



InLight dosemeter

sck:cen

Exploring
a better tomorrow

The SCK CEN InLight dosemeter

The dosemeter contains aluminium oxide detectors doped with carbon (Al₂O₃:C) as active elements. The measurement method is based on **optically stimulated luminescence (OSL)**. This means that part of the impinging ionising radiation energy will be stored by electrons in metastable energy positions in the detector. This stored energy can be released by illuminating the material with light of a specific wavelength. The energy is then released as visible light that can be measured. The amount of emitted light is directly proportional to the accumulated radiation dose.

The readout of the dosemeters is done in a dedicated automatised reading device.



Dose range

The scope of measurement of the InLight dosemeter ranges **from 50 µSv up to 10 Sv**. The dosemeter can be read out several times, as only a small and reproducible fraction of the stored energy is released during illumination.

The uncertainty on our measurements has been evaluated. Uncertainties are not reported routinely, but can be given upon request. Our uncertainties are lower than is required in the international standards.

Energy range

The dosemeter is measuring both the $H_p(10)$ depthdose as the $H_p(0.07)$ skin dose. The SCK CEN InLight dosemeter is accredited for the following energy ranges.

Radiation	Quantity	Energy Range
Photons	$H_p(10)$	16 keV – 6 MeV
	$H_p(0.07)$	16 keV – 1.25 MeV
Bèta's	$H_p(0.07)$	0.7 MeV – 2.3 MeV

The dosemeters can be used between -10 °C and 40 °C.



Composition

Dosemeter case loaded inside a transparent cover, labelled and locked by a crocodile clip

Slide with 4 detectors inside case

Slide and case

The detectors are shielded from ambient light by the surrounding case. Only in the readout device, the slide with the detectors is mechanically taken out of its case and illuminated.

The four detectors of the dosemeter all consist of carbon doped aluminum oxide but they are positioned behind four different filters included in the case.

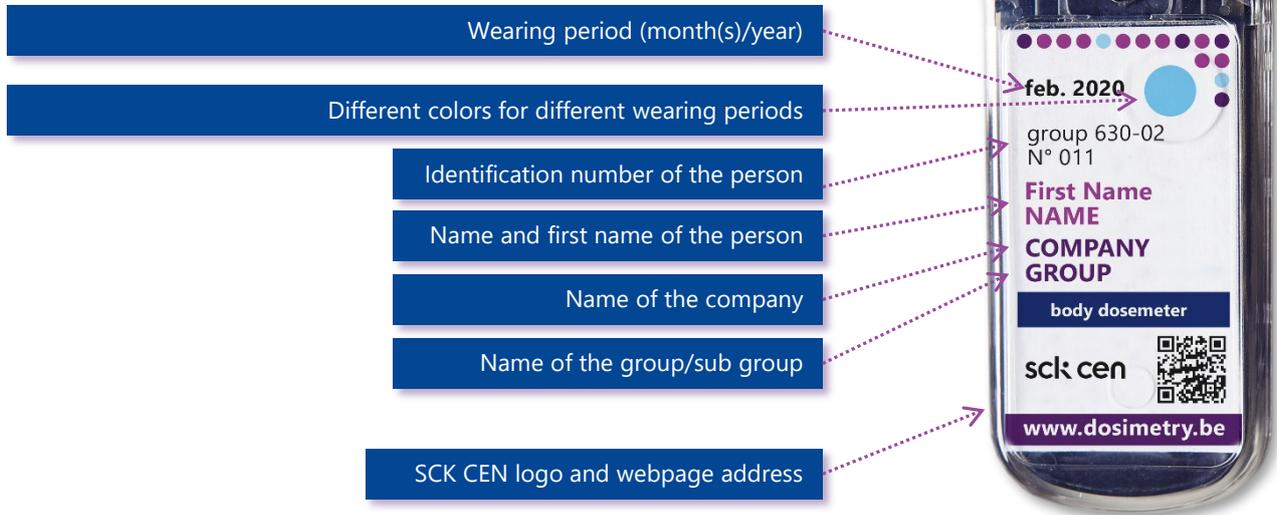
These filters are there to determine the energy of the incident radiation, such that the dosemeter responds in a tissue equivalent way to all radiation energies.

Each case has a unique identification number and an individual sensitivity correction factor that is periodically reassessed and used for evaluation of the dose.

Carrier, label and cover

The case with the slide is loaded on a carrier and placed into the transparent cover. As the cover should be dust and water-resistant and the detectors must be protected against disturbing influences, the covers are always closed by a pin.

Each dosemeter has a unique label with following information:



Clip

The standard dosemeter is closed with a pin and a crocodile clip. If desired, the crocodile clip can be replaced by a holder that allows the dosemeter to be strapped onto a lanyard.

The standard recommended position of the dosemeter is on the chest. In case a lead apron is being used, it is common practice to wear two dosemeters. The standard dosemeter is worn below the lead apron and an extra dosemeter with different color is to be worn above the lead apron.

Beside personal dosemeters we can also offer extremity dosemeters. We provide finger as well as eye lens dosemeters. Please contact us for more information.



Reporting & results

Web application

The web application is a portal for the communication between the customer (contact persons of a company) and the dosimetry service. It is secured by means of https and it is password protected. All changes should be communicated via this application.

Each customer gets a **unique login**. It allows following actions:

- Request a new dosemeter
- Request to stop providing a dosemeter from a certain date on
- Report a lost dosemeter
- Consult dose results
- Obtain dose overviews of the full company or a group or sub-group
- Obtain overviews of cumulated doses of 5 years per person
- Generate dose reports for FANC

All the results remain accessible at any time via this web application. Whenever new results are available, the contact person will receive a notification e-mail.

Dose results

The dose results can be exported in different formats or they can be printed. New results will be available at latest four weeks after the receipt of the dosimeters at the SCK CEN dosimetry lab.



For each dosimeter, **two dose results are reported**. The personal dose equivalents $H_p(10)$ and $H_p(0.07)$. Both are indicated in the unit mSv, millisievert. The first one, $H_p(10)$ or '**deep dose**' is the estimation of the effective dose, and gives an indication of the stochastic effects of ionising radiation. This needs to be compared with the legal limit of 20 mSv per year for occupationally exposed persons. The $H_p(0.07)$ or '**shallow dose**', is an indication of skin dose, and should not exceed the legal limit of 500 mSv per year.

When a **lead apron is worn**, the $H_p(10)$ results of the dosimeters above and below the lead apron are both reported and are also combined to estimate the effective dose.

Quality control and accreditation

Our personal dosimetry service is accredited according ISO 17025, and the dosimeter is conform the IEC 62387 standard. We also follow the recommendations of RP160 publication from the EC, 'Technical Recommendations for Monitoring Individuals Exposed to External Radiation'. We have received the approval as official dosimetry service by the authorities in Belgium. We undergo 3 audits in a period of 5 years by BELAC, the Belgian accreditation organisation. We maintain a system of follow up of all complaints, and hold regular customer satisfaction reviews.

All reported values are traceable to international standards. For quality control we have introduced a series of daily quality control measures and periodic calibrations of the readout devices and the dosimeters. A dummy customer allows us to follow up our overall performance. We participate to all EURADOS international intercomparison exercises and all our results have been good up to now. These results are also available on request.

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