EVALUATION OF THE BIOCIDAL ACTIVITY OF THE PURACLENZ P3000 AIR PURIFIER AGAINST *STAPHYLOCOCCUS AUREUS* ATCC 6538 ACCORDING TO THE EN 17272 STANDARD

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This report 3300.PUR.21.P2 Sa.v2 supersedes 3300.PUR.21.P2 Sa.

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INDEX OF REVISIONS

Each revision of the test report cancels/supersedes the previous one.
In order to limit the risks of errors and misuse of outdated document any cancelled reports and copies must be destroyed.

Amendment history		
Report N°	Amended paragraph(s)	Purpose of the amendment
3300.PUR.21.P2 Sa	-	First version
3300.PUR.21.P2 Sa.v2	V.	Addition of the mean reduction in percentage
	VI.	“on surfaces”

CONTENT

I. DESCRIPTION OF THE STUDY:

Title:	EVALUATION OF THE BIOCIDAL ACTIVITY OF THE PURACLENZ P3000 AIR PURIFIER AGAINST *STAPHYLOCOCCUS AUREUS* ACCORDING TO THE NF EN 17272 STANDARD
Internal reference:	Study N° : 3300.PUR.21.P2
Sponsor:	PURACLENZ P.O Box 733 Old Greenwich, CT 06870 USA Contact : Gonzague LEROUX
Test period:	From 25/02/2022 to 30/03/2022
Study manager:	Mélanie BAROU
Test laboratory :	Laboratoire EUROFINS BIOTECH – GERMANDE 505 rue Louis Berton Bâtiment 2 13290 Aix en Provence

II. OBJECTIVE OF THE STUDY:

Evaluate, according to the test conditions described in the EN 17272 standard[(1)], the ability of the PURACLENZ P3000 air purifier to reduce, in presence of specific interfering substances (clean conditions), in 4 hours, 8 hours and 12 hours, the number of viable cells of *Staphylococcus aureus*.

III. TESTED PROCESS:

Name:.....	P3000
Manufacturer:.....	PURACLENZ
Technology*:.....	Photocatalytic oxidation (PCO)

*Data provided by the customer, do not engage the laboratory responsibility.

IV. METHOD:

a) Tested strain:

Staphylococcus aureus ATCC 6538

The conditions of preservation and control of the microbial strains used for the determination of the bactericidal activity are those described in the European standard NF EN 12353[(2)] (internal protocol: T-DM-S-WO37879).

b) Interfering substances:

Bovine albumine:.....	3 g
Tryptone-salt:.....	q.S.p. 100ml
Final bovine albumine concentration:.....	0.3 g/L
Internal reference:.....	10078322

Sterilized by membrane filtration.

c) Neutralizing solution:

Composition of the neutralizing solution:

Tween 80:.....	10% (v /v)
Lecithin:.....	2%
Sodium thiosulfate:.....	2%
L-Histidin:.....	2%
Saponin:.....	1%
Tryptone soya broth:.....	q.s.p. 100ml

Steam sterilized (121°C, 21 minutes).

d) Contamination solution

For bacteria, contamination solutions were prepared in sterile deionized water according to the NF EN 17272 standard and interfering substance were added to reach a concentration of 0.3g/l of BSA (clean conditions described in IV. b).

e) Growth and counting conditions:

Trypticase Soya Agar. Steam sterilized (121°C, 21 minutes).
Incubation at 37°C ± 1°C during 48 hours.

f) Carriers:

Stainless steel disk according to the paragraph 5.2.3.2 of the standard.

g) Conditions of use of the device:

The method used for the test is described in the standard EN 17272 (Fig. 1). Stainless steel discs are inoculated with a bacterial suspension in presence of an interfering substance (clean conditions). After drying, stainless steel discs are exposed to the tested process (3 test discs are exposed per tested contact time).

After exposure to the tested process for 4, 8 and 12 hours, discs fall into the neutralizing solution where microorganisms are recovered by agitation. Viable microorganisms are incubated on the growth medium for 48 hours at 37°C. After incubation, viable bacteria are enumerated and results are expressed in number of CFU (colony-forming unit) per disc.

At the same time, two positive control discs per tested contact time, inoculated in the same way as the test discs, are not exposed to the tested process. At the end of each tested contact time, bacteria are recovered in the neutralizing solution by agitation and viable microorganisms are enumerated after incubation.

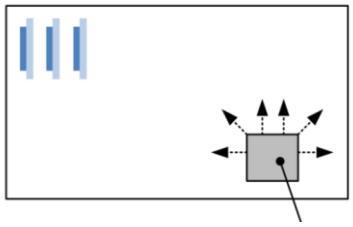

Figure 1. Arrangement of the equipment during the test. The carriers are placed at the opposite side of the tested process according to the specification of the NF EN 17272 standard.

Volume of the room:	34.5m^3
Temperature at the beginning of the tests:	20°C ± 2°C
Relative humidity at the beginning of the tests:	Between 50% and 75%
Negatively charged ions concentration* during tests:	≥ 500 ions/cm^3

*real-time ion monitoring system provided by the customer, do not engage the responsibility of the laboratory

V. RESULTS:

Table 1: Results. Evaluation of the biocidal activity of PURACLENZ P3000 air purifier according to EN 17272 against *Staphylococcus aureus* ATCC 6538. T: number of microorganisms on control discs not exposed to the device. N1: counting of test suspension for dilution/inclusion – N2: counting of test suspension by filtration. n1: search of inhibitor effect in the agar medium. – n2: Search of inhibitor effect in membrane. n'1: number of surviving test organism in 100 ml of recovery liquid – n'2: number of colonies obtained directly by inclusion of the carrier. n'1+n'2: number of microorganisms on the test carrier. Experimental conditions are validated if n1/N1 > 0.5, n2/N2 > 0.5 and n3/N1 > 0.5 meaning that neither growing medium nor filtering membrane have a growth inhibition effect.

Contact time	Microbial test suspension (N) (Nb. CFU/ml)	Preliminary tests			Positive control (T) (Nb. CFU/carrier)	Tests (3 replicates)		
		n_1/N_1	n_2/N_2	n_3/N_1		n'1+n'2 (Nb. CFU/carrier)	Mean Log_{10} reduction	Mean reduction (%)
4 hours	4.5×10^8	1.1	1.1	1.0	5.2×10^6	1.2×10^6	0.6	77%
8 hours					5.2×10^6	2.6×10^5	1.3	95%
12 hours					4.1×10^6	4.7×10^5	1.0	88%

VI. CONCLUSIONS:

In the test conditions described, the P3000 process (PURACLENZ) induces a reduction of the number of viable cells of *Staphylococcus aureus* ATCC 6538 of 1.3 log_{10} on surfaces after a contact time of 8 hours (i.e a reduction of 95% of the initial microbial load inoculated on test supports).

VII. REFERENCES:

1- NF EN 17272: April 2020. Chemical disinfectants and antiseptics – Method of airborne room disinfection by automated process – Determination of bactericidal, mycobactericidal, sporicidal, fungicidal, yeasticidal, virucidal and phagocidal activities.

2- NF EN 12353:2013. Chemical disinfectants and antiseptics – Preservation of test organisms used for the determination of bactericidal (including Legionella), mycobactericidal, sporicidal, fungicidal and virucidal (including bacteriophages activity).

VIII. STATEMENT GOOD LABORATORY PRACTICE:

The study was conducted according to NF EN ISO/IEC 17025 (2017) General requirements for the competence of testing and calibration laboratories. Applicable Standard Operating Procedures and Good Laboratory Practice were followed in this study.

The original records of this report, the notebooks, protocol, and final study report are stored in the archives of Eurofins Biotech-Germande «3300.PUR.21.P2».

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19/04/2022