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Test Report n°162272-001

Esteemed:
SANITY SYSTEM ITALIASRL
Via Delle Industrie 13/C
35010 Limena (PD)

Report date*: 2016-12-19*
Acceptance number:*162272*

Description:	**"SANY-WATER PLUS"** – ozone generator for sanitizing environments, surfaces, water
Sample arrival date:	2016-11-11
Test start date:	2016-11-22
Test end date:	2016-12-12

Effectiveness check of microbial abatement by ozone sanitization produced by a special instrument

Purpose

The objective of this study is to verify the functionality of an ozonator device in determining microbial abatement on the environment:

Water (in 2L carafe)

Test campion	

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Verification capacity of microbial abatement on water

Media test	Drinking water from sterilized aqueduct
Quantity of water tested	2L
Program tested	Sanitized water 2L (carafe)
Program time	5 minutes
Microorganisms used for infection, Temperature and time of incubation	*Escherichia coli* ATCC 25922 – (37±1)°C per 48h *Staphylococcus aureus* ATCC 25923 – (37±1)°C per 48h *Candida albicans* ATCC 10231 – (30±1)°C per 72h
Quantity inoculum	0.4 ml
Test parameters	% reduction Ozono concentration
Test start date	2016-11-22
Test end date	2016-12-07
Ozonation process	

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Table D.1: verification of the preparation and validation of the recovery of suspensions of microorganisms after the test period (CFU/ml)

	Suspension at the time t0		**Suspension from control solution at the end of the tests**		
Test microrganism	Initial test suspension (N)	Log(N)	Recovery (C)	Log(N_{X1})	Validation of the recovery method log(N) - log(C) $\leq$ 0.5
Escherichia coli	3.0 x 10^4	4.5	3.0 x 10^4	4.5	0
Staphylococcus aureus	2.9 x 10^4	4.5	2.9 x 10^4	4.5	0
Candida albicans	2.1 x 10^4	4.3	2.0 x 10^4	4.3	0

Table D.2: Colony count results in CFU/ml of contaminated water and for the tested ozonation time.

Time of ozonation		0 minutes	5 minutes
Test microrganism	Unit of measure	**Count colonies**	
Escherichia coli	CFU/ml	3.0 x 10^4	< 1
Staphylococcus aureus	CFU/ml	2.9 x 10^4	4
Candida albicans	CFU/ml	2.1 x 10^4	3

Table D.3: Results in percentage reductions in counts based on the initial contamination value of contaminated water for the tested ozonation time.

Time of ozonation		5 minutes
Test microrganism	Unit of measure	**percentage reduction %** $\frac{time_x .... - t_0}{t_0} \times 100$
Escherichia coli	%	> -99.9967
Staphylococcus aureus	%	-99.9862
Candida albicans	%	-99.9857

Table D.4: Results of concentration of ozone in the water in different test times.

Time of ozonation				2.5 minutes	5 minutes	30 minutes
Parameter	Method	Unit of measure	Start date End date	Concentration		
Ozone	APAT CNR-IRSA 4020 Man 29 2003	mg/l	2016-12-12 2016-12-12	0.10	0.18	0.16

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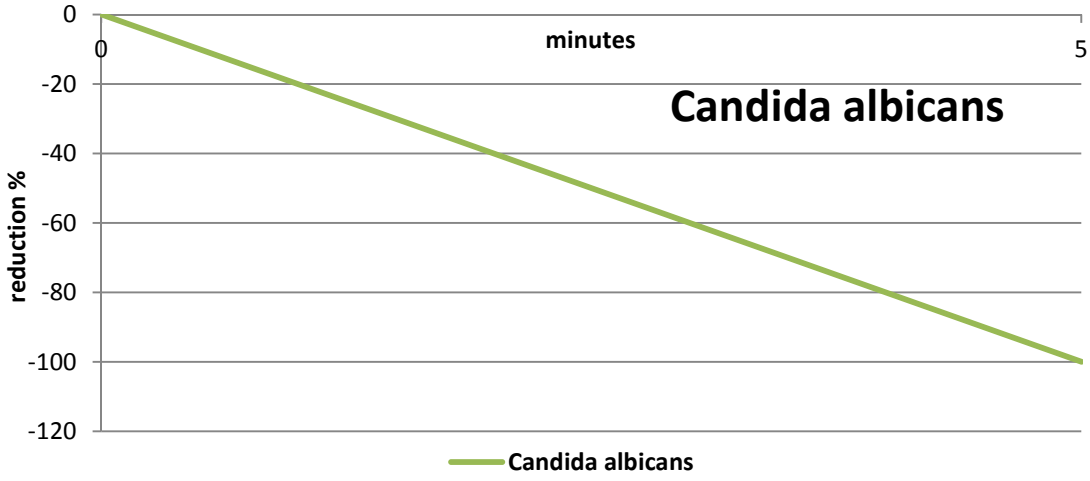

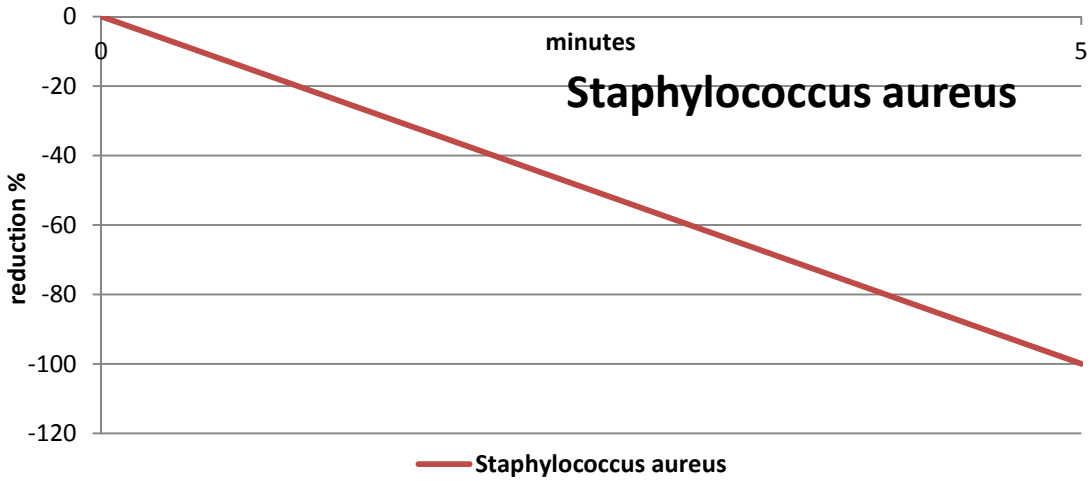

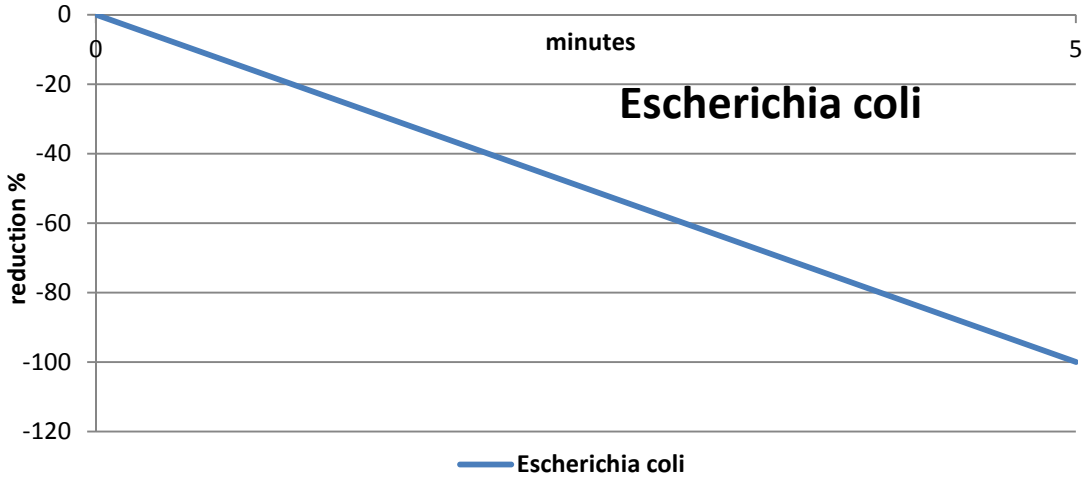

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Conclusions

As can be seen from the results, found in Table D.2 and D3, the preset program that produces an ozone flux for 5 minutes for 2 liter bottles /carafes, entails significant microbial reductions for all three microbial classes tested, on beat gram positive, negative and fungus (yeast).

Following these tests it has been shown that for all three microorganisms excellent percentages are achieved;
equal to

- greater than 99.9967% for the negative gram beat Escherichia coli
- 99.9862% for the positive gram beat *Staphylococcus aureus*
- 99.9857 for fungus (yeast) *Candida albicans*

It can therefore be concluded that for the microbial sanitization of water (for the program tested for this function), the apparatus is able, within the established time, to produce an ozone concentration such as to give an excellent antimicrobial effects.

Furthermore, it has been verified that the water maintains an ozone concentration equal to that detected at the end of the ozonation process (0.18 mg /L) even after half an hour from the end of the same, with a concentration of 0.16 mg /L.

Lab chief
Dr. Giorgio Berto
Test Report digitally signed
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