

LANDAUER®

Get the Reassurance of a Second Opinion with
microSTAR®ii and nanoDots™



Use a simple, flexible medical dosimetry system
to improve patient safety and quality

Why Measure Patient Dose?

Patient safety in radiation oncology is the focus of public attention and regulatory scrutiny. Greater complexity of treatments and evolving standards are further raising the bar for radiation safety and increasing risk to health care organizations.



There are many reasons to independently verify planned dose during or prior to the first fraction of radiation treatment as part of a patient quality assurance program, including compliance with professional practice guidelines, risk reduction, and improved safety and quality of care.

Patient-specific dose measurements offer you important information for early identification and correction of potential errors or deficiencies in the delivery of prescribed dose. LANDAUER's Optically Stimulated Luminescence (OSL) technology, featuring nanoDot medical dosimeters and the microSTARii medical dosimetry system offer a simple, flexible, wireless alternative to diodes or mosfets for in vivo¹ dosimetry and can also be used with a QA phantom to verify machine output.

The LANDAUER OSL-Based Dosimeter is the most trusted technology for measuring occupational radiation dose, and has been customized for medical dosimetry applications

microSTARii Medical Dosimetry System

The microSTARii Medical Dosimetry reader using nanoDots is simple and efficient

- Immediate, independent verification of planned dose using nanoDot dosimeters
- Improved readout precision and durability with state-of-the-art pulsed OSL technology
- Fast, efficient single dosimeter readout near point of use
- Compact, lightweight and portable

The microSTARii Medical Dosimetry System includes the following key components:

- The microSTARii reader
- The microSTARii graphical user interface software on an included PC running Microsoft Windows
- A 2D barcode scanner
- NanoDot Calibration and QC dosimeters

Software customized to medical dosimetry applications for streamlined analysis, reporting and reimbursement

- Automated QC functionality for efficient implementation of the LANDAUER microSTARii reader Quality Assurance Program
- Patient-centric workflow, with additional fields for patient and exposure information, automated re-reading capability for improved accuracy and efficiency

The screenshot shows the microSTARii medical dosimetry system interface. It includes sections for Operational Data, Patient Info, Exposure Info, and Results. The Results section contains a table with columns for Read ID, Beam Used, Test Counts, Raw Counts, and Dose (cGy). Summary statistics at the bottom show Avg. Element Counts (107151.8), Control Dose (cGy) (0.02), and Avg. Dose (cGy) (209.22).

Read ID	Beam Used	Test Counts	Raw Counts	Dose (cGy)
920	Weak	0	107308	209.93
921	Weak	0	107313	209.55
922	Weak	0	107244	209.42
923	Weak	0	106911	209.93
924	Weak	0	106782	208.52

Built-in dose reports to streamline reimbursement

¹ In vivo refers to superficial dose. Note: The data provided by this product is informational and for quality assurance control purposes. The output of the microSTARii is not to be used to adjust the dose to the patient.

nanoDot Dosimeters

A simple, flexible solution for measuring patient radiation dose

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 U.S. hospitals and are the focus of more than 30 published peer-reviewed scientific publications.

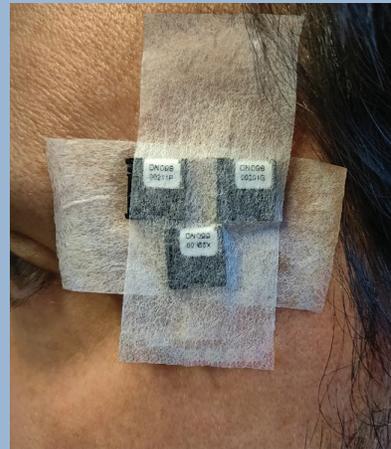
LANDAUER's nanoDot dosimeters, developed using proven OSL technology and the microSTARii medical dosimetry system is an effective tool for independent secondary verification of the quantity of dose delivered during radiation treatments. It allows you to mitigate risk for your facility.

Features and benefits of nanoDOT Dosimeters

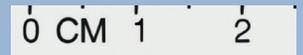
- Wide operating energy range (5 keV to 20 MeV) makes nanoDot medical dosimeters an ideal solution for dose verification in radiation oncology and other point dose measurement applications
 - Linear dose response with dose up to 3 Gy, software-supported non-linear calibration up to 15 Gy
- Reanalysis capabilities (non-destructive readout)
- Dosimeter preparation eliminated with single-use dosimeters
- Dosimeters are bar-coded for complete chain of custody
- Minimal angular or energy dependence in Megavoltage energy range
- Accurate within $\pm 5.5\%$ for photons and electrons from 5 MeV - 20 MeV*
- Dosimeter can be placed anywhere on the body, is wireless, and radiolucent
- For measuring dose at a point of interest
- Can be used for in- and out-of-field measurements
- Can be used without buildup to make surface dose measurements or with buildup to make measurement at depth**

* When reader is calibrated per recommended protocols and microSTARii QA program is implemented

** The reader calibration must be consistent with the clinical use mode in terms of build-up characteristics



nanoDot Dosimeter



The nanoDot Medical Dosimeter is compact and robust – ideal for a variety of dosimetry applications, such as secondary dose verification in radiation oncology and other point dose measurements

Radiation Safety is a Team Effort

Your Clinical Team

- Provide quality patient care and outcomes
- Execute Quality Assurance programs that reinforce patient safety initiatives
- Build trust in your community

microSTARii Medical Dosimetry System

- Establish a continuous patient and instrumentation quality assurance program for radiological procedures
- Independently verify planned dose
- Simple, flexible, wireless solution for patient-specific dose measurements
- Tested and adopted by leading credentialing authorities for radiation dose measurement

LANDAUER Implementation and QA Program Support

- In-house experts available for consultation to assist medical physicists implementing a new OSL-based medical dosimetry system
- For facilities without in-house medical physics expertise, LANDAUER's team of Qualified Medical Physicists can provide guidance on implementation of a medical dosimetry QA program that fits the unique requirements of your facility

Radiation Oncology

Join leading radiation oncology authorities by choosing LANDAUER's state-of-the-art OSL technology for dose verification

Radiological Physics Center

For more than 30 years, the Radiological Physics Center in partnership with the National Cancer Institute has used a thermoluminescent dosimeter (TLD) for remote audits of photon and electron beam output, and energy verifications for electron beams, monitoring more than 1,700 radiation therapy facilities worldwide and measuring more than 13,000 beams annually. In 2010, after conducting a multi-year clinical evaluation of the technology, the RPC converted to use of OSL dosimeters in more than 90% of its remote audit program.

“If I could only buy one dose verification system, I would buy OSLD, because OSLD can do every measurement that TLD and diodes can do, plus measurements they cannot accurately capture.”

— Paul A. Jursinic



Paul A. Jursinic, Ph.D., noted physicist in quality assurance work, investigated a wide range of technologies. He compared measured dose with calculated dose output and concluded that OSLDs are a good substitute for TLDs and diodes for in vivo dosimetric measurements, particularly for surface dose measurements.^{3,4}

Dose Verification System Compared

TLD	Diodes & Mosfets	OSLD	nanoDot OSLD
<ul style="list-style-type: none">• Labor Intensive• Time Consuming	<ul style="list-style-type: none">• Procedure-specific (multiple diodes needed for multiple energies)• Wires may be obtrusive during use• Not durable	<ul style="list-style-type: none">• Energy independent in therapy range• Ideal for point dose measurements• Proven superior accuracy and precision• Simple, flexible and wirefree	<ul style="list-style-type: none">• Individually bar-coded nanoDot dosimeters enable complete chain of custody

³ Jursinic, P.A., (2007) Characterization of optically stimulated luminescent dosimeters, OSLDs, for clinical dosimetric measurements. Medical Physics, 34(12):4594-604

⁴ Jursinic, P.A., (2015) Angular dependence of dose sensitivity of nanoDot optically stimulated luminescent dosimeters in different radiation geometries. Medical Physics, 42(10):5633-41