TASL*IMAGE*

Radon Dosimetry System

A complete system for etching, scanning and analysing plastic nuclear detectors

TASL*IMAGE* Technical Specifications

Performance

Readout time:	30-80s per plastic or ~1 hour for a tray (49 pcs)
Lower detection limit:	5 Bq/m^3
Upper detection limit:	15 MBq/m^3
Accuracy of calculated doses:	3-6% in the range from 200-5,000 kBqh/m^3

Output

Database output:	Comma separated variable file format
Graphical output:	Bitmap and graph

Hardware

Microscope:	Custom designed microscope incorporating fittings for Nikon optics components and 3-axis motorised control.
Optics:	Nikon CFI LU Plan Epi 20x objective Nikon L-IM modular focusing unit Nikon Standard sextuple nosepiece
Camera:	JAI CV-A50
CCD:	Monochrome, interlaced, 25 fps, pixel size 8 microns square
Computer:	Windows PC with Windows 7
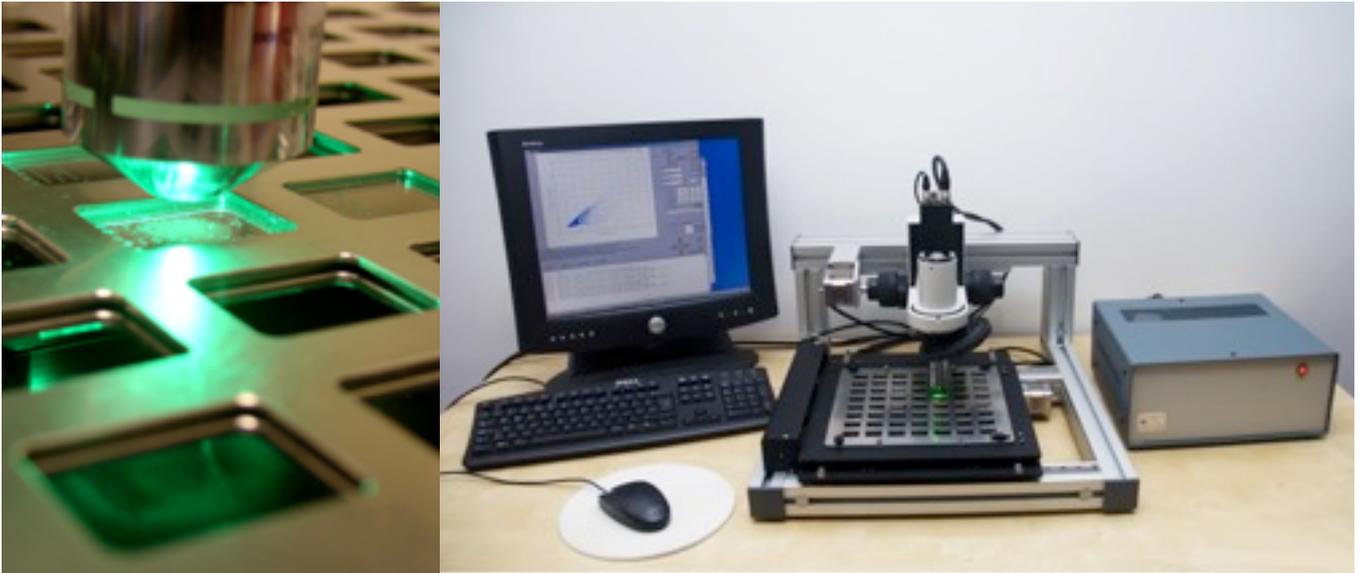
Overview

TASL*IMAGE* is a microscope based track analysis system which utilise high quality Nikon optics to achieve unprecedented discrimination between tracks and background features. The system can be run as a fully automatic readout system for dosimetry services or be used for individual plastic analyses. The scan data is automatically converted to a dose measurement and the results are displayed in a record database. This database can be exported as a csv file and imported into other programs such as Excel.

Key features

‣   Fully automatic readout of batches of detectors.

‣   Automatic correction for response fading, allowing 12 months exposures.

‣   Correction for static in the pot.

‣   Discrimination of radon and thoron.

‣   Automatic ID reading, both our own proprietary format and the "Autoscan" format.

‣   Fully automatic autofocus including live tracking of plastic surface focus.

‣   Automatic background assessment.

The TASL*IMAGE* system is unique in that it analyses and characterises each individual track to produce a dose measurement. The algorithm discriminating an etched track from a background feature, whether it is a scratch, a hair etc., does this by using a large number of parameters relating to the characteristics of a track.

The software enables the user to analyse each measurement, which in case of a spurious result can assist in identifying the source of the problem or indicate if the measurement itself was flawed. For instance, the presence of dirt on the plastic surface might throw the autofocus, resulting in a bad result and with a simple click from a drop down menu a plot can reveal if that was the case. The system is completely automatic, requiring only a button click, and will provide a dose measurement for each piece of plastic. User controlled analysis of individual plastics is also possible with a user interface providing numerous options for in depth investigations.

We can offer a complete system where the detectors are placed in a stainless steel holder for etching, dried, and transferred in the same holder for scanning. The software can be configured for any size of plastic and any style of ID code.

Our Radon Detectors

For short and long term measurements

Our radon detectors consists of a black conducting plastic casing with a sensitive TASTRAK plastic element inside.

Radon detectors and TASTRAK can be purchased for self assembly. Instructions on how to assemble them and treat them with antistatic solution will be provided. Alternatively, the detectors can also be purchased assembled and custom labels containing your logo and the detector number can be offered at a small additional price.

Performance of our complete dosimetry system

The TASLIMAGE analysis system combined with our TASTRAK plastic can be used for radon measurements ranging from as little as 7 days and up to 1 year.

From our experience with the TASLIMAGE system we have found the following uncertainties related with measurements of varying number of days and varying radon concentrations:

7 day measurements with radon concentrations in the range of 60 - 80 Bq/m^3 typically have an associated uncertainty of about 50%. Increasing the exposure time will decrease the uncertainty to about 20% with a measurement time of 30 days. For 3 months measurements at radon concentrations around the 200 Bq/m^3, the associated uncertainty is down to only a few percent, typically 4-6 %.