NUVIATECH INSTRUMENTS

GEM

GAMMA EXCAVATION MONITOR

GEM is a rapid bulk monitoring system for radiological characterisation of soil, concrete, bricks or other material. The system is capable of a real-time assay to determine the activity level within the excavator bucket. Each bucket typically requires just 10 seconds to complete a measurement depending on isotopes and required detection limits. Once completed, a light on the system automatically turns on to indicate the level of contamination and therefore its waste category.

BENEFITS

- Rapid assessment of contamination levels
- Spectral capability enabling reduced MDAs through ROI counting
- Robust design for site operations
- Low background and temperature stabilisation of the detector
- Wireless operator control allowing safe working environment
- Limited training for excavator driver due to clear light signals

KEY FIGURES

350 tonnes

Approximate quantity of material that can be segregated each day

0.02 – 70 Bq/g

Typical range for ^{137}Cs

700 kg *Weight*

Ref.GEM_NCZ117_12June2019_Rev03_EN

GEM

GAMMA EXCAVATION MONITOR

PRODUCT DESCRIPTION

- The system is battery operated and uses plastic or NaI(Tl) detectors (as well as a GM (Geiger-Müller) module to identify detector saturation). Detector is placed in a shielded housing inside a heavy-duty frame to minimise the background radiation contribution.
- Two banks of coloured lights (white, green, orange and red) are mounted on opposite sides of the frame, giving operators a clear indication of the operation and measurement result.
- An excavator bucket of material is positioned above the upper steel platform over the detector, triggering proximity switches that launch the counting process. Each bucket requires a few seconds to complete a measurement dependent on isotopes and required detection limits.
- Following completion of the count time (defined by isotopes and required limits of detection) the activity category is indicated by the lights.
- GEM is fitted with skids and lifting eyes to allow the unit to be easily redeployed around the site by a forklift, excavator or other means.
- Approximately 350 tonnes of material can be measured and segregated each day.
- Data for each bucket is uploaded from GEM to a tablet ensuring records are stored with the radioactive inventory and quantities of material analysed.
- Using ROI (region of interest) counting enabled by the use of the sodium iodide scintillation detector to look at the spectral characteristics, the MDAs (minimum detectable activities) of the system can be reduced.

PRODUCT APPLICATIONS

- Environmental measurement
- Material segregation
- Waste content declaration

Product Specifications	
Detectors	Interchangeable plastic (200 x 200 x 100 mm) or NaI(Tl) (4″ x 4″ x 8″) scintillation detectors
Heavy-duty frame	1.3 m^2 footprint, height 0.75 m
Weight	700 kg
Onboard control unit	Ruggedised tablet with Android* OS and control software application; embedded Windows* PC with a wi-fi module; inbuilt PLC with LED display and keyboard
Data download	To Android*-based tablet or laptop via wi-fi
Count time	Defined by isotope and detection limit requirements; typically around 10 seconds to achieve IAEA activity concentration limits
Lead shielding	Yes
Power supply	Battery operated, rechargeable batteries and charger
Other	Optical proximity sensors, 8 lights (2 sets, each with 4 colours)