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National Dosimetry Services

InLight Nova OSL Dosimeter Technical Specifications



Dosimeter Overview

InLight Nova dosimeters provide X-ray, gamma and beta radiation monitoring using optically stimulated luminescence (OSL) technology. Each InLight Nova dosimeter is shipped to the client fully assembled in a dosimeter holder labelled with the wearer's name, the wearing period start and end dates, group number, wearing location and a dosimeter serial number.

OSL is a passive dosimetry technology. A passive dosimeter contains sensitive elements that absorb and store energy as the wearer is exposed to ionizing radiation. When the dosimeter is processed, the stored energy is released as light, which is measured. The reported radiation dose is proportional to the amount of light that is measured.

The InLight Nova dosimeter contains four OSL elements, each made of crystalline aluminum oxide doped with carbon (Al₂O₃:C) that has been crushed into powder and sandwiched between two thin plastic sheets. Each OSL element is positioned between a pair of filters made of a different material (thin mylar plastic, thick plastic, aluminum, and copper). These filters provide a different degree of screening to each element, so that ratios of element readings can be used to identify what kind of radiation the dosimeter has been exposed to.

Dosimeter Reading Equipment

InLight Nova dosimeters are processed using automated readers. During readout, each OSL element is stimulated using a strong beam of LED light to luminesce (or release stored energy as light). A wavelength filter is used to separate the stimulation light from the released light, and a photomultiplier tube is used to record the luminescence signal.

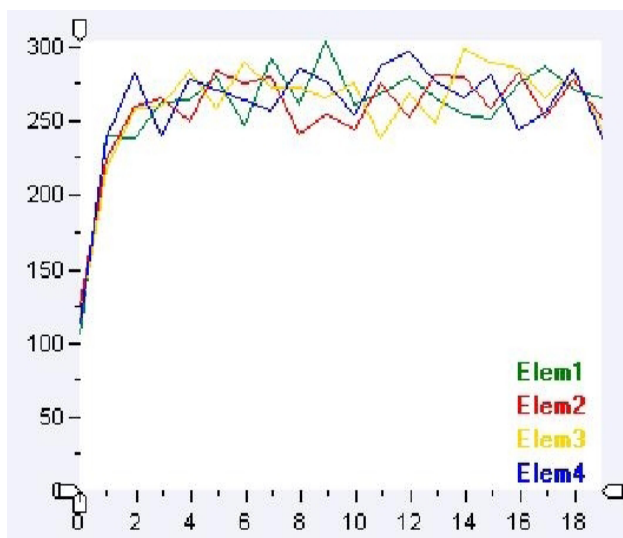


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Dose Analysis Process

National Dosimetry Services technologists carefully review the signals recorded from each InLight Nova dosimeter to ensure accuracy. A dose calculation algorithm is then applied to the signals. The algorithm uses ratios of element readings to characterize the energy of the incident radiation, and then uses this information to select conversion factors that can be applied to the readings to determine radiation doses. This process ensures accurate dosimeter readings over a very wide range of radiation energies.

Next, the doses are converted to occupational doses by subtracting contributions from environmental background radiation. These contributions are determined using control dosimeters and other sources of information about background radiation levels at client work sites. Finally, the occupational doses are reported to the National Dose Registry and an Exposure Report is mailed to the client.



Accreditations

- ➔ Canadian Nuclear Safety Commission (CNSC)
- ➔ All Provincial and Territorial regulatory bodies

Technical Specifications

Dosimeter Name	InLight Nova OSL Dosimeter
Dosimeter Type	Passive
Radiation Detected	X-ray, Gamma and Beta
Wearing Location	Whole Body
Doses Reported	Hp(10), mSv (“Deep Dose” or “Body Dose”) Hp(0.07), mSv (“Shallow Dose” or “Skin Dose”)
Energy Response	Photon (X-ray and Gamma): 20 keV to in excess of 6000 keV Beta (Max): 687 keV to in excess of 2274 keV
Reporting Threshold	0.10 mSv