



The Personal Dosimetry Service of Public Health England provides eye dosimetry based on alternative forms of thermoluminescence dosimeter (TLD): the whole body TLD and the headband dosimeter. The dosimeters are designed to measure doses from gamma and X-radiations to the lens of the eye in terms of the radiation quantity $H_p(3)$, the dose equivalent at a depth of 3 mm, as required by the Health & Safety Executive (HSE). In addition, the headband type measures doses from beta radiations.

The dosimeters are issued as part of the PHE TLD dosimetry service, which is approved by the HSE under Regulation 36 of the Ionising Radiations Regulations 2017. For both types, the dosimeter elements are produced by Harshaw TLD™, part of Thermo Fisher Scientific, and are individually bar coded.

Whole body TLDs for measuring doses to the whole body and skin are described in a separate data sheet. They can also measure doses to the lens of the eye if:

- they are worn on the collar **and**
- the radiation field is known to be the same at the collar as it is at the eyes **and**
- doses are only from photons (gamma and X-radiations)

Headband dosimeters are provided in a single, adjustable format which will accommodate a range of head sizes.

The dosimeter element is of the Harshaw EXTRAD™ type, and is enclosed behind a 1.5 mm PTFE filter in a sealed PVC pocket. The headband is fastened by means of Velcro™ strips which can be trimmed to length. The headband dosimeter measures $H_p(3)$

from both photons and betas and should be preferred if:

- the radiation field in the vicinity of the eyes is not well known **or**
- doses may arise from beta radiations

Thermoluminescent materials store the energy they absorb from ionising radiation until they are heated – in this case to about 250°C – when the energy is released as light. The amount of light released is proportional to the radiation dose. When the dosimeters are returned for processing, they are fed into an automated TLD reader which identifies the dosimeter, heats it to the required temperature and measures the light output.

The dosimeters must be used facing in the correct direction: in the case of the whole body TLD, the open windows should face the predominant radiation source, and in the case of the headband dosimeter, the white PTFE filter (not the bar code) should face the source.



Whole body TLD



Headband dosimeter

Eye dosimeters are provided as part of the range of approved dosimetry services offered by Public Health England. Our dose measurement services are linked to our dose record keeping service via an automated system. The processing laboratory is based at our centre at Chilton. For further information or to place an order please contact us on the numbers below.

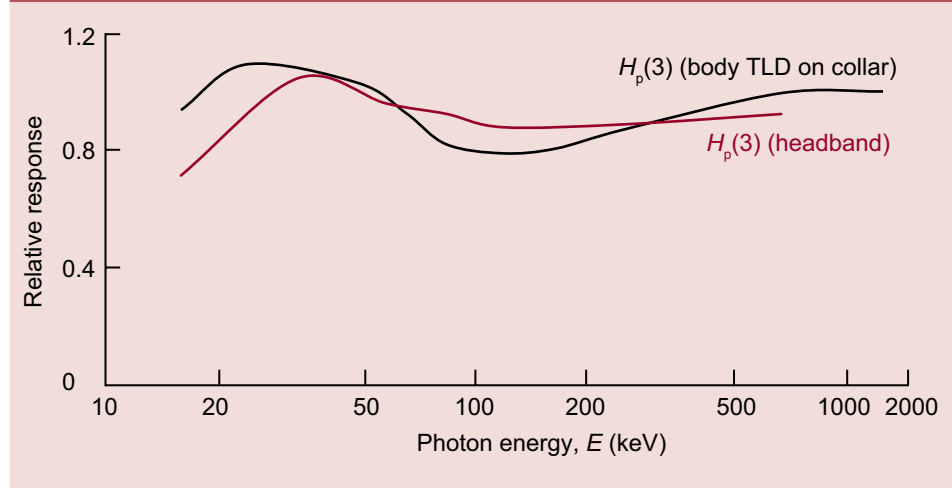
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Technical Specification

Material	^7LiF (Mg,Cu,P)	
Change interval	Standard periods of 1, 2 or 3 months Periods of 2, 4, 8 or 13 weeks also available	
	Whole body TLD	Headband dosimeter
Radiation types	γ (gamma) and X-radiations	γ , β (beta) and X-radiations
Dose range	0.05 mSv to 10 Sv	0.05 mSv to 10 Sv
Energy range (photons)	16 keV to at least 662 keV	16 keV to at least 662 keV
Energy range (betas, E_{max})	NA	1.7 MeV to at least 3.5 MeV
Angle of incidence range	0° to 60° from normal	0° to 45° from normal

Energy response



Measurement uncertainties

The dosimeters are subject to measurement uncertainties which comply with the recommendations given in European Commission report *Radiation Protection 160: Technical Recommendations for Monitoring Individuals Occupationally Exposed to External Radiation*.

Special Features

Environmental effects

The dosimeters may be worn in all normally encountered environments. In tests, no effect was found for 48 hours' exposure at 40°C and 90% relative humidity. Prolonged exposure to strong ultraviolet light (including sunlight) should be avoided.

Size to suit all

The headband dosimeter is adjustable, to suit a wide range of users.