

SATURN™ TLD RING

An innovative extremity dosimeter designed to maximise hygiene and comfort

LANDAUER's ring dosimetry service provides comprehensive extremity radiation monitoring for workers required to manipulate or work in close proximity to radioactive materials and radiation producing equipment. It is approved by the HSE under Ionising Radiations Regulations 2017 and Ireland's EPA. The Saturn Thermoluminescent Dosimetry (TLD) ring is an extremity dosimeter recently introduced as an improved alternative to the original LANDAUER TLD ring dosimeter.

The Saturn ring measures exposure due to X, gamma and beta radiation with thermoluminescent technology. The TLD material is based on natural lithium fluoride providing the highest sensitivity.



- Flexible fit for unequalled comfort
- Precise reading - minimum reportable dose of 0.1 mSv
- A ring designed to maximise hygiene
- 2D barcode for easy scanning into myLDR.com

CONFIGURATION OPTIONS

Rings are available in three adjustable sizes: small, medium/large, and extra large to comfortably fit any user. The ring base colors are completely configurable down to the individual level and available colors are blue, green, and orange.



DISPLAY INFORMATION ON THE COVER INCLUDES

- Wearer's name
- Ring serial number
- Begin wear date
- Left or right hand indicator
- Exchange frequency
- 2D barcode for scanning



> ADVANCED DESIGN

With this design, the TLD is safely encapsulated underneath the ring cap which is ultrasonically welded to the polyethylene ring base. Under even the harshest working conditions, it's difficult to remove the ring cap from the ring base, so the chain of custody between the chip and the wearer is always maintained.

The identification on the cap is laser engraved, preventing the print from smearing, peeling, or washing off. Rings can be worn in dry or wet working conditions. Smooth edges allow rings to slide and fit inside surgical gloves without risk of tearing. The dosimeter is to be worn with the sensor towards the irradiation source.

> TLD TECHNOLOGY

During analysis in our laboratory, the TLD chip is heated causing it to emit light in proportion to the amount of radiation exposure. The luminescence is measured and a report of exposure results is generated. The glow curve of the readout permits a more conclusive evaluation of radiation exposure and can be retrieved and analyzed before the exposure report is generated if any anomaly appears.

The sum of the high energy beta, gamma and X radiation is reported as a shallow dose - $H_p(0.07)$.

> GENERAL CHARACTERISTICS

Radiation measured – Photons (X and Gamma) and Beta radiation
Detector – Single element, one TLD

The SATURN dosimeter is recommended to be sterilized by cold wiping with one of the following disinfectants:

1) Cidex® 2) Betadine®

We do not recommend heat sterilization with temperatures that exceed 40°C.

> ANALYSIS ASSURANCE

Rings are scanned before processing using optical character recognition to accurately identify and track each dosimeter from receipt to report. The TLD is read by stimulation laser and the light emitted is measured with a photomultiplier tube (PMT). The process is overseen by skilled technicians.

> TECHNICAL SPECIFICATIONS

Energy range	Photon (X or gamma) - from 20 keV to 1.2 MeV Beta (mean energy) - from 200 keV to 800 keV
Dose measurement Range $H_p(0.07)$	Photon (X or gamma) - 0.1 mSv to 10 Sv Beta - 0.1 mSv to 10 Sv
Accreditation	NVLAP (LAB CODE 100518-0) accredited in dosimetry categories IB, IC, IIC, IID, IIIB, IIIC, IIID, and IVBB. Tested per standard ANSI N13.32 and IEC 62387-1 : 2012. HSE and Ireland's EPA approved dosimetry services.

> ENVIRONMENTAL RESISTANCE CHARACTERISTICS

Operating and storage temperature	No effect on detector sensitivity up to 40°C
Humidity	No effect on detector up to 90% humidity
Exposure to light	No effect on detector

> CONTROL DOSEMETERS

Control ring dosimeters can be distinguished by the yellow cover and red base.

Control ring dosimeters should not be worn. They should be stored away from radiation sources together with the dosimeters of the same wearing period when not in use.

