# **Dosimeter Designation: InLight Environmental Dosimeter**

### A. Technical Description:

The InLight Environmental Dosimeter is designed for monitoring environmental radiation exposure. The badge consists of a waterproof plastic envelope, which is sealed closed to hold a dosimeter and label, Figure 1. The front of the dosimeter is shown on the left.





The dosimeter consists of a case that contains metal and plastic filters and a plastic slide containing that contains detector elements, Figure 2. The detector element is a layer of  $Al_2O_3$  sandwiched between two layers of polyester for a total thickness of 0.3 mm. Optically Stimulated Luminescence (OSL) is the method of analysis applied to the detector.



Figure 2: InLight Dosimeter

### **B. Holder Description:**

Size: Rectangular design 6.3cm X 4.5 cm X 0.6 cm thick Constructed of PVC plastic, RF sealed and waterproof. Formulated to meet -10°F impact testing.

### C. Dosimeter:

Size: Rectangular design 5cm X 2.4cm X 0.6cm thick Constructed of polystyrene plastic

### FRONT

				Thickness (mg/cm <sup>2</sup> )				
Dosimeter Element	Density (g/cm <sup>3</sup> )	Thickness (mm)	Thickness (10 <sup>-3</sup> in)	Open Window	Plastic	Copper	Copper	_
Waterproof PVC Cover	1.406	0.3	12	42.2	42.2	42.2	42.2	
2 mil Polyester Beta Window	1.26	0.05	2	6.3	0.0	0.0	0.0	
Plastic Filter Polyester	1.26	0.7	28	0.0	88.2	0.0	0.0	
Copper	8.96	0.4	16	0.0	0.0	358.4	358.4	
Polyester Substrate	1.26	0.1	4	12.6	12.6	12.6	12.6	
			Total	61.1	143.0	413.2	413.2	

#### BACK

				Thickness (mg/cm <sup>2</sup> )			
Dosimeter Element	Density (g/cm <sup>3</sup> )	Thickness (mm)	Thickness (10 <sup>-3</sup> in)	Open Window	Plastic	Copper	Copper
Waterproof PVC Cover	1.406	0.3	12	42.2	42.2	42.2	42.2
External Strap Holder	1.406	0.25	9	35.2	35.2	35.2	35.2
Label (polypropylene)	0.9	0.05	2	4.5	4.5	4.5	4.5
Label (flexo film varnish)	0.93	0.03	1	2.8	2.8	2.8	2.8
2 mil Polyester Beta Window	1.26	0.05	2	6.3	0.0	0.0	0.0
Plastic Filter Polyester	1.26	0.7	28	0.0	88.2	0.0	0.0
Copper	8.96	0.4	16	0.0	0.0	358.4	358.4
Polyester Substrate	1.26	0.1	4	12.6	12.6	12.6	12.6
			Total	103.5	185.4	455.6	455.6

### D. Identification:

The back of the dosimeter contains a label printed with the wearer name, series code, account name and/or wear date. Each dosimeter packet has an identification number.

## E. Analysis Equipment:

Landauer manual and automatic InLight (OSL) readers consisting of a LED stimulation array, photon-counting system, and associated fixtures.

## F. Detection Capabilities:

- a. Photons (X and gamma rays) with energies above 15 keV nominally: 1 mrem to 1000 rem.
- b. Beta particles with energies greater than approximately 500 keV average energy: 20 mrem to 1000 rem.
- c. Meets or exceeds requirements of ANSI N545 1977, NRC Regulatory Guide 4.13, and HPS N13.29 Draft Standard for environmental dosimetry.