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Review Article on:

NEW TREND IN RADIATION DOSIMETERS

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Thermo Scientific TM DXT-RAD Extremity Dosimeter



The Thermo Scientific DXT-RAD Extremity dosimeter is a disk dosimeter designed for nuclear power or nuclear medicine personnel that have a high risk of exposure to ionizing radiation, particularly on their hands, due to their work in close proximity to radiation materials and radiation producing equipment.

Gallery



Manufacturing processes that treat products with ionizing radiation

Process irradiation verification: Manufacturing processes that treat products with ionizing radiation, such as food irradiation, use dosimeters to calibrate doses deposited in the matter being irradiated. These usually must have a greater dose range than personal dosimeters, and doses are normally measured in the unit of absorbed dose: the gray (Gy). The dosimeter is located on or adjacent to the items being irradiated during the process as a validation of dose levels received



Pocket Dosimeter



•Instadose+ dosimeters allow for improved dosimetry compliance, while simplifying dose reads via iPhone, iPad, or PC at any time. With Instadose+, you can closely track exposure and pursue lower dose thresholds for high risk employees.

•The instadose+ dosimetry system revolutionizes the way RSOs manage their radiation monitoring programs. From automatic dose reads captured by iPhones, iPads, or PCs; to high dose notification alerts and online badge reassignments - this system simplifies the administration of any radiation monitoring program.

Product Description:

Immediate dose readings can be performed from any computer with internet access by connecting the instadose dosimeter (x-ray badge) to your USB port and logging into your secure online account. Based upon proprietary direct ion storage technology, the instadose device includes access to each user's historical and current exposure readings online. There is no need to send badges to a processing center, simplifying administration and reducing costs.

Benefits include:

- Unlimited real-time dose readings online
- Online badge reassignment
- Dose reports maintained online
- NO badge collection
- NO battery replacements or calibration

ABSTRACT

Background: A radiation dosimeter is a device that measures exposure to ionizing radiation. It has two main uses: for human radiation protection and for measurement of dose in both medical and industrial processes. The personal ionizing radiation dosimeter is of fundamental importance in the disciplines of radiation dosimetry and radiation health physics and is primarily used to estimate the radiation dose deposited in an individual wearing the device. Dosimeters can be worn to obtain a whole body dose and there are also specialist types that can be worn on the fingers or clipped to headgear, to measure the localized body irradiation for specific activities. **The aim of this study** is to identify and highlight the new technology in the types of radiation dosimeters. **Method:** The study comprises a personal selection of recent reports from radiology journals and the results of Medline searches which highlighted the new trend in radiation dosimeters. **Results and Conclusion:** Radiation dosimeters and dosimetry systems come in many shapes and forms, and they rely on numerous physical effects for storage and readout of the dosimetric signal. The four most commonly used radiation dosimeters are: Ionization chambers; Radiographic films; Thermoluminescent dosimeter systems (TLDs); Silicon diode dosimetry systems (Diodes). However, there are a variety of electronic personal dosimeters, extremity dosimeters, and comprehensive dosimetry management systems to monitor the exposure to ionizing radiation at any work environment. It can get an effective dose monitoring when and where we need it. Electronic dosimeters protect the wearer from the harmful effects of radiation by tracking changes in exposure and keeping an ongoing record of the user's dose over time. Combined with access control systems, it is possible to limit total exposure to radiation and control access to radiological areas. Dosimetry readers, Ensure accurate radiation exposure monitoring. Manual and automated systems for whole body, extremity, neutron, and environmental monitoring are easy to operate, service, and maintain. Extremity dosimeter is a disk dosimeter designed for nuclear power or nuclear medicine personnel that have a high risk of exposure to ionizing radiation, particularly on their hands, due to their work in close proximity to radiation materials and radiation producing equipment. **Keywords:** Radiation dosimeter, Electronic dosimeters, Extremity dosimeter.

Key words: New Trend, Radiation, Dosimeter.

MAIN ADVANTAGES AND DISADVANTAGES OF THE FOUR COMMONLY USED DOSIMETRIC SYSTEMS

	Advantage	Disadvantage
Ionization Chamber	-Accurate and precise -Recommended for beam calibration -Necessary corrections well understood -Instant readout	-Connecting cables required -High voltage supply required -Many corrections required for high energy beam dosimetry
Film	-2-D spatial resolution -Very thin: does not perturb the beam	-Darkroom and processing facilities required -Processing difficult to control -Variation between films and batches -Needs proper calibration against ionization chamber measurements -Energy dependence problems -Cannot be used for beam calibration
TLD	-Small in size: point dose measurements possible -Many TLDs can be exposed in a single exposure -Available in various forms -Some are reasonably tissue equivalent -Not expensive	-Signal erased during readout -Easy to lose reading -No instant readout -Accurate results require care -Readout and calibration time consuming -Not recommended for beam calibration
Diode	-Small size -High sensitivity -Instant readout -No external bias voltage -Simple instrumentation	-Requires connecting cables -Variability of calibration with temperature -Change in sensitivity with accumulated dose -Special care needed to ensure constancy of response -Cannot be used for beam calibration



instadose+



Area Monitoring Dosimeter RadEye Product Family



With the RadEye Product Family, Thermo Fisher Scientific offers a wide range of advanced handheld instruments for radiation detection, gamma dose rate measurements and area monitoring.

RadEye - The next generation of radiation meters Thermo Scientific offers a comprehensive range of advanced instruments for radiation detection, dose rate and contamination measurements. The characteristic features of this versatile pocket meter are the small size, the ease and flexibility of operation and its superior measurement performance, which is provided by the use of sophisticated low power technology. Fully automated self-diagnosis minimizes required maintenance. All essential functions are easily accessed, even while wearing protective gloves. The top-mounted alarm-LED can be seen while the instrument is worn in a belt-holster. A built-in vibrator and an earphone-output provide silent alarming for use in very noisy environments.

Features

- Rugged and reliable
- Large graphic display
- Lightweight instruments, starting from 160 g
- Simple and intuitive user interface
- Easily configured for specific tasks
- Durable and shock resist
- Accurate with excellent EMI immunity
- Low power technology
- Use of rechargeable standard-size batteries



DMC 3000 Electronic Radiation Dosimeter

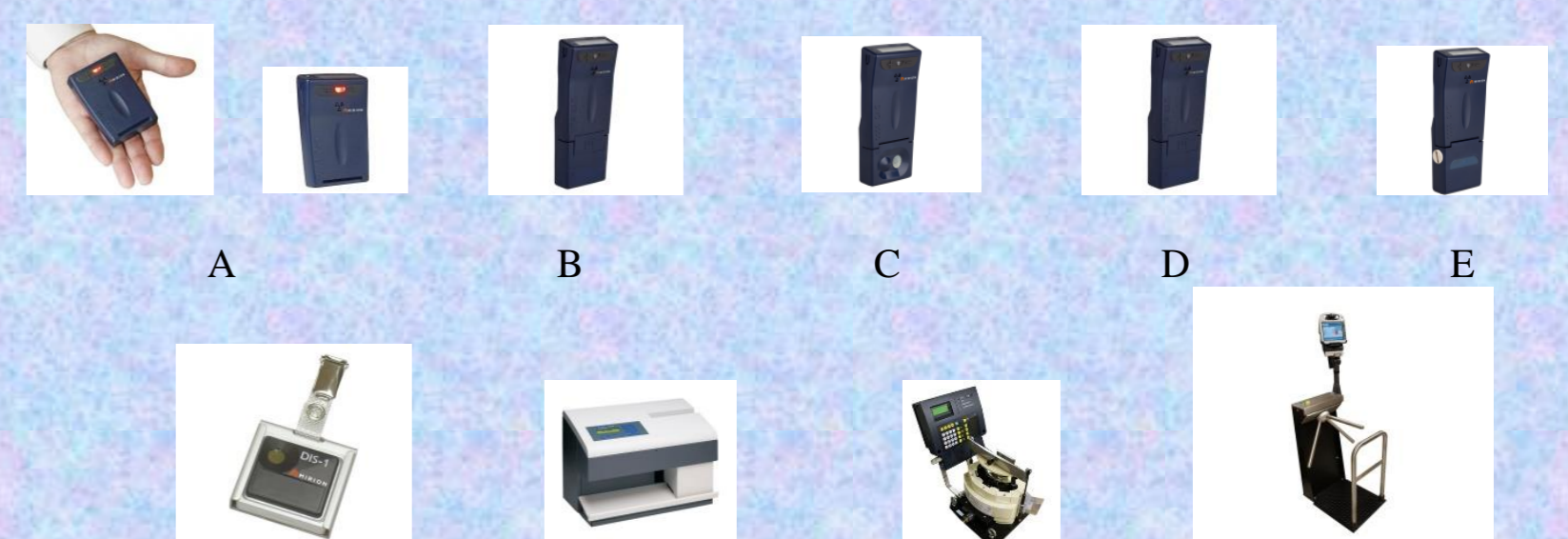
It features superior gamma and X-ray energy response, programmable alarms with visual LED, audible, and vibrating alarm indicators, simple 2-button navigation, and the ability to be fitted with external modules for expanded capabilities.

Product Features:

- Designed for ruggedness and durability.
- Loud audible alarms, coupled with ultra-bright LEDs and vibration capability.
- Simple 2-button operation and navigation of display options.
- Meets or exceeds applicable IEC and ANSI standards.
- Operates for up to 9 months on a single standard AAA battery.

Appropriate For:

- Nuclear Power
- Industry and Manufacturing
- Laboratories and Education
- Military & Homeland Security
- Healthcare



A: DMC 3000 Electronic Radiation Dosimeter, B: DMC 3000 PRD Module, C: DMC 3000 Beta Module, D: DMC 3000 Neutron Module, E: DMC 3000 Telemetry Module, F: DIS Dosimetry System, G: TLD Dosimetry System, H: Dosimeter Calibrators, I: Access Control Hardware