

QA/QC PROGRAM DEVELOPED FOR ENVIRONMENTAL MONITORING IN-HOUSE APPLICATIONS USING TLDs.

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Thermoluminescent dosimetry (TLD) is widely used for environmental monitoring. Dosimetry measurements are an important component of the program and must be of high quality. To ensure accurate and reliable measurements, quality assurance/quality control (QA/QC) procedures must be established, reviewed and followed. Dosimetry performance tests and QA procedures are outlined in ANSI documents such as N545, N13.29 and N13.37. The program includes calibration of the TLD reader (TLD-4000) using traceable radiation standards and annealing and sensitivity checks for the dosimeters. The operating parameters of TLD reader were controlled with internal checks creating constant measurement conditions. Overall system performance assessed using control dosimeters exposed to known amounts of radiation. This program led to improvements in the elements of TLD system (detector, reader and measurement cycle). Measurement cycle includes annealing, package and storage, irradiation, readout and mathematical evaluation. The main characteristics tested for TLDs are batch homogeneity, sensitivity, reproducibility, linearity, light sensitivity, fading and energy dependence. Thus, the influence of this program will be appeared in precision of dose assessment especially in low doses of environmental exposures.

Keywords: QA/QC program; TLD; ANSI documents; environmental monitoring.