Personal Dosimeter MPA TL-DOS GD 01

Technical Datasheet — Version: 08.11.2023

MPA NRW.
Materialprüfungsamt Nordrhein-Westfalen
Personendosis-Messstelle

TL-DOS Personal Dosimeter

- **Whole body dosimeter**
- **Photon-personal dosimeter (X-rays & gamma-radiation)**
- **Depth personal dose equivalent $H_p(10)$**

The TL-DOS personal dosimeter, MPA TL-DOS GD 01, is a whole-body dosimeter for photon radiation (X-rays and gamma radiation). It is designed to measure the personal dose of occupationally exposed persons according to § 66 (1) of the German Radiation Protection Ordinance (StrlSchV). The personal dose is determined as the depth personal dose $H_p(10)$, which is used to monitor the effective dose.

Measuring Method

■ Thermoluminescence

The detector is a thermoluminescence detector based on lithium fluoride doped with magnesium and titanium (LiF:Mg,Ti). It absorbs the radiation very similar to human tissue and stores the dose information until it is evaluated.
In the evaluation device (reader) a light signal („luminescence“) is emitted by heating („thermo“) the detector.
The strength of this signal is a measure of the stored dose information. After this heat treatment, the detector is back in its original state (regenerated) and can be used again for dose measurement.

Contact

E-Mail: bestell.dosimetrie@mpanrw.de
Phone: +49 231 4502-518
www.dosimetrie.de

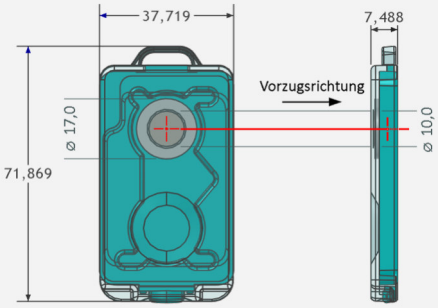
Dosimeter badge

■ Two-part dosimeter badge

The dosimeter badge consists of a two-part cassette with a transparent top shell (material: PC) and a coloured back shell (material: POM). In this cassette a detector blister is inserted which contains two thermoluminescence detectors. The dosimeter badge is ready to measure when a current detector blister is inserted in the cassette (see illustration: left side).

■ Reference point and preferred direction

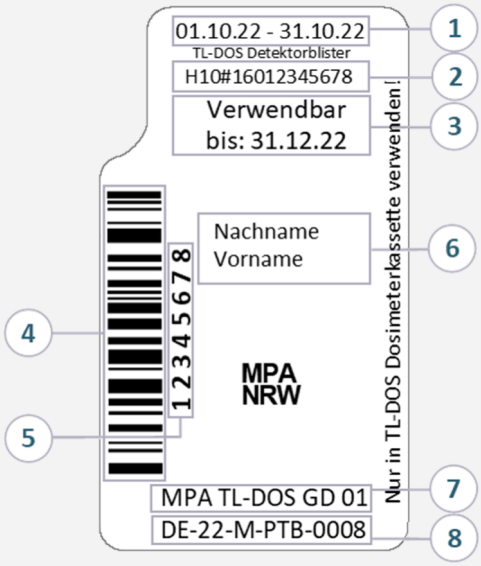
The reference point for the measurement is the centre of the upper detector (see figure left, red cross). The preferred direction for incident radiation is perpendicular to the surface of the detector blister (arrow in figure). The dimensions of the badge are given in the figure. The weight of the dosimeter badge including the carrying clip is 28 g.



■ Imprint on the detector blister

Notice:
The blister is to be used exclusively in the TL-DOS dosimeter cassette

1. Intended wearing period
2. Number of the main detector (measurand $H_p(10)$)
3. Maximum usability - if no wearing period is assigned
4. Dosimeter number (barcode)
5. Dosimeter number (digits)
6. Assigned dosimeter carrier
7. Dosimeter designation
8. Number of the type-examination certificate



Personal Dosimeter MPA TL-DOS GD 01

Technical Datasheet — Version: 08.11.2023

MPA NRW.
Materialprüfungsamt Nordrhein-Westfalen
Personendosis-Messstelle

Instructions for use

■ Blister exchange

The detector blister is replaced before each wearing period. To do this, the used detector blister is removed from the cassette and the new detector blister is inserted. The cassette can be opened for this purpose by means of a push button on the underside. The inner shape of the cassette provides for correct insertion. The carrying clip can be used to attach the cassette to clothing (e.g. breast pocket or belt).
belt. According to the Radiation Protection Ordinance (StrlSchV), a position representative of the exposure must be chosen.
As a general rule, this is the front of the torso. The back of the dosimeter must rest against the body; it is identified by the word "Körperseite" (body side).

■ Wearing period

The wearing period for passive dosimeters is generally 1 month; it may be extended up to 3 months by the competent authority.
Before use, the dosimeter may be stored for a maximum of 5 months; after 6 months at the latest, it must be returned to the dosimetry service.

■ Protection against radiation

As a passive dosimeter, it measures continuously and must be kept away from artificial radiation sources during transport and storage.

Dosimetric data

■ Dosimetric data according to type-examination

▪ **Rated ranges of use**

Photon energy and angle of incidence	20 keV bis 7000 keV ± 60°	
Dose	0,1 mSv bis 1 Sv	
Coefficient of variation of the dose response of a random sample	0,1 mSv ≤ $H_p(10)$ < 1,1 mSv	7 %
	1,1 mSv ≤ $H_p(10)$	2 %
Ambient temperature and relative humidity	-10°C to +40°C 10% to 90% (not-condensing)	
Maximum measurement period	6 months	
Reusability	up to 5 Sv, above: Reusability test	

▪ **Influence of other types of radiation**

Influence of beta radiation

The influence of beta radiation on the indicated value of the TL-DOS dosimeter is negligible.

Influence of neutron radiation

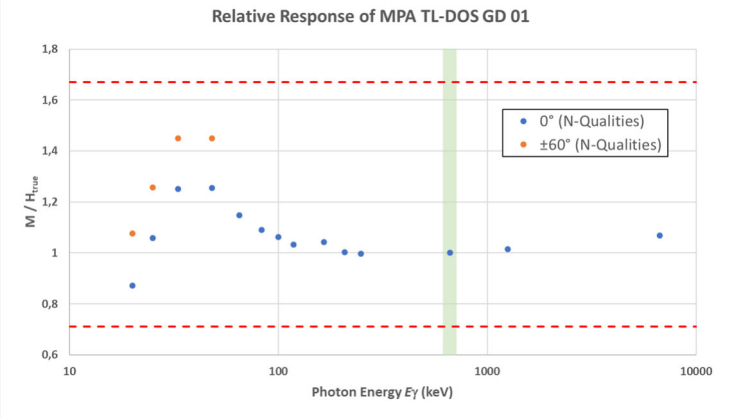
Source	*Neutron Dose $H_p(10)$ in mSv*	*Photon indicated value $H_p(10)$ in mSv*
^{252}Cf	6,0 ± 0,2	1,5 ± 0,1
$^{252}Cf(D_2O\text{-mod.}) + Cd$	6,0 ± 0,7	10,3 ± 0,4

Indicated value after background subtraction, double standard deviation given.

The dosimeter is not suitable for use in neutron radiation fields. The MPA-Albedo Dosimeter is available for this purpose.

■ Dose response

The relative dose response indicates the measurement deviation due to energy or angle of the incident photon radiation compared to the reference condition (662 keV / Cs-137 and 0°).



Quality Management

The dosimetry service is accredited according to DIN EN ISO/IEC 17025:2018 [D-PL-11142-01-00].

It participates in national and international intercomparison measurements.