

# Gamma Eye

## Contamination Monitors



Bretby Gammatech Ltd has over twenty five years' experience using natural gamma technology principally for detecting and quantifying the dirt or ash content of coal. The dirt associated with mined coal contains significantly higher concentrations of the naturally emitting radio-nuclides  $^{40}\text{K}$  and the Uranium & Thorium series than the coal itself. A sensitive gross gamma sensor can be calibrated to provide a measurement of the ash content based upon the concentration of these trace radioisotopes in the dirt. Well over one hundred Bretby Gammatech systems are in everyday operation in over twenty countries around the world. This technology has now been used in two new "Gamma Eye" instruments developed by Bretby Gammatech Ltd for measuring the much larger bulk gamma emissions from, for example, material contaminated with NORM (Naturally Occurring Radioactive Material) scales, soil contaminated with fission products – using  $^{137}\text{Cs}$  as a marker and redundant concrete shielding – using activation  $^{60}\text{Co}$  as a marker.

### *The Gamma Eye - Bucket Monitor*

The Bucket Monitor provides a quick assessment of the bulk gamma contamination of excavated material within the bucket of a mechanical digger. This instrument contains a large scintillation crystal which is mounted within a substantial frame. The sensor is pre-calibrated for the contamination isotope of interest and can be set to alarm for discrete activity bands. The driver of the mechanical digger rests the bucket containing the excavated material on the frame and after a few seconds it provides him with a visual indication of the level of gamma contamination in the bucket. This indication is provided by a traffic light system – red, amber and green denoting the band within which the gamma contamination occurs. On the basis of this information the driver deposits the load in the appropriate place for subsequent disposal or processing. During operation no personnel are required to take meter readings, which is a key safety feature. Once calibrated the "Bucket Monitor" is very simple and rapid to use. No specialist nucleonic knowledge is required by the operator. The driver simply observes and acts upon the traffic light indications. He does not even need to activate the counting process as the instrument automatically senses when the bucket is correctly positioned. This instrument has already found applications at five different sites.



#### *Features:*

- ◆ Easily calibrated for a range of gamma contaminants
- ◆ User selectable alarm levels
- ◆ Automated initiation of counting
- ◆ Simple traffic light system to indicate alarm level reached
- ◆ Safe operation as no personnel need to be close to take meter readings
- ◆ Log of measurements maintained which can be downloaded to a PC
- ◆ Easy to generate and update background
- ◆ No moving parts
- ◆ 24 hour battery operation, powered by rechargeable sealed lead acid battery units
- ◆ Easy to transport around site

#### *Benefits:*

- ◆ Quick & easy assessment of gamma contaminated material
- ◆ Fast throughput (one tonne per minute)
- ◆ Reduced measurement time leading to reduced time on site
- ◆ Reduced reclamation costs

## ***The Gamma Eye – On-Belt Monitor***

The Gamma Eye is a fully on-line system providing a continuous assessment of the gamma activity of a conveyed load. In this instrument a large scintillation crystal is mounted over the conveyor transporting material such as soil, rubble or other bulk debris, suspected of being gamma



contaminated. As with the Bucket Monitor it works on a gross gamma signal and can be pre-calibrated for the contamination isotopes of interest. It provides a visual and audible warning if a user-selectable predetermined gamma count level has been exceeded. The instrument can, for example, provide signals to activate a diverter to deflect material above a specified activity level off the conveyor. Alternatively, the Control Unit can provide a “lock out” signal to the conveyor. The conveyor can only be restarted when the offending material, such as a radium dial, has been removed and the gamma count level has reduced to below the set threshold. The throughput is only limited by the feed rate to and the capacity of the conveyor. As with the bucket monitor there are no moving parts and it is simple to set up and use. The Belt Monitor is powered by a standard 120-240VAC 50Hz supply.

### **Features:**

- ◆ Easily calibrated for a range of gamma contaminants
- ◆ User selectable alarm level
- ◆ Fully on-line automated measurement
- ◆ Simple visual and audible warning to indicate alarm level reached
- ◆ Log of measurements maintained
- ◆ Measurement log can be downloaded to a PC
- ◆ Easy to generate and update background
- ◆ No moving parts
- ◆ 24 hour mains operation
- ◆ Easy to set up on site

### **Benefits:**

- ◆ Quick & easy assessment of gamma contaminated material
- ◆ Fast throughput (only limited by the feed rate to and the capacity of the conveyor)
- ◆ Reduced measurement time leading to reduced time on site
- ◆ Reduced reclamation costs

**These instruments are ideal for sites where significant quantities of gamma contaminated material need to be assayed and segregated within a short time frame.**

Both these instruments have been developed by Bretby Gammatech Ltd. in close association with Nuvia Ltd.

Bretby Gammatech Ltd., has an extensive network of agents and distributors around the world. Full details appear on the Website.

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