

INTERVENTION REPORT

HOSPITAL HYGIEN CONTROLS

AIR SANITISATION AND PURIFICATION EQUIPMENTS TRIALS

ADMINISTRATIVE DETAILS

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SOCIETE AIR HYGIA TECHNOLOGIES
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Dates

Sampling : 18-19/07/2006

Réception :

Registration : 18/07/2006

Analysis start date : 18/07/2006

Sampling address : Fleming Clinic, 2 rue A. Fleming 37000 Tours - France

Samples taken from : F. Chouen with the
presence of Luc Louail and Gilles Turco
Opérateur(s) : F. Chouen

Type of Product :
Origin :

Tests dates

Tests and samplings were done on the 18th and 19th July 2006 within the Fleming Clinic premises located at 2 rue A. Fleming à Tours (37) - France.

Objective

Testing the efficacy of air sanitisation (NQ 500) and purification (NQ Clarifier) devices by measuring the biological airborne contamination and particles within a hospital bedroom before, meanwhile and after air treatment.

Methods

MEASURE OF BIOLOGICAL AIRBONE CONTAMINATION

Samplings are made in an unoccupied space upon the impaction on agar method with an air sampler "Air IDEAL[®] Biomérieux". Agars used are TCS agars (Trypto-casein soya) and MCA agars (Malt Chloramphénicol Agar). The air samplings taken are, respectively, of 1m³ and 250L (air sampler capacity is : 100 l/min, which means that air sampling requires, respectively, 10 minutes and 2 minutes 30 seconds)

MEASURE OF THE NUMBER OF PARTICLES SUSPENED IN THE AIR – PARTICLE COUNTING

Counts are made in an unoccupied room with a particle counter APC Plus Biotest. They are made during the day within ambient air. Duration of each count is 3 minutes. The parameter measured is the number of particles per litre of air (converted in the number of particles per m³ – p/m³). The APC Plus particle counter offers 4 channels that allow to count simultaneously particle sizes of 0,1 µm, 0,3 µm, 1,0 µm, 5,0 µm.

Reference frames

Micro-biological monitoring of health care facilities, air, water and surfaces – DGS/DHOS, CTIN, 2002 (France).

Technical guide "Application of the APC Plus in hospitals", Biotest.

Result 1

Device Identification: **Air sanitisation system NQ 500.**

Room treated: hospital room N° 412 (area : 16 m², volume : 40 m³)

Sampling date : 18th July 2006

Biological airborne contamination measure

N° agar	Sampling reference	Location of sampling	Sampling period	Air volume taken (litres)	Type of agar	Type of spore	Résultat CFU*
1	060719-715	4 th floor, bedroom 412	Before purification	1000	TCS	Total aerobe	148
2	060719-716	4 th floor, bedroom 412	Before purification	1000	MCA	Fungi	0
3	060719-717	4 th floor, bedroom 412	Before purification	250	TCS	Total aerobe	39
4	060719-718	4 th floor, bedroom 412	Before purification	250	MCA	Fungi	0
5	060719-719	4 th floor, bedroom 412	After purification	1000	TCS	Total aerobe	44
6	060719-720	4 th floor, bedroom 412	After purification	1000	MCA	Fungi	0
7	060719-721	4 th floor, bedroom 412	After purification	250	TCS	Total aerobe	8
8	060719-722	4 th floor, bedroom 412	After purification	250	MCA	Fungi	0

TCS agar: enumeration of total aerobe flora
MCA agar: enumeration of fungis
* CFU : Colony forming units

Particule counting

Treatment duration: 1H22min

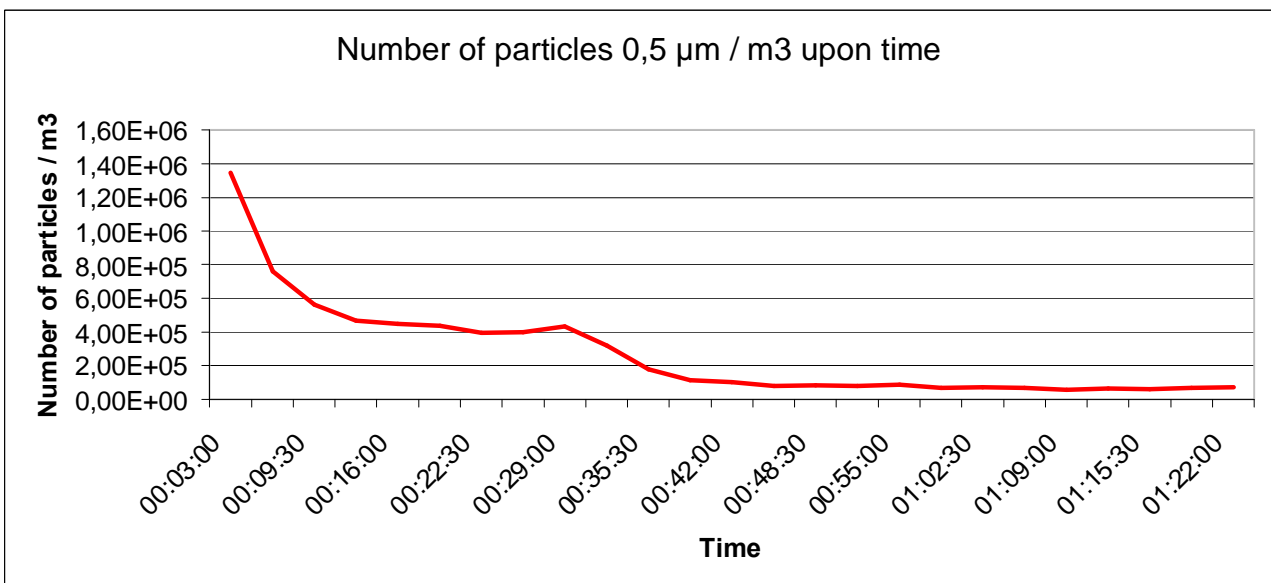
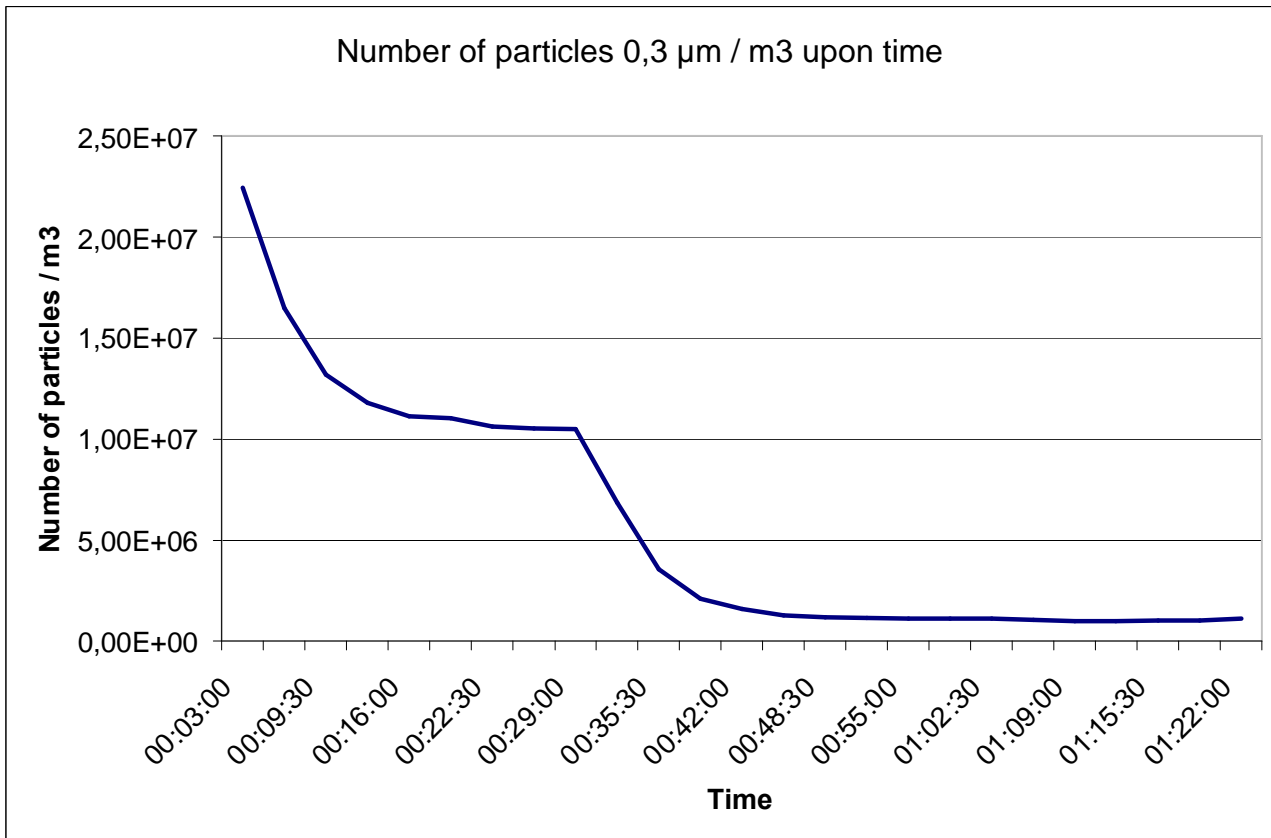
Counting duration: 3 minutes

Duration between each count : 15 seconds

	Particles 0,3 µm		Particles 0,5 µm		Particles 1,0 µm		Particles 5,0 µm	
	number / m ³	Class*	number / m ³	Class*	number / m ³	Class*	number / m ³	Class*
Before trt	22 447 000	/	1 348 000	ISO 8	239 000	ISO 7	14 000	ISO 8
After trt	1 116 000	/	71 000	ISO 7	3 000	ISO 6	0	ISO 5

*Class determined upon the norm 14644-1 (see table appendix 1)

NQ 500 – Hospital bedroom N° 412



Result 2

Device Identification: **Air purification system NQ Clarifier.**

Room treated: hospital room N° 412 (area: 16 m², volume: 40 m³)

Sampling date: 19th July 2006

Biological airborne contamination measure

N° agar	Sampling reference	Location of sampling	Sampling period	Air volume taken (litres)	Type of agar	Type of flora	Résultat CFU*
17	060719-731	4 th floor, bedroom 412	Before purification	1000	TCS	Total aerobe	124
18	060719-732	4 th floor, bedroom 412	Before purification	1000	MCA	Fungi	5
19	060719-7313	4 th floor, bedroom 412	Before purification	250	TCS	Total aerobe	26
20	060719-734	4 th floor, bedroom 412	Before purification	250	MCA	Fingi	2
21	060719-735	4 th floor, bedroom 412	After purification	1000	TCS	Total aerobe	19
22	060719-736	4 th floor, bedroom 412	After purification	1000	MCA	Fungi	0
23	060719-737	4 th floor, bedroom 412	After purification	250	TCS	Total aerobe	10
24	060719-738	4 th floor, bedroom 412	After purification	250	MCA	Fungi	0

TCS agar: enumeration of total aerobe flora
MCA agar: enumeration of fungus
* CFU : Colony forming units

Particule counting

Treatment duration: 1H02min

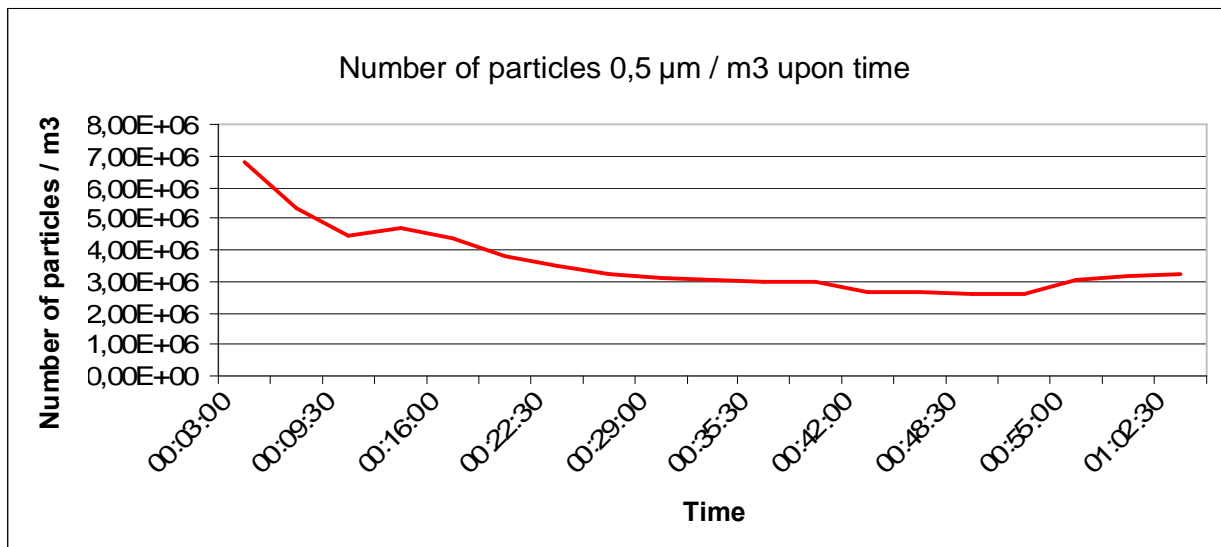
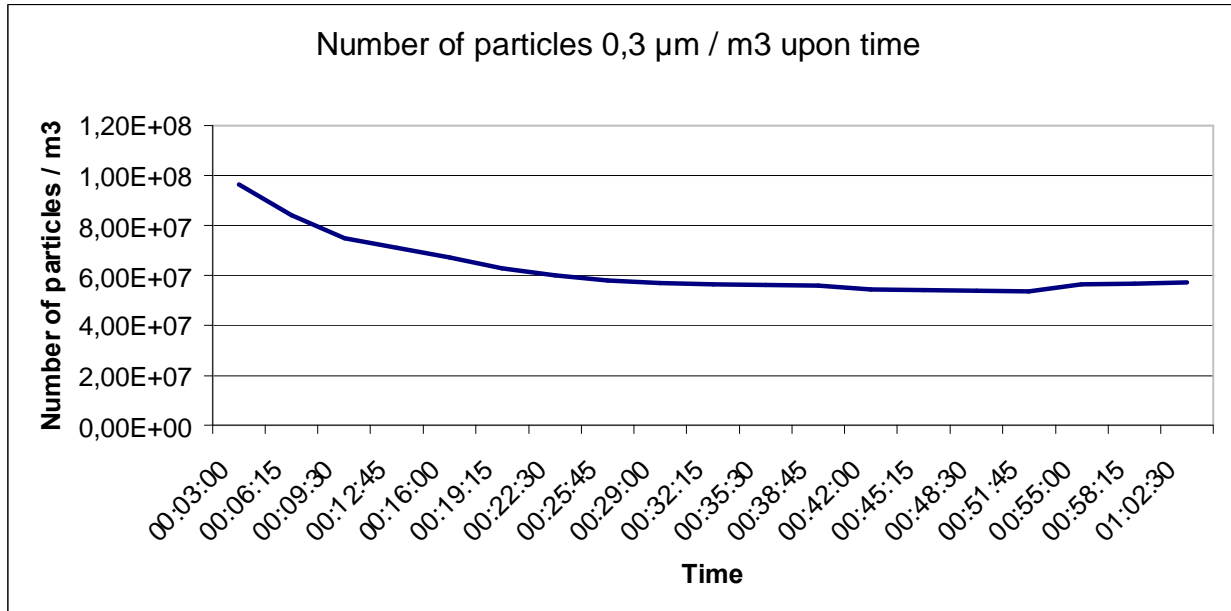
Counting duration: 3 minutes

Duration between each count : 15 seconds

	Particles 0,3 µm		Particles 0,5 µm		Particles 1,0 µm		Particles 5,0 µm	
	number / m ³	Class*	number / m ³	Class*	number / m ³	Class*	number / m ³	Class*
Before trt	96 404 000	/	6 805 000	ISO 7	285 000	ISO 7	6 000	/
After trt	57 319 000	/	3 236 000	ISO 7	102 000	ISO 7	3 000	/

*Class determined upon the norm 14644-1 (see table appendix 1)

NQ Clarifier – Hospital bedroom N° 412



Discussion

Result 1 – NQ 500 – Hospital Patient room N° 412

After 1H22 of treatment, bacteriologic analyses show evidence of a significant reduction (70%). No conclusion could be made for the fungi spore due to the fact that no fungi were detected when the samples were taken.

The particle count also shows evidence of an important reduction of the number of particles (0,3 and 0,5 µm) per cubic meter.

- For particles of 0,3 µm, the removal rate reaches 95% after only 01H22 of treatment. Particles concentration are reduced from 22 447 000 p/m³ to 1 116 000 p/m³.
- For particles of 0,5 µm the efficacy of the NQ 500 reaches 94,7 %. Particles concentration are reduced from 1 348 000 p/m³ to 71 000 p/m³.

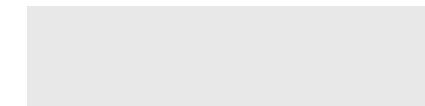
Result 2 – NQ Clarifier – Hospital Patient room N° 412

After 1H02 of treatment, bacteriologic analyses shows evidence of a reduction of 84.6% of the total aerobe spore, and give undetectable levels of fungi spore by the biological airborne contamination measure device.

The particle count also shows evidence of an important reduction of particles (0.3 and 0,5 µm) per cubic meter.

- For particles of 0.3 µm, the removal rate reaches 40,5 % after only 01H02 of treatment. Particle concentrations are reduced from 96 404 000 p/m³ to 57 319 000 p/m³.
- For particles of 0.5 µm the efficacy of the NQ Clarifier reaches 52,4 %. Particle concentrations are reduced from de 6 805 000 p/m³ to 3 236 000 p/m³.

Tours, 24th August 2006



Patrice Laudat, microbiologist

Appendix 1

Classification upon the norm ISO 14644-1

Maximum acceptable particle concentrations (particles / m³ of air) of sizes superior or equal to the one indicated*.

ISO (N)	0,1 µm*	0,2 µm*	0,3 µm*	0,5 µm*	1,0 µm*	5,0 µm*
ISO 1	10	2	/	/	/	/
ISO 2	100	24	10	4	/	/
ISO 3	1 000	237	102	35	8	/
ISO 4	10 000	2 370	1 020	352	83	/
ISO 5	100 000	23 700	10 200	3 520	832	29
ISO 6	1 000 000	237 000	102 000	35 200	8 320	293
ISO 7	/	/	/	352 000	83 200	2 930
ISO 8	/	/	/	3 520 000	832 000	29 300
ISO 9	/	/	/	35 200 000	8 320 000	293 000