

InLight® Complete Dosimetry System Solution

nanoDot™ Dosimeter

InLight® nanoDot™ dosimeters are designed for use in single point radiation assessment applications, and are engineered to be read out by the smallest InLight® reader available—the microStar®. 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® OSL technology, featuring nanoDot™ dosimeters and microStar® readers, provides one universal, simple and flexible solution to this complex problem.

For 13 years, OSL technology has been trusted to measure occupational radiation dose for millions of healthcare professionals across the globe. OSL dosimeters are used for occupational dose monitoring in over 80% of hospitals in the United States, is the focus 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, and provides an inexpensive insurance policy to mitigate litigation risk for your facility.

*The nanoDot™ Dosimeter is classified as a Radiologic Quality Assurance Instrument, and should not be used to adjust the radiation dose delivered to a patient.



nanoDot™ carriers slide in and out of the adapter (2D bar code facing front) for read-out in a microStar® reader.



Front of nanoDot™ carrier with alphanumeric sensitivity code and serial number (DN093=0.93 sensitivity). Either the front or back of the carrier can face toward the radiation source during exposure.



Back of open nanoDot™ carrier with 2D bar code that includes sensitivity code and serial number.

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



The InLight® Dosimetry System is an example of LANDAUER® Fleximetry, the industry's most flexible dosimetry program. This flexibility allows you to manage your dosimetry program in the way that best suits your unique needs.





InLight® nanoDot™

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 requirement¹
- 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
- 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)
 - 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
- Dosimeter can be placed anywhere on the body, is wireless, and radiolucent
- Dosimeter can be used without buildup to make surface dose measurements or, in radiation oncology, with buildup to make measurements at various depths²

¹When microStar® reader is calibrated appropriately – separate calibrations are required for diagnostic and therapeutic energies

²CIRS Plastic Water® buildup available in three sizes – 1.5cm, 1.0cm, or 0.5cm

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).

Technical Specifications

Dose operating range:	For general applications, useful dose range 10 µGy to >100 Gy; 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):	0.1 mGy
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–20 MeV
Accuracy (total uncertainty - single measurement):	+/- 10% with standard nanoDot™; +/- 5% with screened nanoDot™
Precision:	+/- 5%, k=2 for both standard and screened nanoDot™

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To minimize our environmental impact, this brochure was printed using renewable energy on papers containing fibers from environmentally appropriate, socially beneficial and economically viable forest resources.

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