



CR-39 Fast Neutron



CR-39 Fast/Intermediate/  
Thermal Neutron

### Track Etch Technology

The CR-39 is processed with Track Etch technology. During analysis in our laboratory, the CR-39 is etched for 15 hours in a chemical bath to enlarge exposure tracks. The fast neutron dose is measured by counting the tracks generated as a result of the proton recoil with the polyethylene radiator, while the thermal neutron dose is measured by counting the alpha tracks generated with the boron radiator.

LANDAUER Neutrak dosimetry service provides neutron radiation monitoring with CR-39® and Track Etch® technology. The Neutrak detector is a CR-39 (allyl diglycol carbonate) based, solidstate nuclear track detector that is not sensitive to x, beta or gamma radiation and can be packaged specifically for neutron detection only or as a component of another dosimeter such as Luxel®+ or InLight® to include x, gamma and beta radiation monitoring. The CR-39 is laser engraved for permanent identification and wrapped with a 2-D bar code to assure efficient chain-of-custody.

LANDAUER's comprehensive full service includes automatic exchange out of dosimeters for each wear period, processing and analysis, data management, reporting of exposure results, direct computer access via the Internet to LANDAUER's database for shipment tracking and customer service and technical support programs.

### Design

Neutrak dosimeters span the full spectrum of energies found in neutron environments. **LANDAUER offers two neutron dosimeters: a fast neutron dosimeter and a combination fast, intermediate, thermal neutron dosimeter.** Neutrak's fast neutron dosimeter uses a polyethylene radiator for fast neutrons that records recoil protons resulting from neutron interactions in the dosimeter. Neutrak's thermal/intermediate neutron dosimeter has a design intended for fast, intermediate and thermal neutrons. The left area of the chip uses a polyethylene radiator for fast neutrons while the right area uses a boron loaded Teflon® radiator for fast, intermediate and thermal neutrons that records alpha particles resulting from neutron interactions in the dosimeter.



The Neutrak dosimeter packaged in a vinyl pouch specifically for neutron detection only



The Neutrak dosimeter can be sealed inside the Luxel+ plastic blister pack



The Neutrak dosimeter can be enclosed inside the InLight holder

## Neutrak Dosimeter Selection Guide

	Fast Neutron	Fast, Intermediate and Thermal Neutron
<b>Typical Applications</b>	Monitoring personnel working with unmoderated or moderately shielded fast neutron sources such as Californium-252 and Americium-241 Beryllium	Monitoring radiation near graphite-moderated neutron sources or monitoring requirements that involve exposure to low, high or varying mixtures of neutron energies such as those occurring in nuclear power plants, shielded high-energy accelerators, etc.
<b>Technical Specifications</b>	Energy range: 40 keV to 40 MeV Dose Measurement Range: 20 mrem to 25 rem (200 $\mu$ Sv to 250 mSv)	Energy range: 0.25 eV to 40 MeV Dose Measurement Range: 10 mrem to 25 rem (100 $\mu$ Sv to 250 mSv)
<b>U.S. Accreditations</b>	National Voluntary Laboratory Accreditation Program (NVLAP) accredited (NVLAP LAB CODE 100518-0) in category VIA when combined with Luxel+ or InLight	
<b>International Accreditations</b>	Health and Safety Executive (HSE) United Kingdom, External: Whole Body Neutrons Department of Energy Laboratory Accreditation Program (DOELAP) accredited Canadian Nuclear Safety Commission (CNSC) authorized for use	