EVALUATION OF THE BIOCIDAL ACTIVITY OF THE DEVICE « DEFENDER » ACCORDING TO A TEST METHOD BASED ON THE EN 17272:2020 STANDARD AGAINST *STAPHYLOCOCCUS AUREUS*

(20°C ± 2°C – CLEAN CONDITIONS)

Report written by: Mélanie BAROU

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VERSION HISTORY

Each revision of the report cancels and supersedes the previous one.
In order to limit the risk of misuse of outdated documents, any cancelled reports and copies should be destroyed.

Version history		
Report N°	Amended paragraphs	Purpose of the modification
3509.GTS.22	-	Initial version

TABLE OF CONTENTS

I. STUDY DESCRIPTION:

Title:	Evaluation of the biocidal activity of the device « DEFENDER » according to a test method based on the NF EN 17272:2020 standard (20°c ± 2°C – Clean conditions)
Internal number:	Study N°: 3509.GTS.22
Sponsor:	GPS MONACO GROUP 5 rue Gabian Le Triton - 5ème étage 98000 Monaco Contact: Nicolas Blasin
Study period:	13/10/2022 - 17/10/2022
Study manager:	Mélanie BAROU
Technicians:	Ebru SELVITOP / Bastien RECUSATI
Test laboratory:	Laboratoire EUROFINS BIOTECH – GERMANDE 505 rue Louis Berton Bâtiment 2 13290 Aix-en-Provence

II. OBJECTIVE:

Evaluate, according to a test method based on the NF EN 17272 standard, the ability of the device « DEFENDER » to reduce, in presence of interfering substances (clean conditions), in 12h and 24h, of at least 10^5 the number of viable cells of *Staphylococcus aureus* inoculated on stainless steel discs.

III. TESTED DEVICE:

Name: ..... DEFENDER (figure n°1)
Batch number* : ..... Not provided
Manufacturer : ..... GPS Monaco Group
Technology* : ..... Photocatalysis

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

Figure n°1: DEFENDER ►

IV. METHOD:

a) Tested strain

Staphylococcus aureus CIP 4.83

The conditions of conservation and control of the bacterial strain used for the determination of the bactericidal activity are those described in the NF EN 12353 standard (internal protocol: T-DM-S-W037879).

b) Interfering substance

Bovine albumin:	0.03g
Tryptone salt:	q.S.p. 100ml
Bovine albumin concentration:	0.3g/l
Internal reference:	149AA00811

Sterilized by membrane filtration.

c) Neutralizing solution

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

Sterilized by autoclave (121°C, 21 minutes).

Internal references: E610.1.1/E610.1.2/E610.1.3/E610.1.4

d) Counting medium

Trypticase Soya Agar

Sterilized by autoclave (121°C, 21 minutes).

Internal references: E611.1.1/E611.1.2/E611.1.3/E611.1.4

e) Supports

Stainless steel discs, in accordance with requirements of the paragraph 5.2.3.2 of the standard.

f) Conditions of use of the device

The test method used is the one described in the NF EN 17272 standard (Fig. 2), except for the distance between the discs and the tested device which was reduced to 1 meter for these tests.

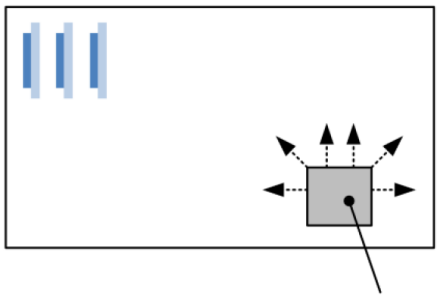

Figure 2. Equipment set up for the tests. The supports are placed opposite to the device according to the requirements of the standard.

Volume of the test chamber :.....	34.5 m^3
Temperature at the beginning of the tests :	20°C ± 2°C
Incubation temperature :	37°C ± 1°C
Relative humidity at the beginning of the tests :	50%-75%

V. RESULTS

Contact times	Microbial test suspension (N) (Nb. CFU/ml)	Preliminary tests			Positive control (T) (Nb. CFU/support)	Assays		
		n_1/N_1	n_2/N_2	n_3/N_1		n'1+n'2	Mean reduction (Log10)	Red %
12 hours	1.7×10^8	3.5	1.5	1.2	$T_{12h}=9.2\times10^6$	1.9×10^5	$R_{moy} = 1.7$	**97.9%**
24 hours					$T_{24h}=5.2\times10^6$	1.6×10^5	$R_{moy} = 1.5$	**96.9%**

Table 1 : Results. Evaluation of the biocidal activity of the device « DEFENDER » according to the NF EN 17272 standard against *Staphylococcus aureus* CIP 4.83. T : number of microorganisms on the control disc. N1 : enumeration of the test suspension by dilution/inclusion- N2 : enumeration of the test suspension by filtration. n1 : inhibitory effect in the agar medium – n2 : inhibitory effect of the membranes. n'1 : number of surviving microorganisms in 100 ml of the neutralizing solution – n'2: number of colonies obtained by direct inclusion of the disc. n'1+n'2 : number of microorganisms per disc. d1 : disc N°1/ d2 : disc N°2/ d3 : disc N°3. Experimental conditions are validated if n1/N1 > 0.5, n2/N2 > 0.5 et n3/N1 > 0.5, if neither the counting agar, the membranes, nor the supports have any inhibiting effects. CFU: colony forming unit.

VI. CONCLUSIONS

Considering the experimental conditions described, the device « DEFENDER » is able to reduce of 1.7 $\log_{10}$ (i.e. 97.9% of the initial inoculum) the number of viable cells of *Staphylococcus aureus* CIP 4.83 inoculated on stainless steel discs, after a contact time of 12 hours in presence of interfering substances (clean conditions).

VII. REFERENCES

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

VIII. GOOD LABORATORY PRACTICES

This 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 practices were followed in this study.

The original records of this report, the notebooks and protocol are stored in the archives of Eurofins Biotech Germande “3509.GTS.22”.

Melanie BAROU
Le 04/11/2022