Licensable Technologies

Dynamic Radioactive Particle Source for CAMS

Applications:

- Development, testing, and calibration of CAM devices

Benefits:

- Allows a timed increase of a radioactive test signal into the CAM sensing volume
- Provides non-specialized, non-aerosol, in-house testing
- Low cost per unit
- Control of CAMs for multiple test scenarios
- Repeatability with electroplated source
- Simulation of realistic plutonium aerosol spectra
- Supports iterative development/evaluation of CAMs and software
- Adaptable for use in a number of different CAMs
- Does not contaminate tested CAM sampler
- Suitable for training purposes

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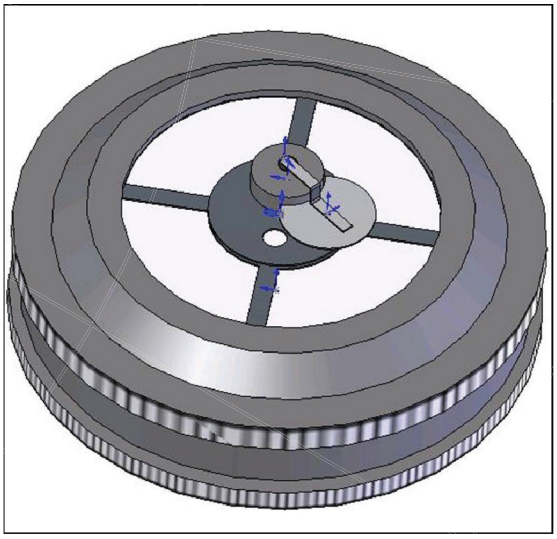
Summary:



For workers exposed to environments where airborne radioactive particles may be present, constant air monitoring is crucial to protect them from accidental inhalation of radioactive material. Continuous Air Monitors (CAMs) sample and measure the level of airborne radioactivity in a given area, however these devices require expensive calibration tests at facilities capable of generating diagnostic plutonium aerosols—a dynamic radioactive source. This can cost up to $10,000 per assessment and involves complex testing arrangements due to the dangers associated with airborne radioactive particles. Thus, industry demands an inexpensive means for calibration and testing of CAM devices.

Los Alamos National Laboratory scientists have developed an economical alternative to expensive plutonium aerosol tests. A moving mask over an electroplated source reveals time-increasing levels of radioactivity to a CAM detector. Built upon the mechanism of an analog wristwatch, the device fits into an operating CAM sampler, resting on top of the air filter. The spindle (hour, minute, or second) of the timepiece mechanism is fitted to a rotating mask that progressively uncovers an alpha- or beta-radiation emitting source. The watch crystal is replaced by a custom case where the source is mounted, and the watch spindle penetrates the top of the case. A particular aperture over the source can affect the rate at which the radiation is revealed to the CAM detector. Therefore, a user can realistically mimic the buildup of radioactive particulate material that collects on an air filter during operation in a sampling environment.

This small radioactive source allows one to perform benchtop testing for CAM design and evaluation without the use of expensive test facilities. The device is small enough to place inside of a typical CAM in order to simulate the presence of a plutonium aerosol cloud without contaminating the sampler itself. The device provides a low-cost alternative to expensive plutonium aerosol tests and facilitates the iterative development and evaluation of CAM samplers.

Development Stage: A prototype has been built.

Patent Status: Patent pending, US Patent Office Application #12433503

Licensing Status: Available for exclusive or non-exclusive licensing.

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