

RadPro International GmbH

...Radiation Protection for the Radiation Professionals...



Your provider for complete TLD systems

We supply full spectrum of TLD-readers, TLD-materials, dedicated equipment and software.

RadPro International GmbH

Burger Straße 28

42929 Wermelskirchen

Germany

Phone: +49 2196 889803

E-mail: sales@radproint.de

Web: www.radpro-int.com

TLD Reader

RE-2000 Series (from Mirion Technologies (Rados) Oy) Multi-purpose TLD Reader for your needs



RE-2000 is an universal, low cost and high precision TLD-reader for automatic or manual processing of dosimeter cards and single chips.

The reader can automatically process up to 200 dosimeter cards or 800 single TL-elements at one load depending on the model. The maximum processing speed is 160 single elements per hour. The photon counting method used over the whole measurement range provides an excellent signal to noise ratio for the measurement. Cooled PMT and built in self diagnostics guarantee high measurement stability and an error free operation.

FEATURES

- Evaluation of whole body, extremity, beta, gamma, x-ray and neutron doses in single or mixed fields
- Hole code or bar code identification of the dosimeter card
- High measurement reproducibility with standard industrial N₂ heating
- Fully programmable pre-heat, measurement and anneal cycles
- Automatic element-sensitivity correction, background subtraction and pre- and post calibration capability with WinTLDpro application software (see below).

3 different models available:

- **RE2000A:** Automatically process up to 200 dosimeter cards or 800 single TL-elements at one load
- **RE2000S:** Automatically process up to 20 dosimeter cards or 80 single TL-elements at one load
- **RE2000RT:** Automatically process up to 20 dosimeter cards or 80 single TL-elements at one load including TL-Rods

TLD Cards



RADOS TLD Dosimeter

(from Mirion Technologies (Rados) Oy)
for RE-2000 Readers

RADOS Thermoluminescence Dosimetry system covers a wide range of applications:

RADOS TLD System includes all the components needed for easy and accurate Personal Dosimetry.

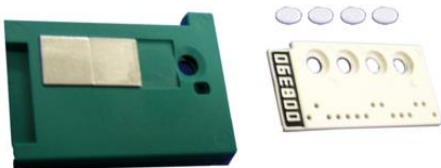
Easy adaption of high sensitive TL-materials and low noise photon counting measurement method makes the RADOS system extremely suitable for environmental dosimetry.

Ingenious dosimeter card construction and high measurement range bring the advantages of an automatic reader to clinical dosimetry applications.

The RADOS badge design allows the exchange of filter materials, filter thickness and TL materials. This is both to satisfy the needs of different applications and also to offer the possibility of applying new TL-materials easy.

The standard TLD dosimeter card consists of a coded slide placed in a slide holder, with or without filters, and carried inside the dosimeter cover.

The slide has four positions for the detectors (pellets, chips or rods). The detectors are not attached to the slide positions and any required number of positions up to four can be used. This makes it possible to handle the elements separately (e.g. extremity or clinical dosimetry).



TLD Material



TLD Materials (from RADCARD, former TLD-Poland)

Probably the best TLD's in the world

Lithium fluoride thermoluminescent phosphor, in the form of powder, solid pellets and chips, is recognized universally as the "golden standard" for applications in radiation protection dosimetry, monitoring of environmental radiation and medical dosimetry.

MTS-N

MTS-N (LiF:Mg,Ti) has been produced since 1972 in the form of solid pellets, chips and powder, using unique method developed by Prof. Tadeusz Niewiadomski at the Institute of Nuclear Physics, Krakow, Poland.

- Fully exchangeable with with LiF:Mg,Ti phosphors, chips and pellets produced by other companies,
- Used world-wide in radiation protection, environmental monitoring and clinical dosimetry.

MCP-N

MCP-N type ultra sensitive thermoluminescent LiF doped with magnesium, copper and phosphorus (LiF:Mg,Cu,P), available as solid detectors or in the form of powder.

- 30 times more sensitivity to gamma ray doses than MTS-N
- Unmatched for environmental monitoring and personal dosimetry.

TLD-Powders

TLD Powders for dosimetry in medical physics:

- Beam dosimetry
- TLD Quality Assurance for postal reference dosimetry
- Typical grain size 80 – 200 μm (customer specified)

MCP-Ns

MCP-Ns (LiF:Mg,Cu,P) thin active-layer ultra-sensitive TLD designed to measure $H_p(0.07)$ in external fields of weekly penetrating radiation. Each pellets consists of a thin radiation-sensitive part, of $8.5 \text{ mg}\cdot\text{cm}^2$ effective thickness, bonded to a thick, mechanically stable, non luminescent LiF matrix.

- Flat energy response after X-ray and β -ray doses
- High sensitivity-reliable measurements of $H_p(0.07)$ in the μGy range

Tailored to your needs

The unique feature of our company is an ability to produce detectors of dimension, active-layer thickness, isotopic composition and sensitivity, adjusted to any individual requirement of our Customers.

- Available shapes: pellets, square chips, round-corner chips, micro-cubes and rods
- Available dimension: diameter 1 – 12 mm, thickness 0.3 – 1.5 mm
- Chips and pellets available sealed in fluoro-polymer foil (e.g. PTFE)
- Our miniature detectors are ideal for high spatial resolution dosimetry
- We can vary the effective thickness of the sensitive layer in our MCP-Ns detectors from $7 \text{ mg}\cdot\text{cm}^2$ to $1000 \text{ mg}\cdot\text{cm}^2$
- Read out with any standard TL reader (planchet or hot gas) as bare detectors or in dosimetric cards

TLD Finger rings



TLD finger ring dosimeter for all applications in extremity dosimetry

- Comfortable to wear
- Usable under surgical gloves
- Officially approved by the PTB disinfectable and cold sterilizable
- Perfect radiation protection, inexpensive, leading in technology

Two different types available:

Type G:

Radiation: photon radiation
Dose units: Hp(0.07) in mSv and Sv
Photon energy: 10 keV to 1,4 MeV

Type BG:

Radiation: beta and photon radiation
Dose units: Hp(0.07) in mSv and Sv
Beta energy: > 50 keV
Photon energy: 7,6 keV to 1,4 MeV

EYE-D



Eye lens TLD dosimeter the best solution for monitoring of Hp(3) doses.

Actual studies show a significant risk of radiation induced eye lens cataracts among people exposed to low dose x-rays and scattered radiation. Measurement of eye dose is imperative in many areas.

Fields of application:

- Interventional radiology
- Nuclear medicine
- Medical diagnostics
- Nuclear Industry

Simple, precise, reliable, tailored to your needs

H*(10) Dosimeters



H*(10) - Environmental dosimeters Gamma-Sphere & DORIS for environmental dosimetry

The environmental equivalent dose is intended to serve as a good approximation for an effective dose for a person who is positioned facing any direction within measuring range of the radiation field.

In contrast to the old photon dose equivalent Hx there is now the environmental equivalent dose H*(10), defined on a phantom at 10 mm depth in the ICRU-sphere (International Commission on Radiation Units and Measurement).

While the Gamma-Sphere is used with two loose TLD chips or discs, Doris can either be equipped with aluminum TLD cards or RADOS TLD cards.

TLD Cards



TLD Aluminium Cards

(from RADCARD)

Multi-element Al-dosimetric cards

Our aluminium dosimetric cards, with TL pellets or chips sealed in fluoro-polymer (e.g. PTFE), can be evaluated in all compatible hot-gas readers. One to four detectors in arbitrary configurations and sealed fluoro-polymer foil are mounted into the card. Different shape, thickness and isotopic composition of detectors (^7Li , ^6Li , natural Li), different colors and card numbers are available on request.



Genesis Card-Holder

(from Mirion Technologies (GDS) Inc).

Genesis is a card holder for Al-dosimetric cards

The Genesis allows for reporting of deep, lens of eye and shallow doses, and has a thin Mylar window for detection and measurement of low energy beta radiation.

Applications

- Any occupational worker with potential exposure to gamma, X-ray, beta and/or neutron radiation.
- Nuclear medicine facility, imaging centers and research diagnostic centers and all employees with potential exposure to gamma, X-rays and beta.
- Nuclear power plant workers, research laboratories, hospitals, universities and industrial applications.

“Other types on request”

Albedo Cases



Albedo Neutron Dosimeter Cases

Dosimeter cases for personal dosimetry of thermal neutrons in use with different TLD-cards

The Albedo neutron dosimeters are used for individual monitoring of personal exposure to thermal neutron radiation. The boron plastic capsules make it possible to measure the thermal neutron backscatter from the body of the wearer and the thermal neutrons from the radiation field.

The neutron dose equivalent in the range above 0.03 mSv can be estimated within $\pm 30\%$. Thermoluminescent detectors in cards are placed in the Albedo dosimetry cases for measurement and then read out by an automatic TLD reader.

Four types of Albedo dosimeter cases are available to accommodate the TLD cards of different TLD card manufacturers.

The opening device is required to open the cases for insertion and removal of the TLD cards. Two types of optional clips with plastic loop are available to attach the cases to the clothing.

Manual TLD Reader



TLD Cube

NEW Manual TLD-Reader

TLD Cube is a small, lightweight and portable TLD Reader for measuring, analyzing and evaluating of thermo luminescent materials. Modern design and software combine easy operation and excellent performance in this newly developed reader. The ceramic heater with defined nitrogen cooling in the rotating drawer accepts all standard TLD shapes.

TLD Cube is available in two versions as TLD Cube 400 with heating capability up to 400°C and as TLD Cube 600 which provides heating capabilities up to 600°C.

The software includes calibration and QA features, data storage and export options as xml file or Excel file to meet all typical requirements.

Analysis, research and TL measurements

- Radiation protection
- Medical Dosimetry
- Experimental physics
- Environmental research
- Personnel Dosimetry
- Geoarchaeology - dating
- Checking irradiated food

Irradiator



IR-200

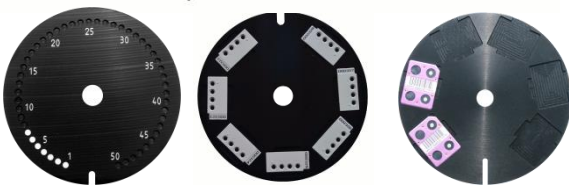
Table Top irradiator

Compact and versatile

The TLD Irradiator IR-200 is a multi-purpose irradiation system. The device requires only little space on the table. It is used for calibration purposes of TLD elements or TLD cards.

Different carrier discs are available for the irradiation of different TLD elements like rods, chips and discs, as well for aluminum TLD cards and TLD Slides type "Rados". The irradiation value is defined by the number of carrier disc revolutions.

The IR-200 contains a 90Sr/90Y radiation source with an activity of 33 MBq.



N₂ Generator

Nitrogen Generator

Supplies 5 l/min of Nitrogen, with 100 ppm purity, including compressor and dust filter. Output pressure 5 bar.

Suitable for TLD Reader model RE-2000 or others.

Line voltage: 120V 60Hz or 230V 50/60Hz



TLD Oven



TLD Heat

TLD annealing oven for thermoluminescent dosimeters

The TLD annealing oven TLD Heat has specially been developed for thermoluminescent dosimetry. It is used for the annealing of TLDs before irradiation and for preheating after irradiation and before reading by a TLD reader.

The stainless steel heating chamber with air circulation is characterized by its excellent temperature uniformity. Reproducible heating and cooling cycles are essential for thermoluminescent dosimeters to maintain constant sensitivity and low background readings.

TLD Heat is suitable for annealing of all typical TLD elements like chips, discs and rods. TLD Annealing Oven is supplied with a stainless steel annealing tray and a cool block for rapid cooling. It has a PC interface and Win software for easy and flexible programming and saving of any required heating profile for preheat and anneal of TLD material to a maximum temperature of 400°C.

Phantoms



RSD ART Phantom

THE ALDERSON RADIATION THERAPY PHANTOM (ART)

The Worldwide Standard for Quality Assurance for Radiation Therapy

The Alderson Radiation Therapy phantom (ART) and its earlier version, the Alderson RANDO phantom, have been in use for over 30 years. The ART has been refined and improved in both design and materials.

These phantoms are indispensable quality-assurance tools; about 10,000 are in use all over the world. They provide integrated tests of the entire chain of treatment planning and delivery.

ART phantoms are molded of tissue-equivalent material; they are designed within highly sophisticated technological constraints and follow ICRU-44 standards. They are also designed for accuracy and ease of use.

“Other RSD phantom models on request”

RadPro International GmbH

...Radiation Protection for the Radiation Professionals...

Email: sales@radpoint.de

Web: www.radpro-int.com