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Technology Transfer Office

Colorado State University

Rugged, Omnidirectional Dosimeter for Improved, Real-time Measurement of Human Exposure to Harmful Radiation

Tissue-equivalent proportional counters (TEPCs) measure and record the dose rate from complex mixtures of harmful, high-energy radiation. TEPCs offer the added advantage of simulating human tissue, which improves the estimate of the risk to humans compared to other types of dosimeters and thus increases personal safety. Unfortunately, the responses of most TEPCs are heavily dependent on the direction of the incident radiation and are accordingly unable to provide a realistic measurement of absorbed dose. Although a few TEPC designs offer some degree of direction-independent response, these devices are not sufficiently robust to withstand even modest amounts of vibrations and are particularly ill-suited as personal dosimeters that must survive sudden and often large accelerations..

Researchers at Colorado State University have designed a TEPC device that is both rugged and omnidirectional (provides a response independent of the angle of incoming radiation). Prototype devices are approximately thumb-sized and can be adapted as a personal dosimeter assigned to an individual or as an area monitor mounted in a workplace or vehicle Furthermore, these devices can be coupled to integrated electronics that both record the dose and quality of the radiation as well as provide real-time monitoring that generates instant alerts if the incident radiation begins to approach unsafe levels. This TEPC design can be scaled to larger dimensions for low dose rate applications or reduced in size for improved portability.

This device has multiple applications, including protection of first responders to nuclear accidents or terrorist events, monitoring of practitioners and patients during therapeutic radiation treatments (e.g. heavy ion cancer therapy), diagnostic medical examinations or surveillance activities associated with homeland security or nuclear non-proliferation as well as commercial high-altitude aviation and for astronauts inside space craft or outside during extra vehicular activities..

Please contact us for more information on commercial partnership and licensing opportunities.

ID: CSURF 10-072

Patent Information
Patent pending.

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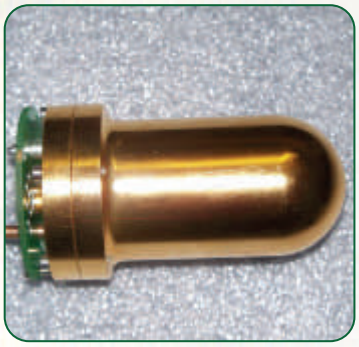

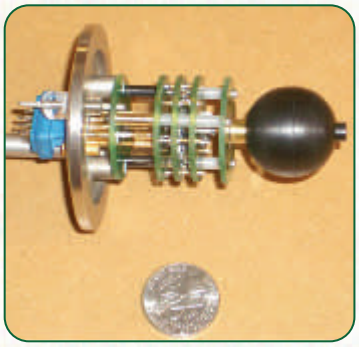

Features and Benefits

- Tissue-equivalent proportional counter provides industry-standard simulation of human tissue to radiation exposure.
- Omnidirectional response allows incoming radiation to be quantified from all directions with minimal bias.
- Small size and sturdy design withstands even the incredibly demanding conditions of space shuttle launch, making the device suitable for most imaginable working environments.
- Integrated electronics provide real-time monitoring of environment and allow warnings to be issued in the event that the incident radiation approaches unsafe levels.
- Multiple applications for civilian and military personnel, for example: first responders, medical practitioners and patients, surveillance (homeland security or nuclear non-proliferation), high-altitude aviation and manned space exploration.

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