

TRACK - ETCH

- FOR THE EVALUATION OF THE RADON ACTIVITY IN SOIL.

□ APPLICATIONS

- Geological survey
- Uranium prospection.
- Geophysical studies :
 - earthquake,
 - volcanic eruptions.



- Passive measurement, no disturbance of the environment.
- Integration period from week up to months.
- Water tight polyethylene membrane to avoid water entrance.
- Integrated metal washer for easier localisation.

Specifications



Measurement of radon:

The radon enters a detection volume through a membrane.

The detector used by ALGADE to use the track-etch technique is Kodak LR115 film.

During exposure of the dosimeter, alpha particles penetrate the detector's sensitive layer and cause damage which is revealed after chemical development of the film.

The impacts due to alpha particles are shown by a discoloration of the sensitive surface. The diameter of the discoloured areas is between 6 and 10 micrometers.

An optical counting, by automatic image analyser, enables the number of impacts to be quantified and therefore by application of a calibration coefficient, the exposure of the film to be measured.

Radon :

Sensitivity 0.8 tracks.cm⁻² per kBq.h.m⁻³
(typically)

Range 0.1 MBq.h.m⁻³ to 30 MBq.h.m⁻³

Factors of influence

The method is not susceptible to environmental factors of temperature, pressure or humidity.

Measuring period :

Depending of the activity

Minimum 1 week

Maximum 1 year.

Maximum depth use : 1 meter.

Detector :

Solid-state nuclear track detector
type KODAK LR 115 T2-

Operating temperature :

+0°C to +40 °C.

Casing :

Casing made of plastic container.

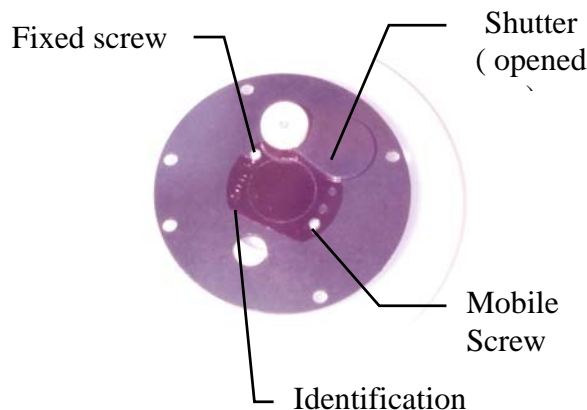
Size : diameter 90 mm
height 100 mm

Weight : 60 g.

Use :

In the Lab.

- assembly and identification of detectors
- 1-place the LR115.
- 2-place the removable screw.
- 3-close the shutter in case of non-immediate exposure.



On the field

- Open the shutter and replace the cover.
- The track-etch dosimeters are buried at a depth of about 50 cm.
- The dosimeters are placed in a regular grid pattern. Precise positioning on a plan is necessary.
- The periods of film exposure are generally between one week and one year.
- Thus account is taken of fluctuations of short duration of the volumic activity of the radon in the ground, which is known to be influenced principally by barometric pressure.
- At the end of the exposure time, the containers are unearthed. The inserted metallic block makes the container easy to find.
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In the Lab.

- Extraction of the film from the container
- Dispatching to the ALGADE laboratory, which carries out rapid processing and returns results sheet.

Exploitation of results

- The comparison of the results supplied by a network of track-etch dosimeters arranged in a regular grid and exposed for the same period of time gives information about the presence of possible mineralised areas.