Translation from Bulgarian

MINISTRY OF HEALTH
NATIONAL CENTRE OF PUBLIC HEALTH AND ANALYSIS
15, Acad. Ivan Geshov Blvd.
1431 Sofia
Bulgaria
Tel.: +359 2 80 56 444
+359 2 951 53 02
Fax: +359 2 954 12 11

PROTOCOL

OL № 260

DATE: 25.09.2020

PRINCIPAL: Medical Education Technology Ltd through Ivan Paunov ET "Agrolini - Ivan Paunov".

TEST OBJECT: Air flow UV-lamp for indoor air decontamination with emitting light tube of the type OSRAM T8 UVC, 15 W.

TEST PURPOSE: Measurement and assessment of exposure to UV radiation from an air flow UV-lamp for indoor air decontamination.

ASSESSED PARAMETERS:
Power density (energy flow) of UV radiation, E, W/m^2
Allowable downtime, t, s.

REGULATORY DOCUMENTS:
Ordinance № 5/11.06.2010 of the Ministry of Labour and Social Policy and the Ministry of Health on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation), (SG, issue 49/2010).

BSS EN 14255-1:2005 Measurements and assessment of personal exposures to incoherent optical radiation - Part 1: Ultraviolet radiation emitted by artificial sources in the workplace

Recommended guide for good practice in the application of Directive 2006/25/EC. (Artificial optical radiation). European Commission. Directorate-General for Employment, Social Affairs and Inclusion, Department B.3, ISBN 978-92-79-19803-8 doi:10.2767/29825, European Union, 2011.

USED EQUIPMENT:

Photometer/Radiometer IL 1400A of International Light, USA with detectors:
- SEL 240, with diffuser type W # 6642, spectral range λ = 190 - 290 nm.

MEASUREMENT METHOD

The measurements of the source of UV radiation were performed by a non-selective method for the spectral range - UVC (corresponding to the limit values of index 1 / Ordinance № 5/2010).

When performing the measurements, the requirements of the following documents were observed:

BSS EN 14255-1:2005 Measurements and assessment of personal exposures to incoherent optical radiation - Part 1: Ultraviolet radiation emitted by artificial sources in the workplace.

Recommended guide for good practice in the application of Directive 2006/25/EC. (Artificial optical radiation). European Commission. Directorate-General for Employment, Social Affairs and Inclusion, Department B.3, ISBN 978-92-79-19803-8 doi:10.2767/29825, European Union, 2011.

The tested source does not emit significant levels of visible and infrared radiation. In this sense, radiation in the UV range of the optical spectrum may pose a health risk, the most significant being UVC radiation. For these reasons, exposure limit value of 1, Table 1.1., Ordinance № 5/2010, applies.

Despite the fact that Ordinance №5/2010 is for the working environment, the limit values represent the conditions under which it is considered that almost all members of the population can be exposed repeatedly without harmful effects on health. However, they do not apply to people with photosensitivity or exposed to photosensitizing substances, which makes them more susceptible to damage from optical radiation.

ADDITIONAL CONDITIONS FOR MEASUREMENT AND ASSESSMENT

Measurements of UV radiation from an air flow UV-lamp for indoor air decontamination were performed along the emitting light tube around the lamp body and at both ends, on the fan side and on the light tube side, at different distances from the grids of the pipe. The measurements in order to assess the possible exposure of the users and to prepare recommendations for use were performed in two positions of the sensor of the measuring equipment - parallel to the grid surface and at an angle parallel to the lamellae of the grid.

From the measured values the allowable downtimes at different distances from the source were calculated. These times are only indicative, as they cannot be required to be observed by the population. The results record the minimum calculated allowable downtimes calculated from index 1 (worst case) of Ordinance № 5/2010. The allowable downtime refers to unprotected eyes and skin of workers and the population (ICNIRP 2004).

MEASUREMENT RESULTS:
The measurement results are presented in Table № 1.

Table № 1

№	Measurement point	Radiation power density, mW/cm^2	Allowable downtime, t
1	2	3	4
1.	**On the fan side**		
1.1.	To the surface of the grid	0.001	50 min
1.2.	At 5 cm	0.001	50 min
1.3.	At 10 cm	Not registered	-
2.	**On the light tube side**		
2.1	**Parallel to the grid surface**		
2.1.1.	To the grid surface	1.320	2 s
2.1.2.	At 5 cm	0.436	6 s
2.1.3.	At 10 cm	0.058	51 s
2.1.4.	At 15 cm	0.032	1 min 31 s
2.1.5.	At 20 cm	0.011	4 min 32 s
2.1.6.	At 25 cm	0.005	10 min
2.1.7.	At 30 cm	0.003	16 min 40 s
2.1.8.	At 35 cm	0.002	25 min
2.1.9.	At 70 cm	0.001	50 min
2.1.10.	At 80 cm	0.001	50 min
2.1.11.	Over 100 cm	Not registered	-
2.2	**Parallel to the lamellae of the grid**		
	On the left side (behind the lamellae)		
2.2.1.	At 5 cm	0.018	6 s
2.2.2.	At 10 cm	0.002	25 min
2.2.3.	At 15 cm	0.001	50 min
2.2.4.	At 20 cm	Not registered	-
	On the right side (opposite the lamellae)		
2.2.5.	At 5 cm	0.054	55 s

2.2.6.	At 10 cm	0.041	1 min 13 s
2.2.7.	At 15 cm	0.062*	48 s
2.2.8.	At 20 cm	0.012	4 min 9 s
2.2.9.	At 25 cm	0.006	8 min 20 s
2.2.10.	At 30 cm	0.003	16 min 40 s
2.2.11.	At 35 cm	0.001	50 min
2.2.12.	At 70 cm	Not registered	-

* Due to the geometry of the measuring setting

CONCLUSION:

1. The measured values of the power density of UV radiation emitted by a wireless charger with a UV sterilizing lamp exceed the daily limit value for an 8-hour day, according to the requirements of Ordinance № 5/2010 at distances up to 100 cm from the openings of the product.

Staying with unprotected eyes and skin when the lamp is switched on against the grids of the product, at its level, can pose a risk to the health of consumers.

2. We cannot comment on how long and with what number of sources indoor air disinfection is achieved, as this information should be provided by the manufacturer or determined by microbiological tests.

The product can be used for disinfection of indoor air, when people stay inside, and to protect the health of the population/consumers, the following recommendations should be observed

RECOMMENDATIONS:

1. When installing the device, it must be located out of the field of view of the occupants of the room, at a distance of at least 100 cm from the opening of the device.

2. The device must be installed in such a way as to avoid radiation falling on reflective surfaces.

HEAD OF PHYSICAL FACTORS DEPARTMENT

(Assoc. Prof. M. Ivanova, MD)
/signature, illegible/

MEASUREMENT AND ASSESSMENT PERFORMED BY:

1. (Assoc. Prof. M. Ivanova, MD)
/signature, illegible/

2. (R. Petrova)
/signature, illegible/

NATIONAL CENTRE OF
PUBLIC HEALTH AND ANALYSIS
Ref. № 2124/30.09.2020

I, the undersigned Dimitrina Georgieva Alexiadis, hereby certify that this is a true and accurate translation from Bulgarian to English language done by me of the attached document.
The translation consists of 4 (four) pages.
Translator: Dimitrina Georgieva Alexiadis