LANDAUER®

nanoDot™ Dosimeter

Patient Monitoring Solutions

nanoDots slide in and out of the adapter (2D bar code facing front) for readout in an original microStar reader

This is a nanoDot with alphanumeric sensitivity code and serial number (DN091=0.91 sensitivity). Either the front or back of the carrier can face toward the radiation source during exposure

nanoDots are read directly in the microSTARii reader

InLight® nanoDot dosimeters are designed for use in single point radiation assessment applications and are engineered to be read out by two available InLight readers - the original microStar® and the newer and smaller microSTAR®ii. The nanoDot offers complete reanalysis, requires no dosimeter preparation in the clinic and has a labeled sensitivity that is built into the dosimeter 2D bar code for rapid, accurate reading.

Overview

Regulatory authorities and experts agree that reducing radiation errors in medical imaging and radiation oncology is a priority, but there is little guidance on practical strategies. LANDAUER's optically stimulated luminesence (OSL) technology, featuring nanoDot dosimeters and microStar and microSTARii readers, provides one universal, simple and flexible solution to this complex problem.

Since 1998, OSL technology has been trusted to measure occupational radiation dose for millions of health care professionals across the globe. OSL dosimeters are used for occupational dose monitoring in more than 80% of hospitals in the United States and are the subject of more than 30 published, peer-reviewed scientific publications.

LANDAUER's nanoDot OSL-based medical dosimeter is the most effective tool to independently verify the quantity of dose delivered from radiation producing devices in medical imaging and radiation oncology. It provides an inexpensive insurance policy to mitigate litigation risk for your facility.

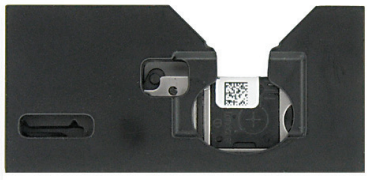
Technical Specifications	
Dose operating range	For general applications, useful dose range 5 mRad to 1500 rad (50 µGY to 1500 cGy); for medical dosimetry applications, linear response with dose up to 300 rad (cGy), software-supported non-linear calibration up to 1500 rad (cGy)
Lower Limit of Detection (LLD)	5 mrad (50µGy)
Useful Energy Range	From 5 keV to 20 MeV
Energy Dependence	Accurate within ±10% over diagnostic energy range 70-140 kvP; within ±5% for photons and electrons from 5 MeV-20MeV
Accuracy (total uncertainty - single measurement)	±10% with standard nanoDot; ±5.5% with screened nanoDot
Precision	Fully selectable, from 1–9,999 seconds per dosimeter

Technical specifications above reflect minimum expected performance when the microStar reader is operated in compliance with all LANDAUER recommended reader performance quality assurance protocols

*The nanoDot Dosimeter is registered with FDA as a class I, 510(k) exempt (registration number 3008426232) Radiologic Quality Assurance Device and should not be used to adjust the radiation dose delivered to a patient

(over)

Figure 1



The nanoDot can be read in the original microStar with an adapter. nanoDots slide in and out of the adapter with the 2D barcode facing front

The back of an open nanoDot carrier with 2D bar code that includes sensitivity code and serial number information

Each nanoDot is shipped enclosed in a plastic packet ready for clinical use

The nanoDot is a useful patient dosimetry verification tool

Features and Benefits

- Wide operating energy range (5 keV-20 MeV) makes nanoDots an ideal solution in multiple settings, including diagnostic radiology, nuclear medicine, interventional procedures, radiation oncology or any single point radiation measurement requirement[1]
- Complete reanalysis capabilities
  - Non-destructive readout allows for reanalysis and electronic data archiving, dose verification and intermittent analysis for total dose accumulation
  - No post-measurement correction factors required
  - 2D bar code contains dosimeter sensitivity and serial number for chain of custody
- Dosimeter preparation eliminated with single-use dosimeters
  - No heating parameters to maintain
  - No nitrogen gas required
  - No wire to be connected to the monitor or reader
- Minimal angular or energy dependence
  - Ideal for measuring skin dose at a point of interest, even in challenging clinical conditions
  - Curved surface dose (eye, breast) *see Figure 1*
  - Can be used for in- and out-of-field measurements, including pacemaker and eye dose
  - Ideal for surface dose and electron measurements
  - Ideal for use in RapidArc® or TomoTherapy®, total electron skin treatments, HDR, Brachytherapy or other complex applications
- Dosimeters can be placed anywhere on the body, are wireless and radiolucent
- Dosimeters can be used without buildup to make surface dose measurements or in radiation oncology with buildup to make measurements at various depths[2]

Note: LANDAUER provides a set of calibration dosimeters exposed at a beam quality of 80 kVp on a PMMA phantom at normal incidence for conventional (non-mammography) diagnostic radiology applications. For radiation oncology applications, LANDAUER provides a set of screened, unexposed calibration dosimeters that can be irradiated using a radiation therapy beam quality of your choosing, or you may alternatively request a calibration dosimeter set exposed to a 662 keV beam quality (Cs-137).

[1]For calibrating microStar readers appropriately, separate calibrations should be performed for diagnostic and therapeutic energies

[2]CIRS Plastic Water nanoDots buildup available in three sizes - 1.5cm, 1.0cm, or 0.5cm.

Contact CIRS 800-617-1177 or cirsinc.com to order

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