rate measurement without gamma-scan.

The system is suited for single application, but also as an integrated part of a large waste treatment facility.



Drum radiation monitoring system

Benefits

A Westinghouse drum radiation monitoring system provides the following features:

- Segmented gamma scanning (HPGe detector)
- Dose rate measurement (contact and 1 m)
- Weight measurement
- Smear test at drum lid flange
- For 200 L or 400 L drums
- Scanner software and data storage
- Customized drum transport
- Modular combination of features
- Shielding by building or additional shielding
- Seamless implementation into larger waste treatment processes or as a stand-alone system
- Mobile shielding walls (optional) if the drum radiation monitoring system is built directly into the drum transport line
- Customizable number of detectors and package size

Experience

Westinghouse provided a dose rate measurement system to a nuclear power plant in Germany in 1992. Since that time, drum radiation monitoring components and systems have been provided to another German plant and to one in Taiwan as well as to 11 plant sites in China.