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KL/I 1/1 Lodz, 22-08-2016

Certificate of Analysis No K/313/01/2016

Subject of analysis: Bactericidal lamp of direct action series NBV 2 x 36 IP 65 equipped with OSRAM light tubes

Customer: Ultra-Viol sp.j. Pietras, Purgał, Wójcik
ul. Stępowizna 34
95-100 Zgierz

The sample for testing was delivered by the Customer: 12-07-2016
The tests began: 13-07-2016
The tests finished: 22-08-2016

Type of analysis	Method	Results
Microbiological parameters		
Research of bactericidal effectiveness against:	Own Methodology Instruction I-85	The reduction of microorganisms
- *Staphylococcus aureus* ATCC25923		$R_{1\ min}$ = 99,3%
		$R_{4\ min}$ = 100%
- *Escherichia coli* ATCC 25922		$R_{1\ min}$ = 99,5%
		$R_{4\ min}$ = 100%
- *Salmonella* Typhimurium ATCC14023		$R_{1\ min}$ = 99,8%
		$R_{4\ min}$ = 100%
- *Listeria monocytogenes* ATCC13932		$R_{1\ min}$ = 93,4%
		$R_{4\ min}$ = 100%
- *Saccharòmyces cerevisiae* (yeast) ATCC 9763		$R_{1\ min}$ = 98%
		$R_{4\ min}$ = 100%
- *Aspergillus restrictus* (molds) ATCC 42693		$R_{1\ min}$ = 58,7%
		$R_{4\ min}$ = 98,3%
		$R_{15\ min}$ = 100%

Authorized:
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Assessment of antibacterial efficacy of Bactericidal lamp of direct action series NBV 2 x 36 IP 65 equipped with OSRAM light tubes

The aim and scope of the research

The aim of the study was to determine the antibacterial efficacy of bactericidal lamp of direct action series NBV 2 x 36 IP 65 equipped with OSRAM light tubes (Research report K/313/01/2016), against microorganisms: *Staphylococcus aureus* ATCC25923, *Escherichia coli* ATCC 25922, *Salmonella* Typhimurium ATCC14023, *Listeria monocytogenes* ATCC13932, *Saccharomyces cerevisiae* (yeast) ATCC 9763, *Aspergillus restrictus* (mold) ATCC 42693.

Test procedure

The research was conducted in accordance with its own methodology developed at the Laboratory No. I-86, point. 6.4 "Checking the effectiveness of the UV lamps".

A suspension of the test strain (density adjusted to that of a 1 McFarland standard) was prepared, followed up with a series of decimal dilutions. Aliquots of 1 ml were spread onto 2 Petri dishes of 140 mm diameter with a suitable agar (TSA or TSYEA) to obtain an increase from 900 to 1100 cfu (colony forming units). One control Petri dish (without UV exposure) was placed in an incubator at a suitable temperature for the microorganism (25°C, 30°C, 37°C) and incubated for a specified time, from 48 hours to 5 days. A second test Petri dish was placed open on the table and exposed to UV rays at a distance of 1 meter, respectively: 1 minute, 4 minutes, 15 minutes. The Petri dish was then sealed and incubated in the suitable for the microorganism temperature (25°C, 30°C, 37°C) for a specified time (from 48 hours to 5 days). After an incubation time the grown colonies on the control Petri dish and the test Petri dish (UV exposed) were counted. The study was performed in triplicate for each microorganism, and then calculated the percentage reduction in the number of microorganisms according to the formula 1.

(1) R = 100-(b x 100/k)

were:

R – reduction in the number of microorganisms

b – average number of colonies on the test plates after UV exposure

k – average number of colonies on the control plates (without UV exposure)