



INVIVO COUNTING

2250

FASTSCAN™ High-Throughput Whole Body Counter



FEATURES

- Processes 30-50 people per hour
- One minute count time for typical operation
- Two very large 7.6 x 12.7 x 40.6 cm (3 x 5 x 16 in.) NaI(Tl) detectors
- Patented LED stabilized detectors ensure accurate results despite changes in room temperature
- 150 Bq (4 nCi) ⁶⁰Co LLD with person in shield
- Vertical linear geometry for accuracy
- Shielded in all straight-line directions by 10 cm (4 in.) of low background steel
- Modular shield construction for easy assembly
- Rapid on-site analysis and presentation of results
- Full spectroscopy; not just a screening counter
- Apex-InVivo family of software for flexibility and ease of operation
- Extensive QA data collection program

DESCRIPTION

The Mirion Fastscan whole body counter is designed to quickly and accurately monitor people for internal contamination of radionuclides with energies between 300 keV to 1.8 MeV. The FASTSCAN system uses large area sodium iodide detectors and the Mirion Apex-InVivo™ and Genie™ software to achieve low minimum detectable activities with count times as fast as one minute. It is intended for use in power plants and other facilities where the possible contamination spectra are well known and uncomplicated.

The system is as easy to use as today's digital cameras. The operator simply positions the person to be counted inside the shield and in front of the detectors, and then begins the count with the software. The software starts the count, completes the count, stores the data, displays the spectral data, performs the analysis and prints the report. The best part is that this system will be ready for operation as soon as the installation is completed.

The FASTSCAN system includes two large sodium iodide detectors (NaI(Tl)) 7.6 x 12.7 x 40.6 cm (3 x 5 x 16 in.) that typically provide a priori Lower Limit of Detection of approximately 150 Bq (4 nCi) for ⁶⁰Co with a count time of one minute for a normal person containing 40K. The FASTSCAN system's dual detector design provides uniform or flat (±15%) response along the longitudinal axis from the thyroid of the tallest 99th percentile male to the lower gastrointestinal tract of the shortest female.

The FASTSCAN unit uses a shadow shield to minimize spectral background interference. This type of shield provides an optimal trade-off between shield size, weight and cost with background reduction for environments with slightly elevated background. The shield is constructed of 10 cm (4 in.) thick low background steel (2 in. in a few less critical areas).

Steel was chosen over lead because of its structural properties and because it doesn't contain ^{226}Ra which is always present in lead. The low background steel is manufactured for Mirion using a special cobalt-free process. This special process guarantees that the steel will be free of the ^{60}Co contamination found in normal steel. The FASTSCAN system's steel shield is covered with painted sheet metal and lined with molded plastic for ease of decontamination.

The Fastscan counter is designed to save facilities money in operation. It has no moving parts to minimize maintenance costs. The stand-up design also saves floor space and allows personnel to enter and exit the counter quickly and easily. The stand-up design also allows the use of front and backside counts to test for external contamination when a count result shows contamination.

The Mirion FASTSCAN Whole Body Counter is a turnkey system that includes all of the hardware, software and services needed for immediate operation. The FASTSCAN counter is factory integrated and calibrated before shipment. Once the system arrives at the customer's site it is installed by Mirion personnel or representatives and on-site training is provided.

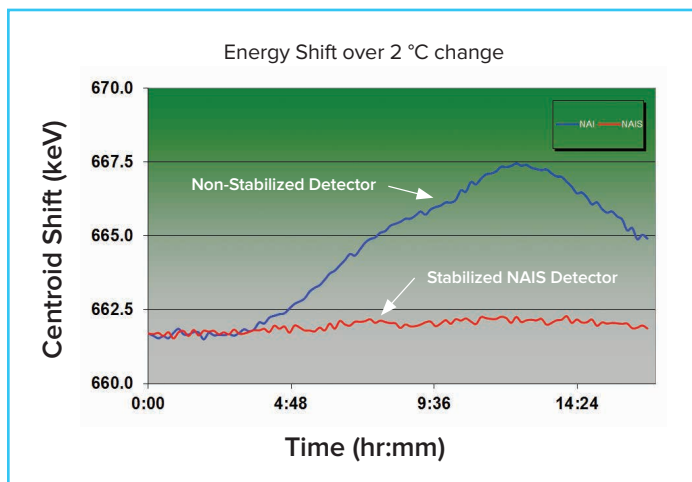


Figure 1 – Centroid variation for temperature range 20-22 °C

SYSTEM OPERATION

The subject enters the counting shield and leans against the back wall. There are molded positioning devices on the back wall that make it natural for the subject to stand in the correct location. The operator starts the count using the Apex-InVivo software included with the system. The software starts the data collection and brings up a subject demographics screen. The operator fills in a brief demographics screen about the count (subject name, ID number, reason for count, etc.). The rest is completely automatic. The Apex-InVivo software displays the spectral data during the acquisition.

It stops the count when the pre-programmed count time has elapsed, it stores the data, analyzes the spectral data and reports the results. Once the reporting phase of the count is completed the Apex-InVivo software automatically resets the system for the next count.

STABILIZED DETECTORS

The FASTSCAN counter can be built with stabilized NaI detectors. Stabilized detectors provide the additional benefit of keeping the energy response of the detector consistent despite changes in room temperature. Even slight variations of a few degrees can alter the response such that nuclide identification and quantification are adversely affected. Stabilized detectors eliminate this problem without requiring constant system validation and oversight by a technician. Stabilization helps ensure accurate results and increase throughput during busy times.

The patented LED stabilization has been used reliably for years in Mirion's stabilized NaI probes for handheld instruments such as the IPROL-1™ and IPROS-2™ devices. This same technology has been integrated into the FASTSCAN system. These detectors remain stable to within $\pm 2\%$ (typical) over the temperature range of -20 °C to 50 °C. No matter what the temperature range, your FASTSCAN counter will provide consistent and reliable results.

2250 | FASTSCAN HIGH-THROUGHPUT WHOLE BODY COUNTER

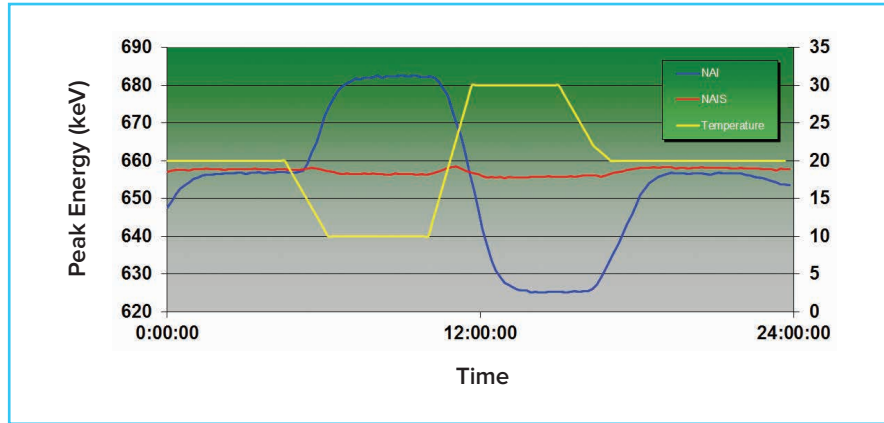


Figure 2 – Centroid variation for temperature range 10-30 °C

SPECIFICATIONS

Shield

- Total weight: 4800 kg (10 600 lb)
- Heaviest item weight: 385 kg (850 lb)
- Floor space required: 1.24 m x 0.9 m (49 in. x 35 in.)
- Height: 2.11 m (83 in.)
- Cable separation from shield: 9 m (30 ft)

Power

- Specify: 110/220 V ac, 50 or 60 Hz
- Requirements: Vary depending upon computer and electronics

Environment

- Operating temperature: Stable to within ± 1 °C
- Operating humidity: Non condensing
- Meets the environmental conditions specified by
- EN 61010, Installation Category I, Pollution Degree 2
- Background radiation: Normal background assumed
- General: Clean dust free area
- Detection limits: Actual system performance will vary with ambient environmental background

OPTIONS

- Model 2257 Transfer Phantom
- Single pedestal desk: 81 cm x 183 cm (32 in. x 72 in.)

ORDERING INFORMATION

Model	Description
2250-OS	FASTSCAN system with Osprey® unit, Stabilized Detectors, Apex-InVivo software
2250-OS-EX	FASTSCAN system with Osprey unit, Stabilized Detectors, Apex-InVivo, Extended Shield
2250-OS-EX2	FASTSCAN with Osprey, Stabilized Detectors, Apex-InVivo, Extended & Taller Shield
2250-L	FASTSCAN system with Lynx® DSA, Non-Stabilized Detectors, Apex-InVivo software
2250-L-EX	FASTSCAN system with Lynx, Non-Stabilized Detectors, Apex-InVivo, Extended Shield
2250-L-EX2	FASTSCAN system with Lynx DSA, Non-Stabilized Detectors, Apex-InVivo software, Extended & Taller Shield
2250-LS	FASTSCAN system with Lynx DSA, Stabilized Detectors, Apex-InVivo software
2250-LS-EX	FASTSCAN system with Lynx DSA, Stabilized Detectors, Apex-InVivo, Extended Shield
2250-LS-EX2	FASTSCAN with Lynx, Stabilized Detectors, Apex-InVivo, Extended & Taller Shield
2250-S-UPG	FASTSCAN upgrade kit to stabilized detectors (MCAs not included)
2250-OS-UPG	FASTSCAN upgrade kit to stabilized detectors and Osprey unit
2250-LS-UPG	FASTSCAN upgrade kit to stabilized detectors and Lynx DSA

