



**RÉPUBLIQUE  
FRANÇAISE**

*Liberté  
Égalité  
Fraternité*

**IRSN** [DOSIMÉTRIE

INSTITUT DE RADIOPROTECTION  
ET DE SÛRETÉ NUCLÉAIRE



## THE TLD RING DOSIMETER



**GUARANTEED COMFORT, ADAPTABILITY AND  
HYGIENE FOR UNIQUE PERFORMANCE  
IN EXTREMITY DOSIMETRY**

The risk of a person exposing their hands to ionising radiation is clearly identified in certain work-related activities; it requires that suitable specific dosimetry monitoring is put in place.

The TLD ring dosimeter developed by the IRSN is the optimum monitoring solution.

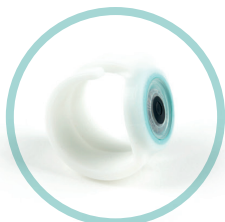


- > **Clear identification of the wearer**
- > **Adaptable single size**
- > **Ultra flat ring**
- > **Guaranteed comfort and hygiene**

## ERGONOMICS AIMED AT ACHIEVING PERFORMANCE

- ⊕ The TLD ring dosimeter adapts to all finger diameters, using a unique self-adjusting ring concept.
- ⊕ The ring is made of a flexible plastic material which provides essential comfort in daily use.
- ⊕ Its smooth, ultra-flat design makes it easy to clean and compatible with cold decontamination operations and allows gloves to be put on and taken off easily.
- ⊕ The wearer is identified by indelible laser marking on the ring (wearer's surname and first name, place of use, length of time worn and dosimeter number).

**Note:** indication of the hand (R or L) and/or the finger (2, 3 or 4, R or L) wearing the ring is possible.



## UTILISATION

The IRSN ring dosimeter is the best way to assess the dose received by a worker's fingers and to ensure that it is compliant with the annual permitted 500 mSv limit.

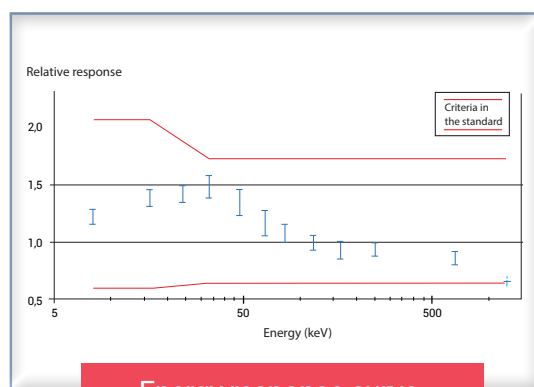
- ⊕ The ring dosimeter is suitable for dosimetric monitoring in all fields: medical, industrial nuclear and non-nuclear, research, etc.
- ⊕ The length of time for which ring dosimeters are worn may be monthly or quarterly (including non-calendar quarters).
- ⊕ It is also an essential tool in certain work station studies.
- ⊕ In certain cases (studies) several rings may be used by a single user (right hand, left hand, right index, left ring, etc.). The hand and/or finger may be marked on the ring.

## PRINCIPE

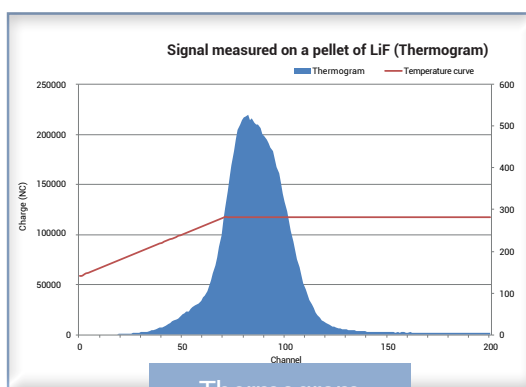
This dosimeter uses Thermoluminescence Dosimetry (TLD) technology.

Luminescence qualifies all physical processes emitting light. In the case of the TLD ring dosimeter, luminescence is produced by the heating of lithium fluoride (LiF), previously exposed to ionising radiation. During X,  $\gamma$  or  $\beta$  radiation, electrons are torn from the structure of the detector, and trapped by impurities contained in the material. The luminescence created by heating the TLD detector is proportional to the number of trapped electrons and therefore to the dose received by the dosimeter.

The detector used is a type 7LiF: Mg,Ti. Its energy response complies with standard IEC 62387: 2012 for photons going from 8 keV to 1.25 MeV (see graph below)



Energy response curve



Thermogram

RADIATION	ENERGY RANGE *	DOSE RANGE *
PHOTONS (X, $\gamma$ )	From 8 keV to 1.25 MeV	From 0.2 mSv to 10 Sv
BETAS	> 0.8 MeV	From 0.8 mSv to 500 mSv

\* These values are not in any way limits on the use of the TLD ring dosimeter; they are limits guaranteeing conformity with IEC standard 62387: 2012.

