

Extremity dosimeters are invaluable for personal dosimetry throughout the industrial, nuclear, medical and research industry, wherever radionuclides are handled. Extremity dosimeters are used for measuring skin dose at the tip of the finger during operations that involve high dose gradients, where ring, wrist or whole body dosimeters are not adequate to measure the dose accurately. These dosimeters may also be used for patient skin monitoring during radiotherapy procedures.

## Finger-Tip Dosimetry

Dosimetry at Your Fingertips

Reusable Finger-Tip Extremity Dosimeter



### Benefits

- Easy to use
- Uniquely identifiable
- Rugged and sealed against moisture and contamination
- Reusable dosimeter element
- Economical
- Readable in all Thermo Scientific whole-body readers

The Thermo Scientific extremity finger-tip dosimeter has been designed to meet the requirements for the ideal finger-tip extremity dosimeter. The active element is situated at the finger tip providing the closest possible position to the radiation source being handled. This dosimeter has been approved for use by the UK HSE and meets ISO 12794.

To achieve this performance a fine layer of TLD-700H powder has been deposited on a Kapton® substrate. Each dosimeter includes a unique and permanent barcode number for identification purposes and complete chain of custody. The dosimeter is capable of being heat sealed to prevent intrusion of contaminants.

The combination of a very thin layer of TLD-700H powder together with the thin window provides an exceptionally good response to photons and betas.

### Applications

- At the glove box face
- In fuel-handling cells
- During fuel rod assembly
- Re-fuelling
- Clean-up operations and waste handling
- De-commissioning
- Radiochemistry
- Cyclotron source preparation
- Radiopharmaceutical production
- Nuclear medicine
- Radiology and radiotherapy

## Finger-Tip Dosimetry

Specification	
Material	TLD-700H LiF: Mg, Cu, P 7 mg/cm <sup>2</sup>
Window Thickness	XD-707H Beta: 3.2 mg/cm <sup>2</sup> XD-707H Photon: 10 mg/cm <sup>2</sup>
Fade – up to 6 months	Negligible
Photon Energy Response	< ±20%, normalized to 137Cs
Photon Angular Response	< ±5% up to 90°, normalized to 0°
Beta Energy Response	XD-707H Beta: -20% for 147Pm; +20% for 90Sr/Y; normalized to 137Cs XD-707H Photon: -80% for 147Pm; +20% for 90Sr/Y; normalized to 137Cs
Beta Angular Response	< ±10% up to 60°, normalized to 0°
LLD	Less than 6 mrem (60 iSv) up to 200 days
Cleaning Solvents	No significant effect was observed when rubbing alcohol-based hand wash was applied to bare detectors for five seconds
Seal	No significant effect after immersed six hours in water

### Finger Stalls

There are two types of finger-tip dosimeters in two pouch sizes. The two types of dosimeters are Photon and Beta. The Photon type has a black polychloroethene front covering the TLD element, which has a higher density suitable for photons and high energy betas and more rugged for harsh environments. For photons and low energy betas a Beta dosimeter is available. This dosimeter has an aluminized polyester layer over the TLD element. Angular performance of the two dosimeters is shown in the accompanying figures. Complete testing of these dosimeters are documented in the paper "Type Testing of an Extremity Finger Stall Dosimeter Based on Harshaw TLD EXTRAD Technology."<sup>1</sup>

The finger-tip dosimeters come in two sizes, standard and large. They are heat sealable to protect the active TLD element. The Chipstrate™ barcode is readable while sealed in the pouch.

The active Chipstrate element is ideally situated at the finger-tip. The dosimeter is the natural choice for users requiring accurate finger-tip dosimetry in a low-cost and reusable format.

A Chipstrate is sealed into the plastic outer pack and then issued to the wearer. Upon return from the user the Chipstrate is removed from the plastic pouch and readout in the TLD reader. After reader evaluation the Chipstrate may be used again and reissued to another user. The pouches are discarded to prevent cross contamination. The Photon type may be cold sterilized before issue to the user or during use.

<sup>1</sup>Radiation Protection Dosimetry (2006), 1 of 8, doi:10.1093/rpd/ncl382

### Highlights

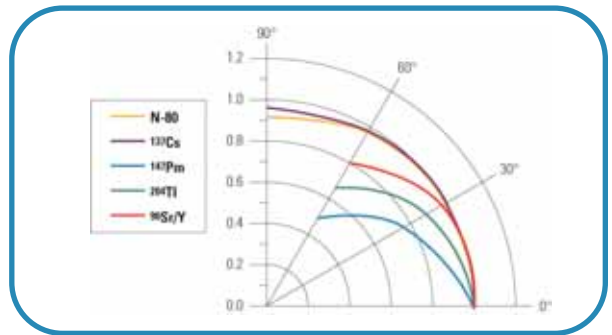
These finger-tip dosimeters have many benefits that improve your operation. Some of these benefits are:

- Readable up to 50 times
- Negligible fade over a six-month issue period
- Flat energy and angular response

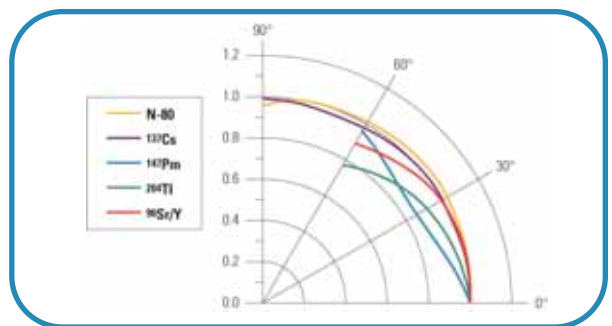
### Product Ordering Information

Description	Beta	Photon
Standard Finger Pouch	500753	500755
Large Finger Pouch	500754	500756
Chipstrate (XD-707H) with 5-digit barcode	26978	
Chipstrate (XD-707H) with 7-digit barcode	26978-1	
Chipstrate (XD-707H) with 7-digit high temperature barcode	26978-2	

### Angular Dependence Normalized to 0°—Photon Type



### Angular Dependence Normalized to 0° — Beta Type



©2007 Thermo Fisher Scientific Inc. All rights reserved. Kapton is a registered trademark of E.I. du Pont de Nemours and Company. All other trademarks are the property of Thermo Fisher Scientific Inc. and its subsidiaries. Results may vary under different operating conditions. Specifications, terms and pricing are subject to change. Not all products are available in all countries. Please consult your local sales representatives for details. Literature Code LITFINGERCOT 0507

Worldwide  
Frauenauracher Strasse 96 +49 (0) 9131 909-0  
D 91056 Erlangen, Germany +49 (0) 9131 909-205 fax

United Kingdom  
Bath Road, Beenham, +44 (0) 118 971 2121  
Reading RG7 5PR United Kingdom +44 (0) 118 971 2835 fax

United States +1 (508) 520-2815  
27 Forge Parkway +1 (800) 274-4212 toll-free  
Franklin, MA 02038 USA +1 (508) 428-3535 fax

[www.thermo.com/rmp](http://www.thermo.com/rmp)

**Thermo**  
SCIENTIFIC