

# DOSIMETRY EQUIPMENT

All-inclusive dosimetry lab solution

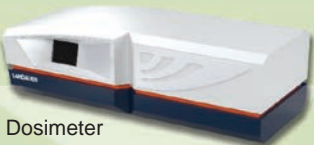
LANDAUER® offers you a complete dosimetry system. It covers all manufacturing and processing for dosimeters with a wide range of equipment such as: badges, readers, annealers, software...

## Laboratory equipment

InLight dosimeter



Dosimeter readers



IRAS software



IMLS software



## Equipment adapted to your environment and your needs

LANDAUER equipment is used for a large number of applications:

- Occupational dosimetry
- Area monitoring
- Environmental monitoring
- On-site analysis
- Emergency response monitoring.

InLight dosimeters monitor X, gamma, beta and neutron radiations and together with OSLR reader reports  $H_p(10)$ ,  $H_p(0,07)$  and  $H^*(10)$  dose.

Our equipment can be adapted for any size organisation, be in a nuclear power station, a laboratory or a hospital.

**Our aim – Our equipment can be adapted for any organisation size, being a nuclear power station, a laboratory or a hospital.**

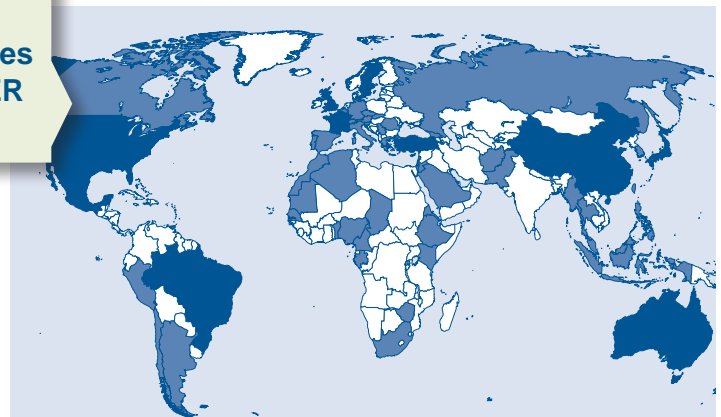
## No one knows more about dosimetry equipment than LANDAUER

Because we use it for our own dosimetry program and provide dosimetry services to about 2 million individuals globally, we understand your need better than any other manufacturer.

**More than 200 dosimetry laboratories in 60 countries operating with LANDAUER technology**

Establishment of LANDAUER laboratories in the world

- Countries with LANDAUER offices
- Countries with laboratories equipped with LANDAUER OSL technology



## OSL TECHNOLOGY

Based on  $Al_2O_3:C$ , Optically Stimulated Luminescence (OSL), our technology is used exclusively worldwide for radiation monitoring. The detectors material is manufactured by LANDAUER according to the highest standard specifications. The technology benefits 30 years of regular improvement. OSL features and benefits are:

- **Fully optical, no heating:** the readout process uses a light-emitting diode (LED) to stimulate the detectors and the light emitted by the OSL material is detected and measured by a photomultiplier tube using a high-sensitivity photon counting system. The amount of light released during optical stimulation is directly proportional to the radiation dose and the intensity of stimulation light.
- **Dose algorithms meet several accreditation bodies requirement:** US National Voluntary Laboratory Accreditation Program, and Department of Energy Laboratory accreditation Program accreditation requirements...
- **High sensitivity minimizing the stimulation:** the optical stimulation keeps more than 99 % of the information. The non destructive readout process of OSL  $Al_2O_3:C$  detector enables dosimeters to be archived and allows multiple reading in case of dose investigation. The detectors can be reused for several years.
- **Stable sensitivity over time:** OSL dosimeters sensitivity is defined forever. The stability of the material under any environment condition makes this sensitivity unchanged during all dosimeter's life.
- **No calibration is required:** the sensitivity of InLight is determined during the manufacturing process by an ISO/IEC 17025 accredited laboratory. The sensitivity value engraved on the detector is automatically considered during the reading process.
- **No fading:** InLight dosimeters make extended wear period possible as well as dosimeters archived reread without corrections for fade.

## COMPLIANCE WITH STANDARDS

EN 62387:2016 - Passive integrating dosimetry systems for personal and environmental monitoring of photons and beta radiation - Radiation protection instrumentation.

Characterisation of dosimeters carried out by an independent referenced laboratory : The French National Laboratory Henri Becquerel (LNHB) - CEA.

A large amount of laboratories worldwide using Landauer dosimetry equipment are approved according to ISO/IEC 17025.

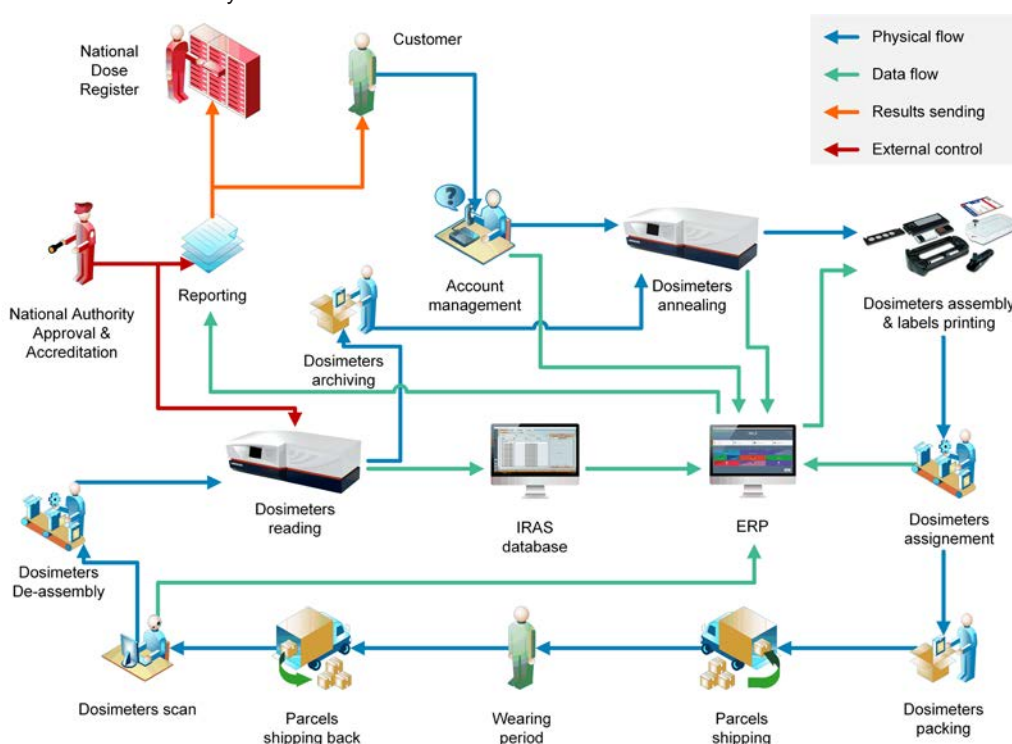
### SIMPLIFIED ACCREDITATION PROCESS

The system is scalable, and can be configured to complement your current dosimetry program, or can enable you to maintain your own in-house accredited dosimetry program.

With our solution and our support, you will get easily and quickly ISO/IEC 17025 accreditation.

## LABORATORY EQUIPMENT "À LA CARTE"

LANDAUER offers you a wide range of options to design a dosimetry program customised to your requirements. For example, your organisation can either choose to process its own dosimeters, or entrusts all or part of the dosimetry process to LANDAUER such as extremity, lens of eye or neutron dosimetry services.



## OSLR READERS

OSLR readers are designed for use with InLight dosimeters for whole body, environmental and emergency response monitoring.

### All-in-one dosimeter reader

The OSLR reader works with the LANDAUER complete dosimetry system, a solution for onsite dosimetry using LANDAUER OSL technology. OSLR performs both reading and annealing process with very high throughput

### Quality, simply and with reliability

LANDAUER OSLR reader includes an external PC with menu-driven IRAS software. The software automatically captures bar-coded dosimeter serial numbers, which facilitates chain of custody. The reader and the software provide control over reader setup, analysis, database maintenance.

Quality Control (QC) procedures and data recording, enabling dosimeter readout, recording and the monitoring of reader performance - and providing you rapid, accurate radiation assessment that can help improve the efficiency and productivity of your program.

High quality components are used for durability and to insure repetitive and long term performances. All important components are automatically and periodically checked with built in QC procedures.

Traditional technics with internal radioactive source or external irradiator are no longer required. OSLR reader uses QC delivered samples, internal LED and photodiode to perform all QC tests

### OTHER FEATURES AND BENEFITS:

- No heating parameters to control
- No gas supply
- Fast reader throughput
- Simple calibration process
- Remote diagnostic and maintenance
- Dose assessment algorithm embedded
- Compatible with Windows 10

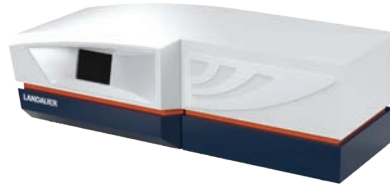
### Scalability

Three OLSR readers are proposed to adapt to the number of workers being monitored in your lab. Upgrading loader capacity during product life time is designed to be simple. For small laboratory, the manual reader microStar is also proposed

OSLR50 Automatic Reader



OSLR250 Automatic Reader



OSLR700 Automatic Reader



Desk-top model

300 dosimeters / hour

1 magazine / 50 dosimeters

1011x452x352 mm / 39.8x17.8x13.9 inch

50 kg / 110 lb

100 - 240 V - 1,5 A / 50 - 60 Hz

Desk-top model

300 dosimeters / hour

Up to 5 magazines / 250 dosimeters

1100x452x352 mm / 43.3x17.8x13.9 inch

73 kg / 162 lb

100 - 240 V - 1,5 A / 50 - 60 Hz

Desk-top model

300 dosimeters / hour

Up to 14 magazines / 700 dosimeters

1186x452x352 mm / 46.7x17.8x13.9 inch

85 kg / 187 lb

100 - 240 V - 1,5 A / 50 - 60 Hz

Operating Temperatures: +10 °C to +35 °C

Storage temperature: -10°C à + 60 °C, 30-70% N.C.

Protection index: IP40

## SOFTWARE AND ACCESSORIES

In addition to OSLR readers and annealers, LANDAUER provides software, accessories and support for organisations that require to operate their own in-house service or for other applications:

- IMLS software (Individual Monitoring Lab Software)
- Manual and automatic pin cutters
- Barcode readers
- Training and support

## INLIGHT DOSIMETER

InLight dosimeters are used for occupational, area/environmental, and emergency response monitoring, in any kind of facilities.

- **Robust, compact and lightweight dosimeter**
- **Fully personalised and customizable**
- **A new detection system**  
The dosimeter InLight is based on a new detector and a new generation of dose equivalent estimation algorithm. With InLight, you get a more accurate estimation of the dose equivalent at very low doses.
- **Higher performances**  
InLight complies with all of the EN 62387:2016 standard. Its characterisation by an independent laboratory (LNHB) shows metrological performances higher than the standard requirements.



### General characteristics

<b>Manufacturer</b>	LANDAUER
<b>Radiation measured</b>	Photons (X- and gamma rays) and beta
<b>Detector</b>	New detector, GA or GN type
<b>Materials</b>	Aluminium oxide, doped with carbon, Al <sub>2</sub> O <sub>3</sub> :C
<b>Filters</b>	Open window, aluminium, titanium, tin
<b>Dimensions without clip</b>	35 mm x 74 mm x 10 mm
<b>Weight</b>	17 g
<b>Dosimeter identification</b>	1D / 2D barcode
<b>Operational dose quantities</b>	H <sub>p</sub> (10), H <sub>p</sub> (0.07), H'(10)



GA detector

- Detector filters
- Open window
  - Aluminium
  - Titanium
  - Tin



### Specifications

	Result of the InLight dosimeter		
	Whole body and wrist		Area
Type of measured radiation	Photons	Beta	Photons
Personal dose equivalent	H <sub>p</sub> (10) and H <sub>p</sub> (0.07)	H <sub>p</sub> (0.07)	H*(10)
Dose range	0.05 mSv to 10 Sv		
Linearity response	0.05 mSv to 10 Sv - Standard deviation < 5 %		
Measurement reproducibility	< 5 %		
Energy response (mean energy)	H <sub>p</sub> (10): 15 keV to 6 MeV H <sub>p</sub> (0,07): 15 keV to 1.33 MeV	0.24 to 0.8 MeV (E <sub>mean</sub> )	24 keV to 1.33 MeV
Energy dependency	better than 11 % from 15 keV to 6 MeV		
Angular response (horizontal and vertical angles)	H <sub>p</sub> (10): ± 60° from 15 keV to 6 MeV H <sub>p</sub> (0,07): ± 60° from 15 keV to 1.33 MeV	± 45° from 0.24 to 0.8 MeV (E <sub>mean</sub> )	± 60° from 24 keV to 1.33 MeV
Angular dependency	Excellent - Average deviation < 6 %*		
Fading	< 1.5 % / month		
Neutrons detection	Insensitive to neutrons		

\* Average gap beside the true response

### Environmental resistance characteristics

<b>Operating and storage temperature</b>	-10 °C to 40 °C
<b>Humidity</b>	0 % à 90 %
<b>Light exposure</b>	Tested up to 1,000 W/m <sup>2</sup> - Compliant with the standard requirements.