REPORT
BIOZONE tests

Use of Biozone

Tests reports :

- **Quality of life in an old people's home**

EHPAD Du Bourg Joly in Saint Mathurin sur Loire (France)

- **Quality of life in a surgery private hospital**
- **Decontamination in a private surgery hospital**

Val d'Or surgery private hospital in Saint Cloud (France)

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1st survey: old people's home in Saint Mathurin sur Loire (Maine et Loire, France)

1) Material placement chart

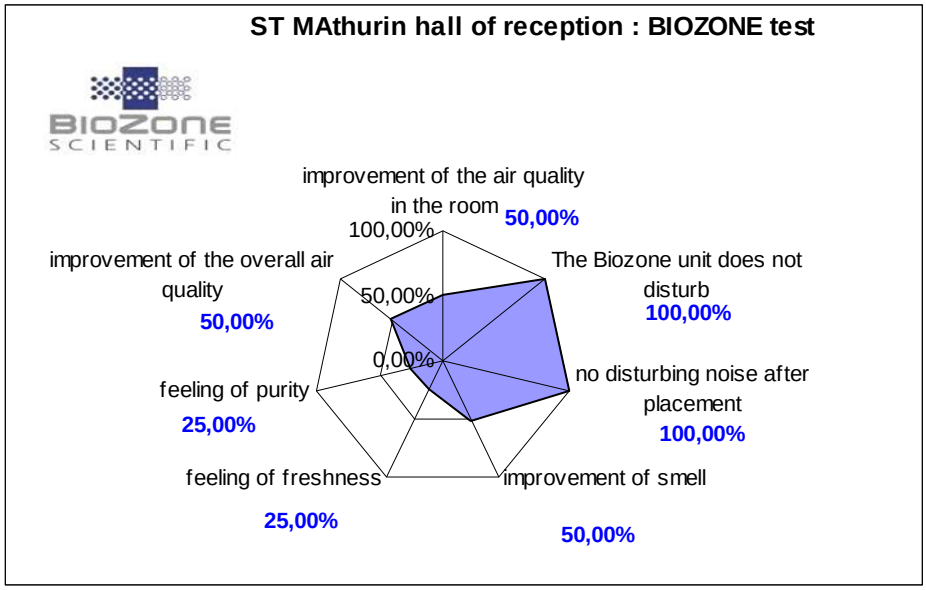
	place	dimension	Air renewal rate	Type of disturbance	Type of test
1	**Laundry room**	**2,8x5,6x2,6**	28m^3/h	Odour	Aircare 30
2	**Vegetable storage room**	**8 m^3**	No	Odour	Aircare 10
3	**Vegetable processing room**	**1x1,6x2,8**	No	Odour contamination with human presence	Aircare 20
4	**Corridor RDC**	**2,5x15x2,2**	No	Odour	2x Biozone 45
5	**Patient room n°1**	**50 m^3**	28m^3/h	Odour contamination with human presence	Biozone 45
6	**Patient room n°127**	**50 m^3**	28m^3/h	Odour contamination with human presence	Biozone 45
8	**Patients' departure room**	**50 m^3**	28m^3/h	Final contamination	Powerzone PZ2
9	**Hall of reception**	**15x5x2,5**	Open room	Odour	2x Biozone 90

2) Protocol

The Biozone units were placed in agreement with the technical staff on the first floor of the old people's home.
No units were placed on the second floor to perform a comparison.
After the Biozone unit was allowed to run for one week, a training course about the Biozone units' use was scheduled. Audits were conducted after this course.

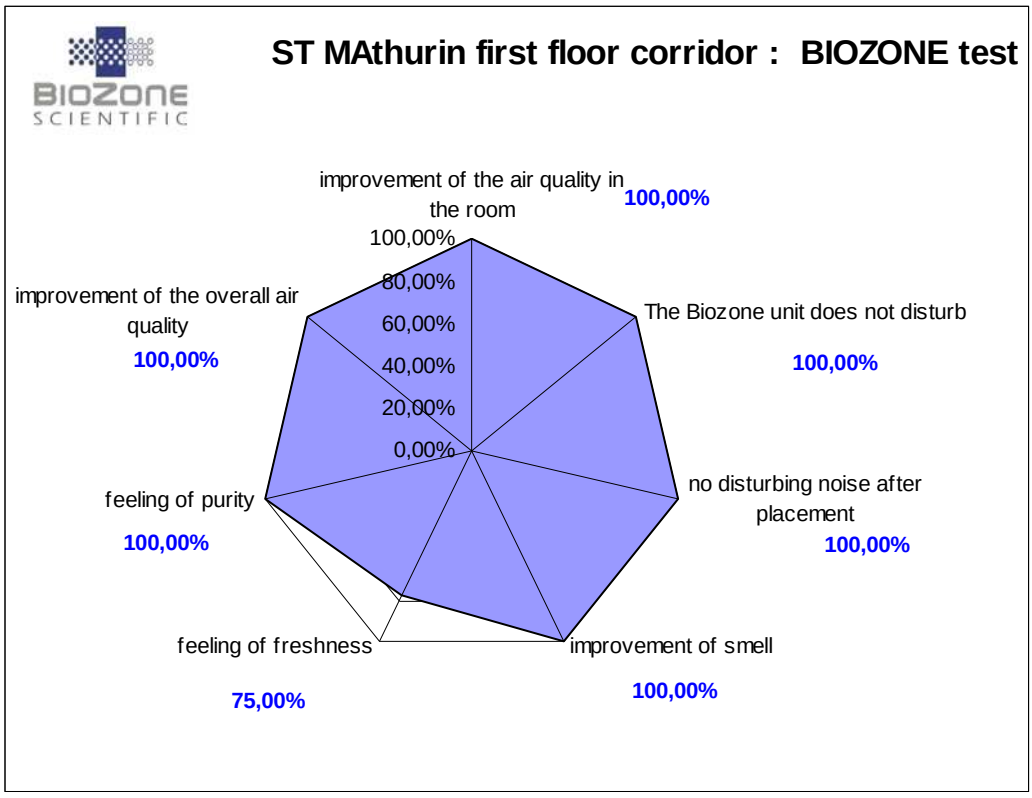
3) Results

3-1) reception hall



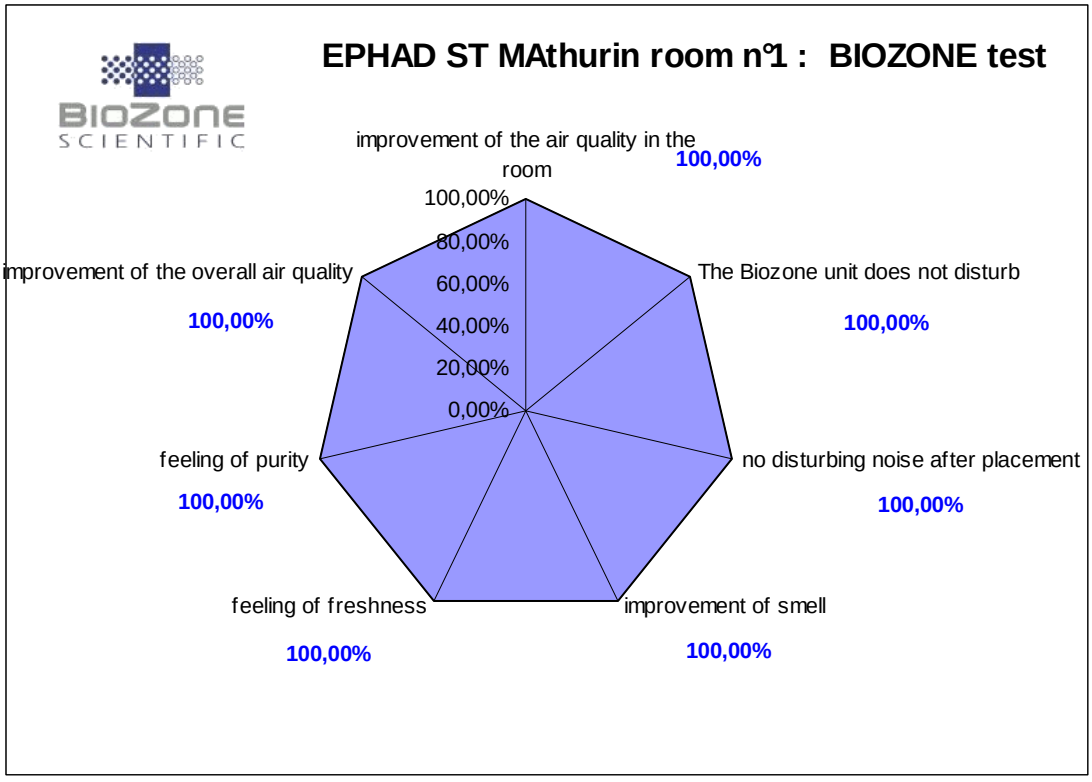
Conclusion:
Among people who were interviewed:
25% did not notice any changes
25% found the reception hall "less stale"
50% found an improvement of the air quality.

3-2) first floor corridor



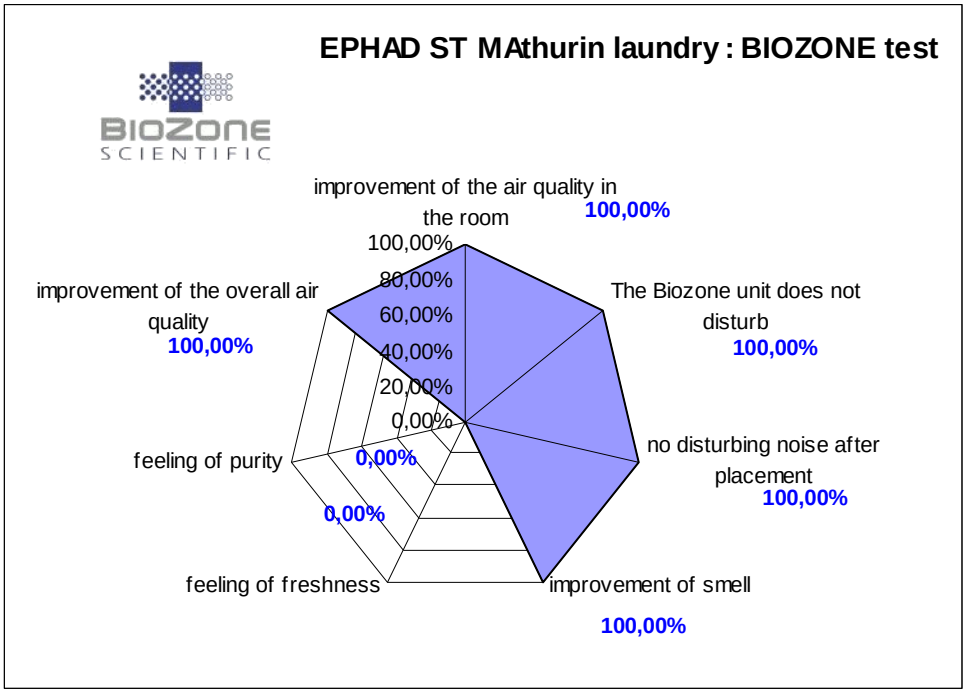
Comments:
« No more air fresheners or deodorizers are necessary ».
« In case of high air pollution, the smell disappears within one hour. »
« No more sprays are used. ».
« When a door to a patient's room is opened, the room can be deodorized. »

3-3) Patient's room number one



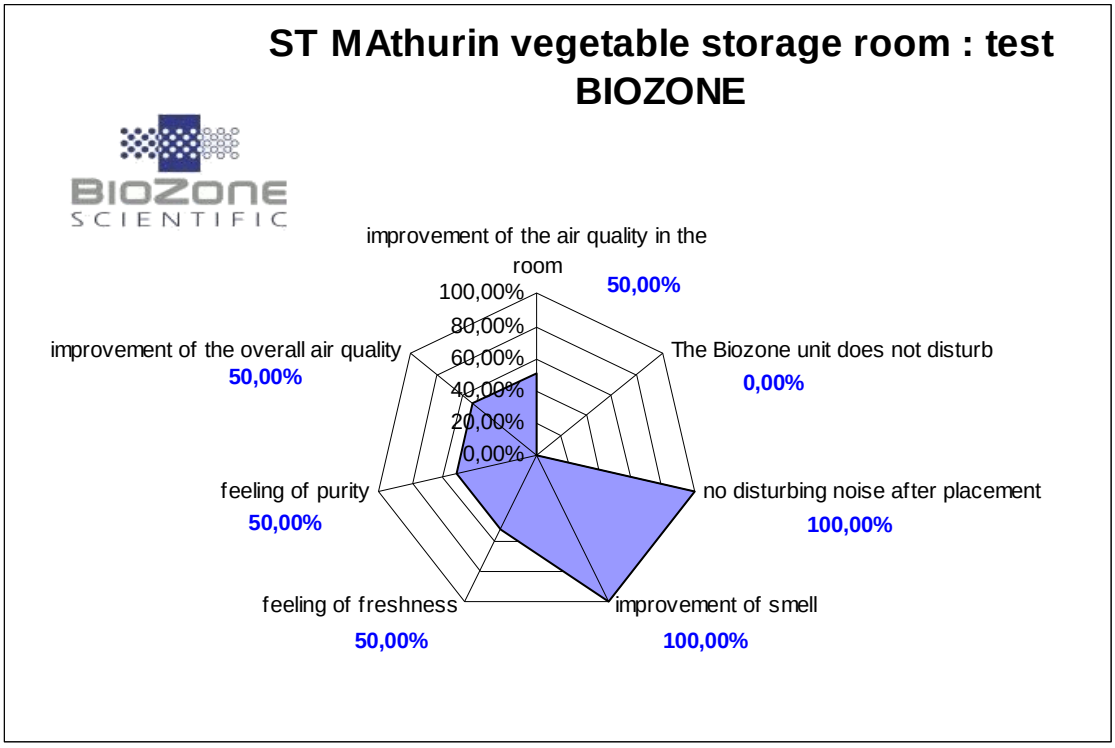
Comments:
« It's very efficient, it absorbs body odours, eliminates mugginess and feeling of heat. »
« The patient is calmer, she stops mumbling and is no longer anxious. »
« When you enter the room, it smells better, and there may be less dust. »
« Beforehand, the patient was always worried. A survey will be conducted about the positive effect on her behaviour. »

3-4) Laundry room



Comments:
« It feels like there is less dust »
“It doesn’t smell of dirty linen any more.”

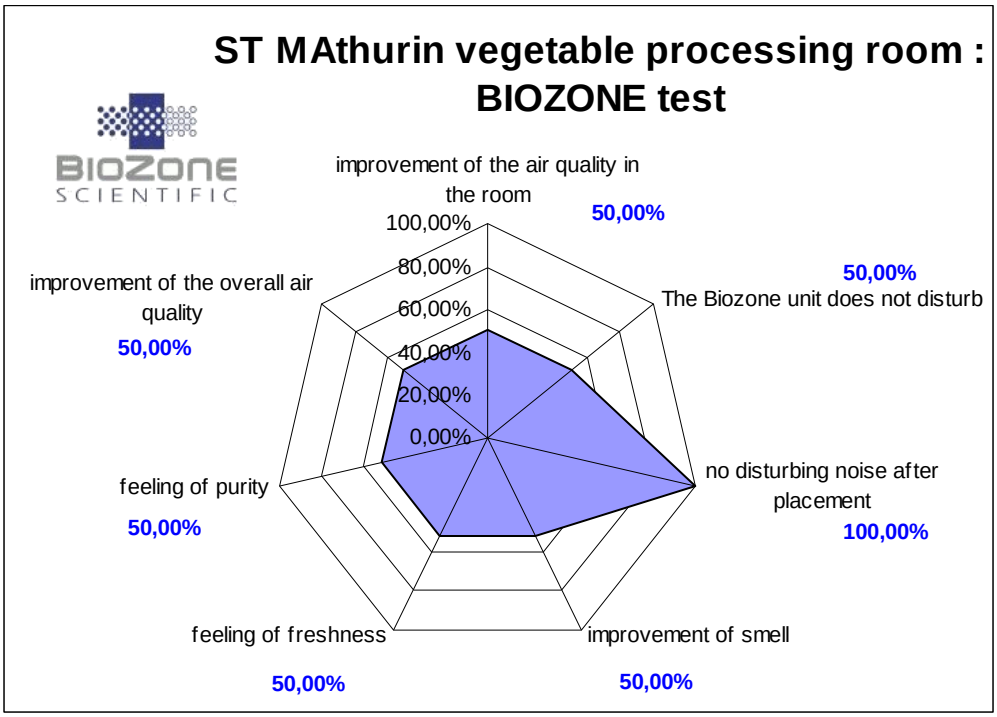
3-5) Vegetable storage room



Comments:

AIRCARE 10 – small room
« It smells better »

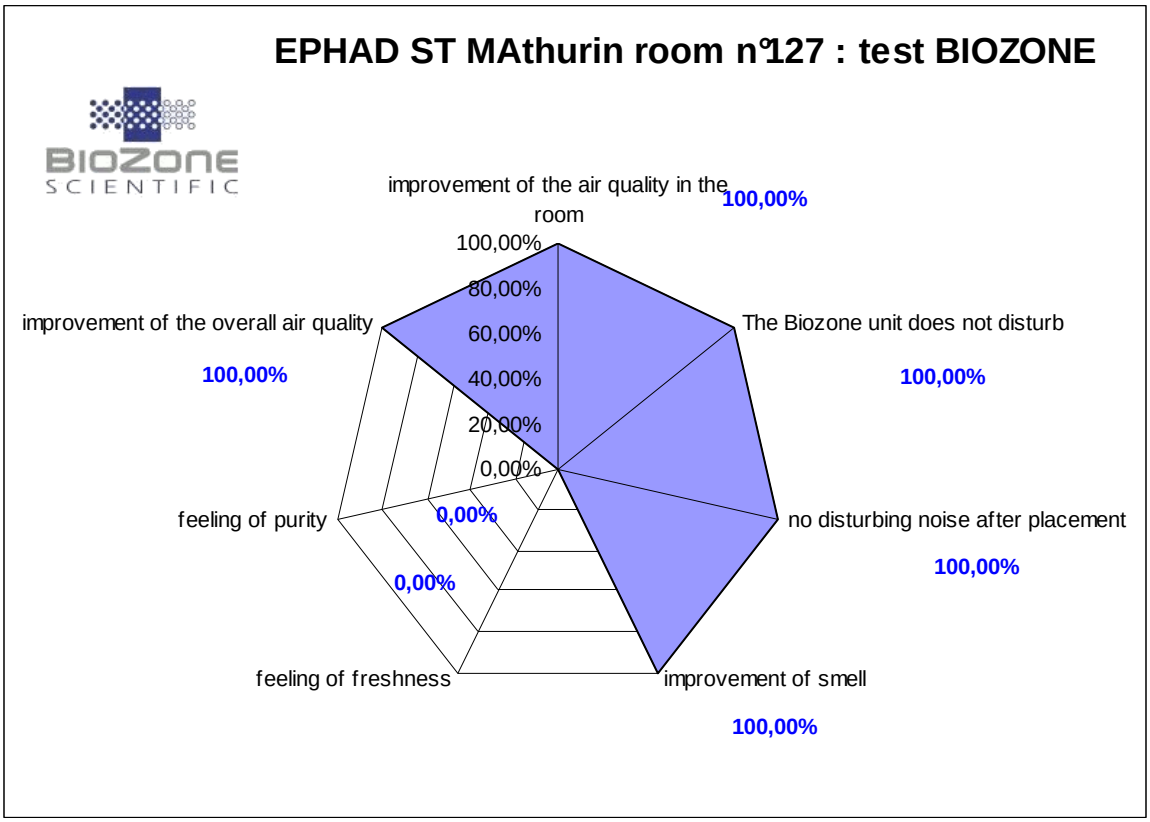
3-6) Vegetable processing room



Comments:

For one interviewed person, the smell is too strong.
« It mustn't be too powerful a unit, but now there aren't any more bad smells. »

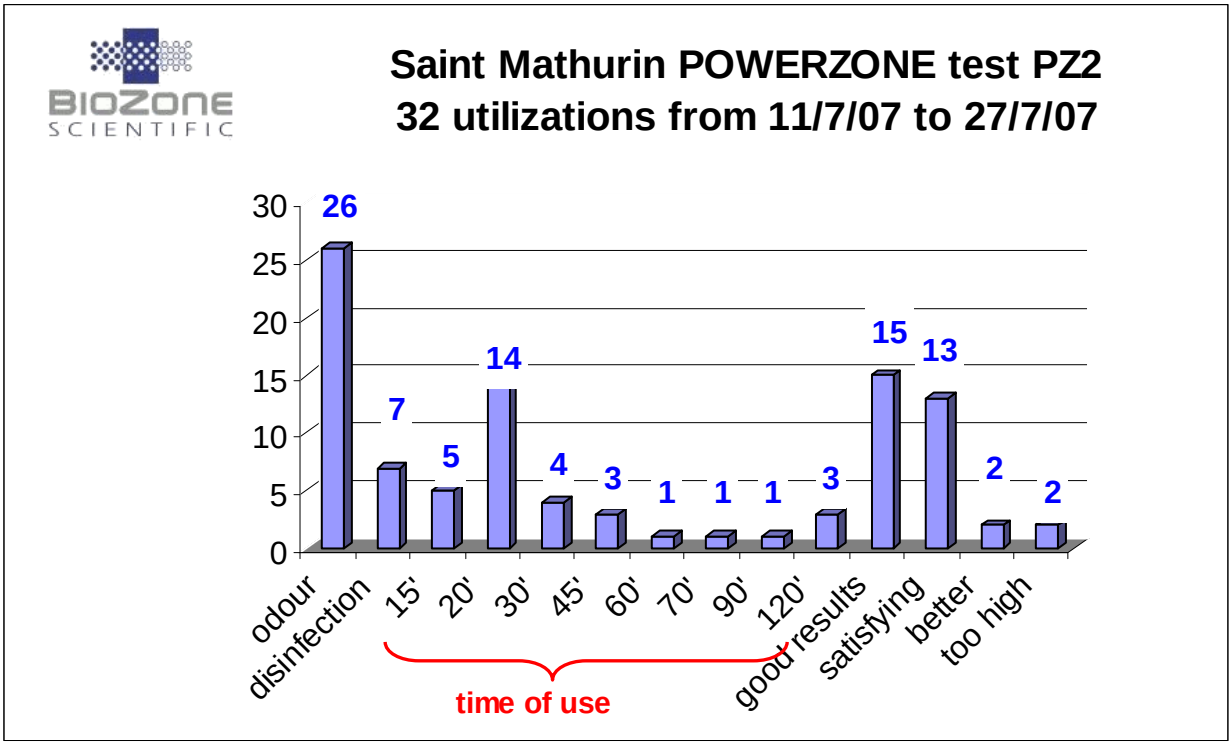
3-7) patient's room number 127



Comments:

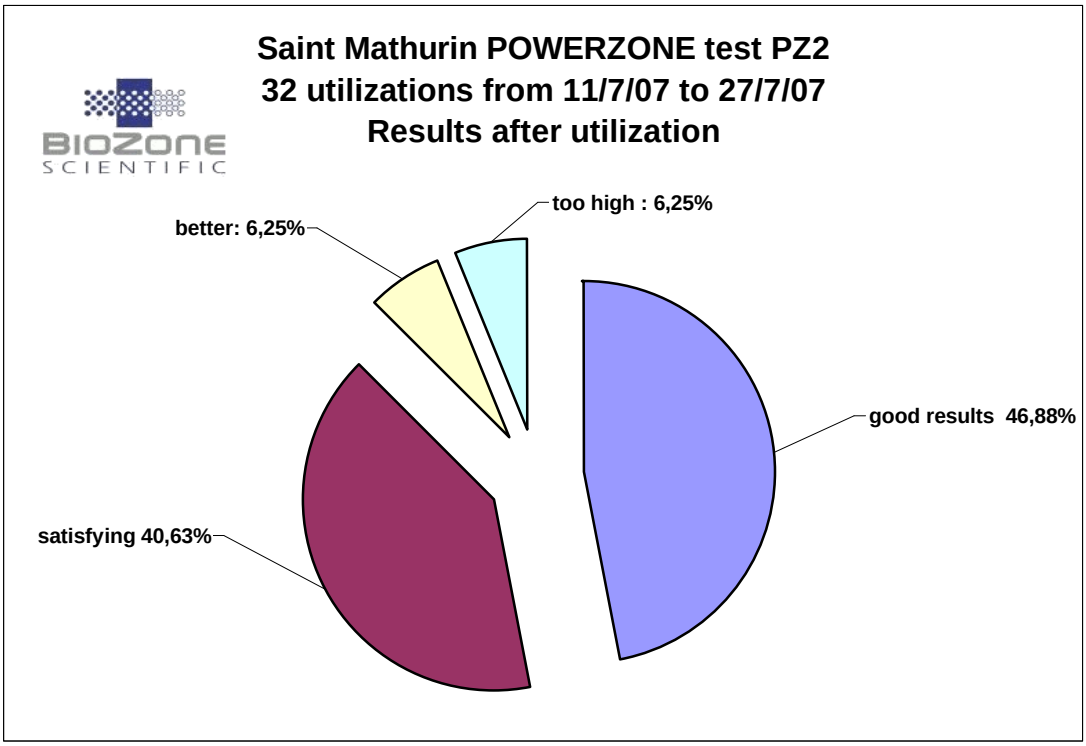
« There is no more feeling of moisture and confinement. »
« The resident is much less fidgeting. She is much more receptive. She is in a positive state »
A survey will be conducted to find out if the biozone unit has positive effects on the behaviour of the resident who suffers from Alzheimer syndrom.

3-8) Departure room



Conclusion:

The unit was utilized 32 times over a period of 16 days..
The users adapted the time of use to the intensity of smell pollution..
7 people used the **POWERZONE 2;**



Conclusion:

The results match what can be expected of the device for over 87% of the interviewed people.

On the first floor, the smell doesn't come back thanks to the Biozone units.

On the second floor, the bad smell comes back within 48 hours, or 24 hours in case of high pollution.

4°CONCLUSION

- The real efficiency of the units placed in the corridor was shown by the tests. We had to improve the system by placing a third Biozone unit at the end of the corridor and to replace the BZ45 by BZ90. Because of a strong smell pollution, BZ90 units had to run at high speed for the length of the evening care and needed to be turned down to medium or low for the rest of the day.

- The Biozone units placed in the hall of reception were of the right size since there presence was forgotten and people got used to the lack of smell.

- The conclusion in the laundry room is twofold: first there wasn't any more smell and there was much less dust in the room.

- As for the vegetable storage room, a survey on a longer time scale will enable us to show if vegetables can be kept longer.

- **The difference between the first floor where the Biozone units were placed and the second floor where no units were placed was amazing : no smells were perceptible on the former whereas odours could still be smelt, mixed with the air fresheners used by the staff. The staff of the first floor has removed air sprays from their trolleys.**

- Then it seems that the behaviour of the pensionners changed a great deal, but for this type of conclusion, tests will have to be conducted over a period of six months.

- The staff has taken to using the Powerzone on an everyday basis and has adapted its time of use to the disturbances. This unit has become indispensable to treat smells in the home.

2nd survey : Val d'Or surgery private hospital in Saint Cloud (France)

1) Material placement chart

	place	dimension	Air renewal rate	Type of disturbance	Type Biozone
1	**digestive endoscopy ward**	**4,10x2x2,6**	door and window opened permanently	APA Use during the disinfection of the endoscope	Aircare 20
2	**digestive endoscopy ward n°1**	**4,3x3,3x2,9**	862 m^3/h	odour contamination with human presence	Aircare 30
3	**digestive endoscopy ward n°2**	**4,9x3,5x2,9**	361 m^3/h	odour contamination with human presence	Aircare 30
4	**« small surgery ward »**	**3,3x4x2,5**	No MVC	odour contamination with human presence	Aircare 20
5	**Storage facilities of the dustbins**	**7x3x2,4**	No MVC	odour	Aircare 30
6	**Dirty linen storage room (intensive care unit) 1st floor**	**1,4x2,4x2,6**	28m^3/h	odour	Aircare 20
7	**Patients' ward (Intensive care unit)**	**4,3x4,6x2,7**	40 m^3/h	contamination with human presence	Biozone 45
8	**Patients' departure ward**	**4,3x4,6x2,7**	40 m^3/h	Final contamination	Powerzone PZ2
9	**Cloakroom**	**4,3x4,6x2,7**	none	odour	Biozone 45
10	**Surgery ward N°8**	**90** m^3	1026 m^3/h	Final contamination	Powerzone PZ2
11	**Surgery ward N°3**	**94** m^3	620 m^3/h	Final contamination	Powerzone PZ2
12	**Accountancy radiology**	**4,3x4,3x2,5**	80 m^3/h	odour mould	Biozone 90
13	**Toilet**	**2,10x1,7x2,7**	none	odour	Aircare 10

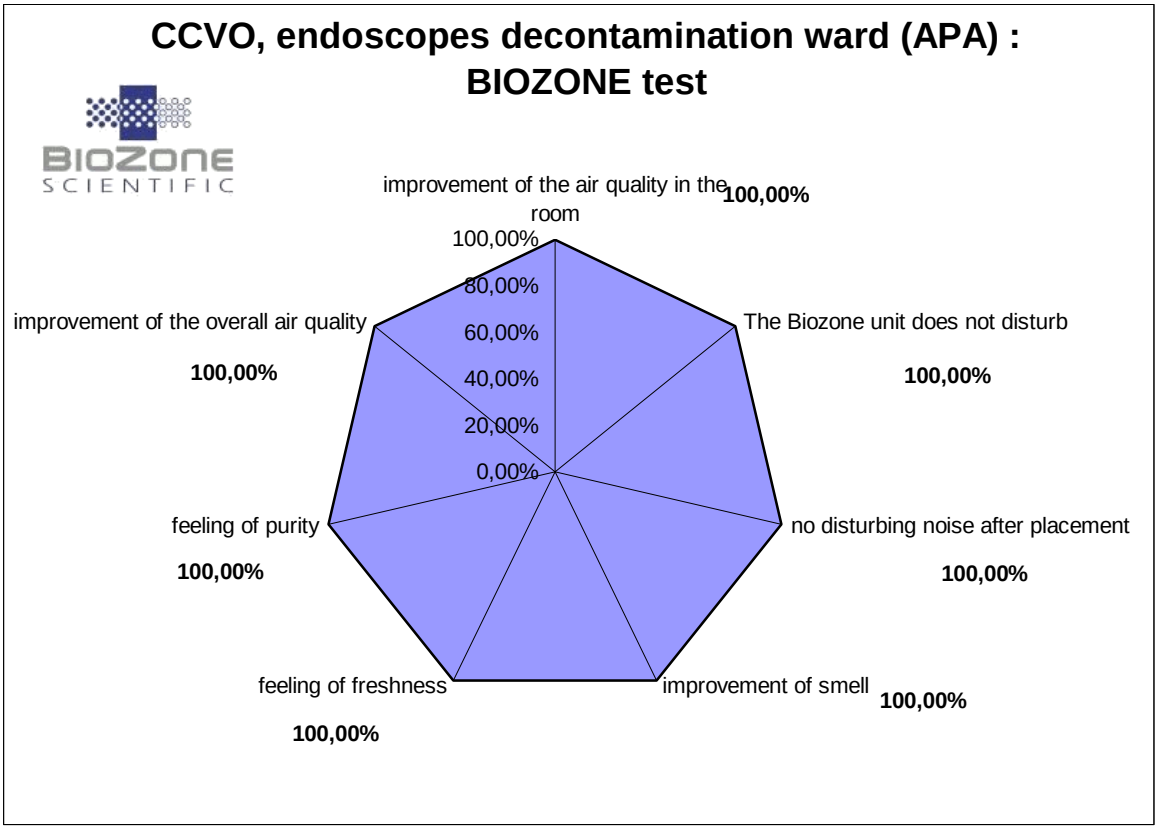
2) Protocol

The Biozone units were placed in agreement with the technical staff of the hospital.
On the first week, the users got used to the presence and use of the devices.
On the second and the third week, audits were conducted in the hospital to assess the efficiency of the placed units;
After one month, samples were taken by the Clean Concept company to demonstrate the efficiency of the devices.

3) Quality of life results

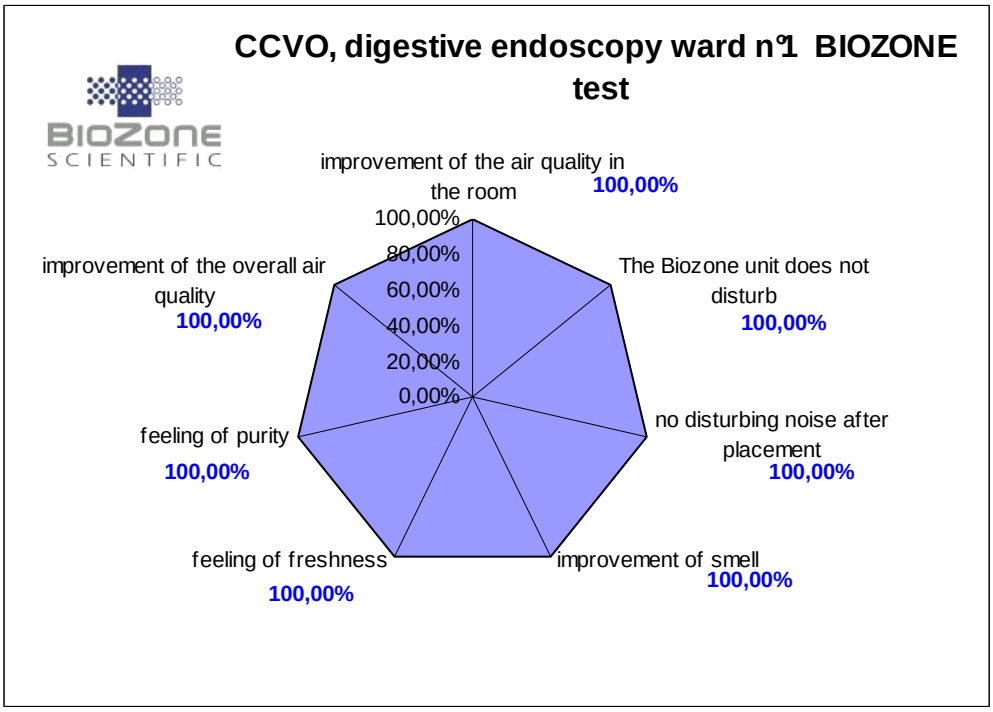
3-1) Endoscopes decontamination ward with A P A (APA)

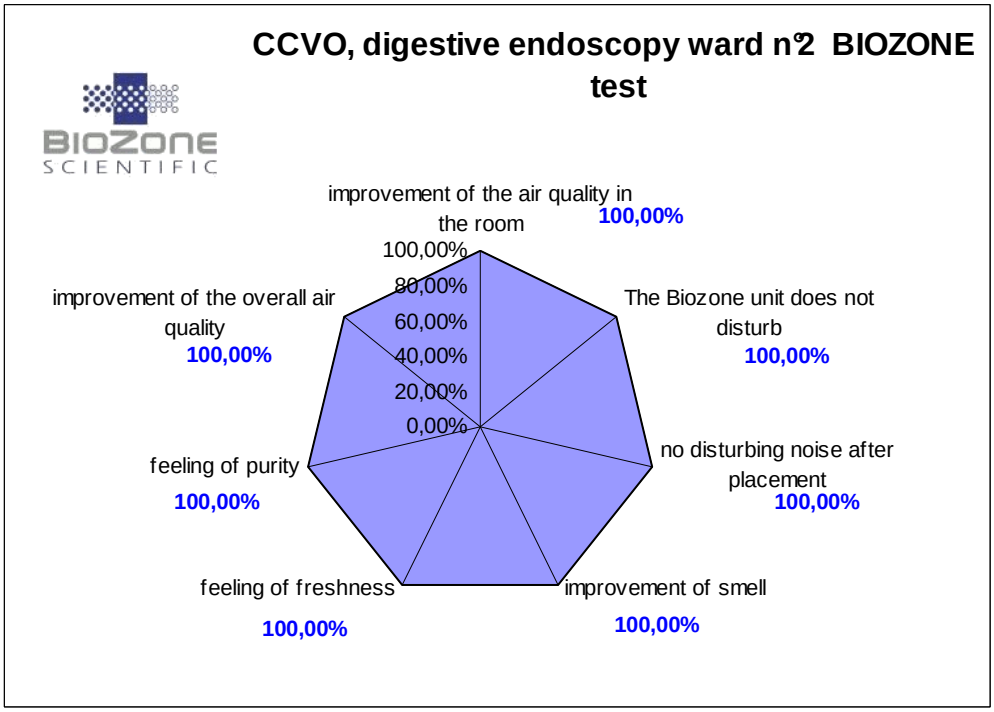
An AIRCARE 30 was placed above the endoscope cleaning machine.



Comments:
« APA does not make the nose sting any more, it is not disturbing any more. »

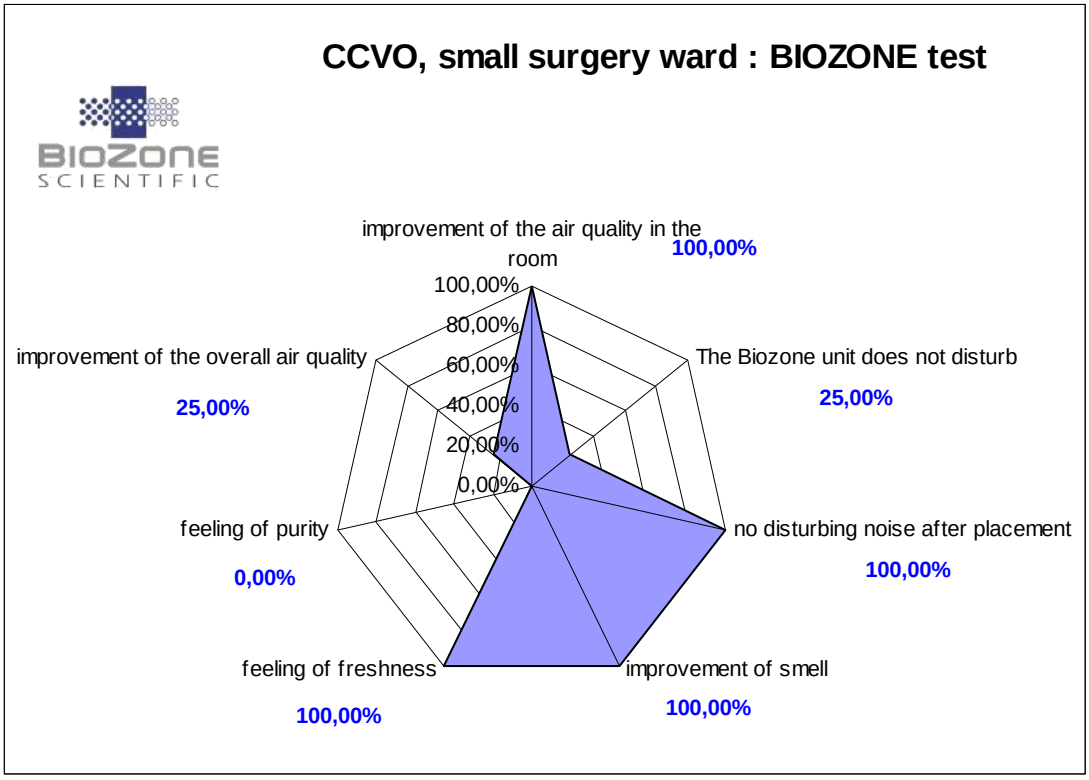
3-2) Endoscopy wards n°1 and n°2





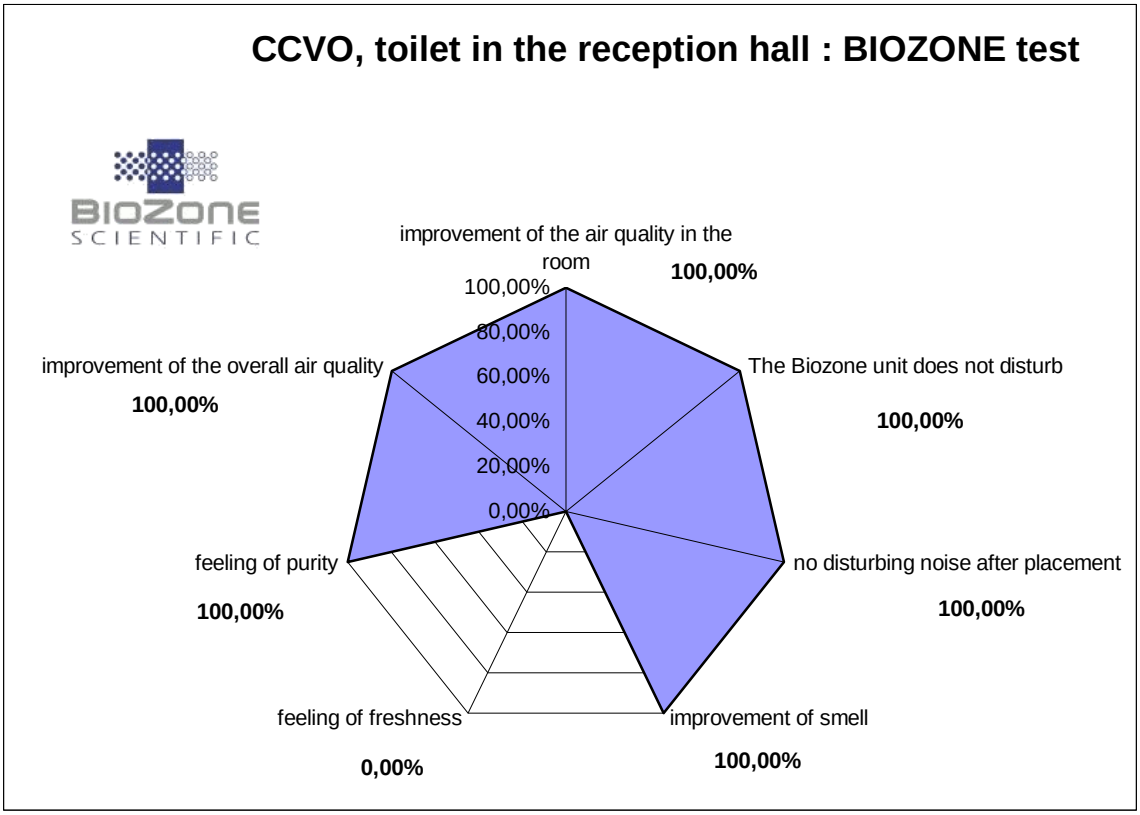
Conclusion:
There was no more unpleasant smell during medical examinations.

3-3) Small surgery ward



Conclusion:
It was a small room with a very low ventilation. The unit placed there was too powerful for the size of the room (21 m^3). We have to use a less powerful device.

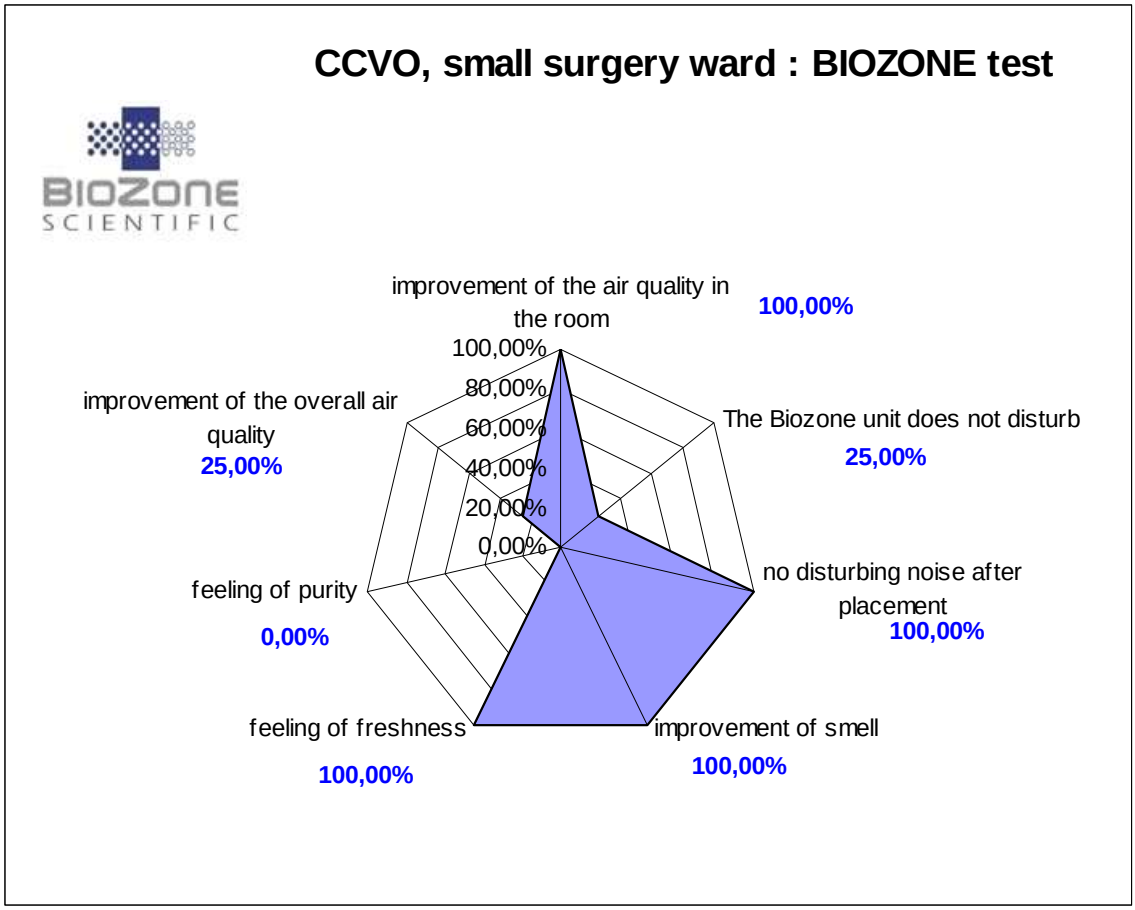
3-4) Toilet in the reception hall



Conclusion:

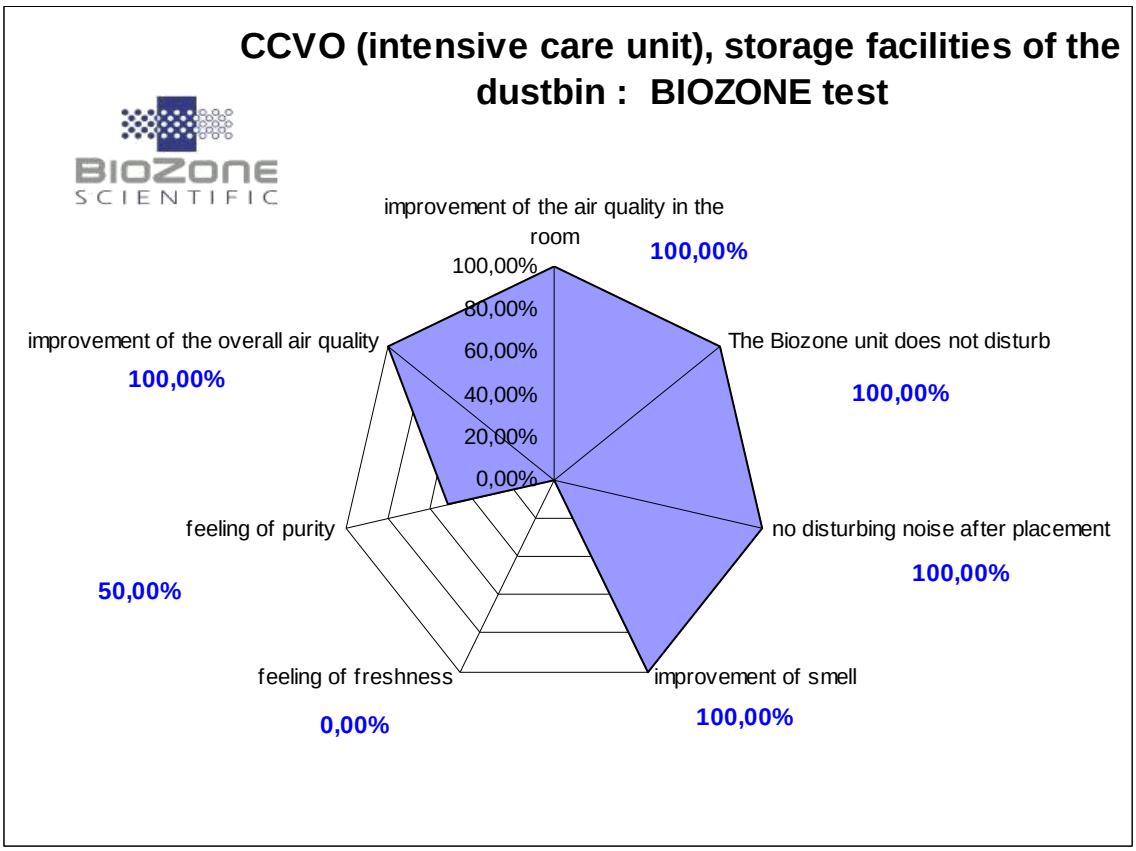
Before the AIRCARE 10 was placed, the reception hall was always polluted with unpleasant smells. The improvement was significant without any ventilation.

3-5) Women's cloakroom



Comment:
« We feel better in the room, the air seems lighter. ».

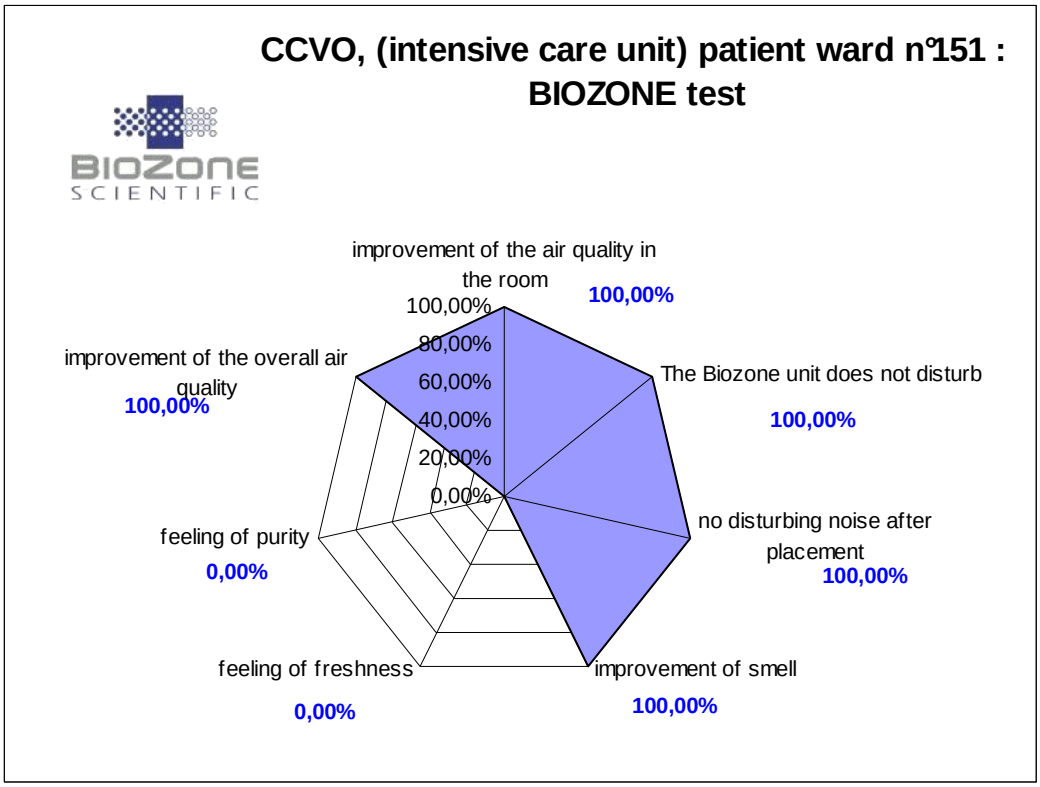
3-6) Intensive care unit: storage facilities of the dustbin



Conclusion:

AIRCARE was adapted to its use.

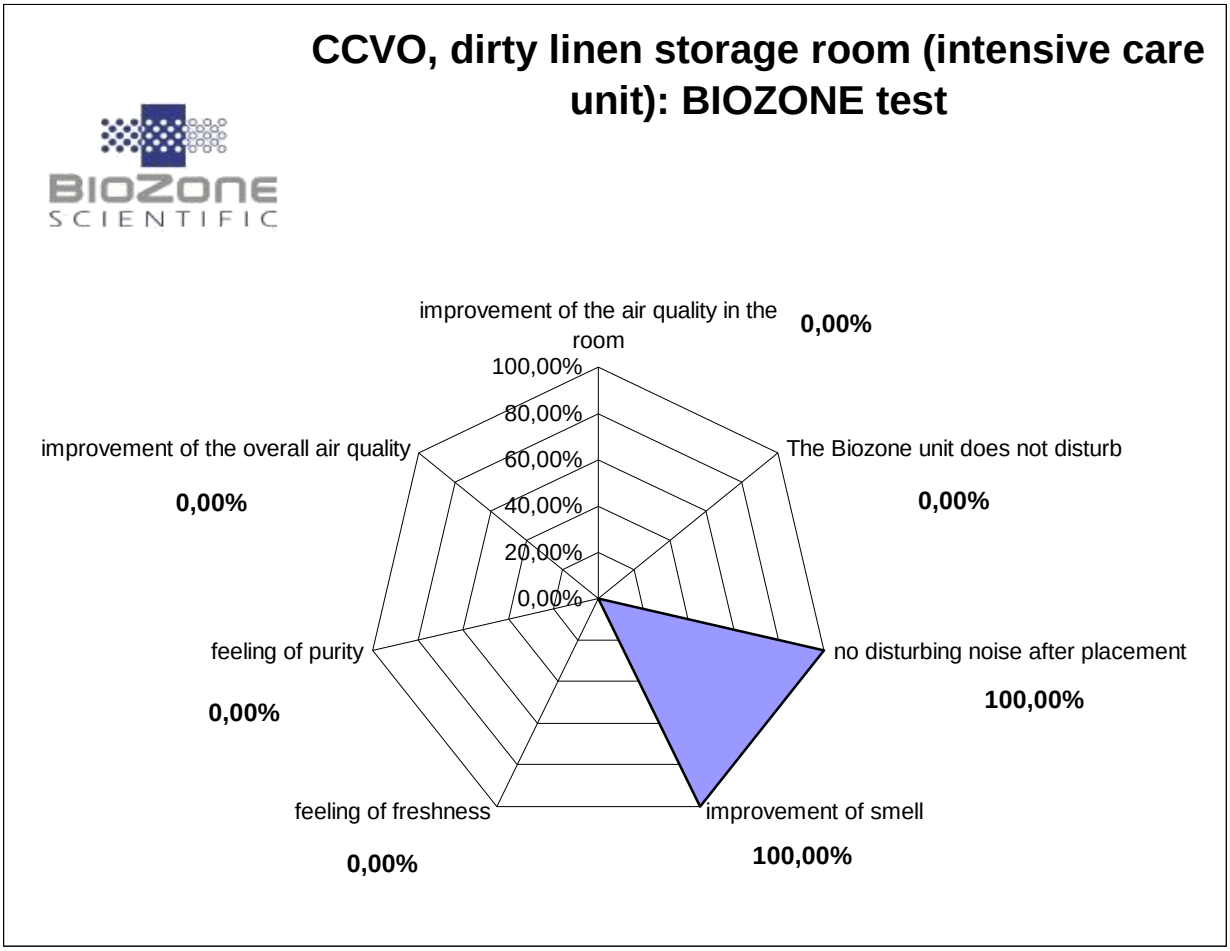
3-7) Intensive care unit: patient ward n°151



Conclusion:

« There are no more smells as before. »
« It's very good in the room. »

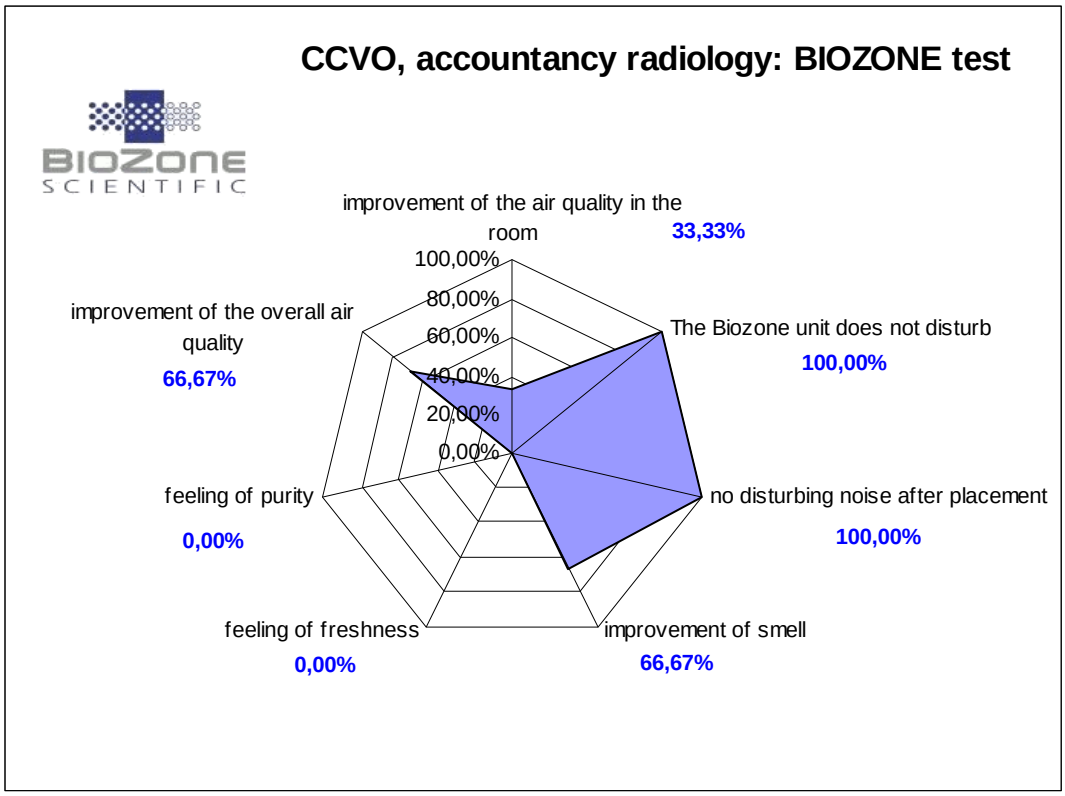
3-8) Intensive care unit: dirty linen storage room



Comments:

« The device smells too much and stings the nose, we turn it off very often. »
« It's disturbing, it runs too high. »
Conclusion: in a badly aired room, AIRCARE 30 has to be replaced by AIRCARE 10.

3-9) Accountancy radiology



Conclusion:

There was a terrible smell due to a leak in a rain water tank in the basement where the accountancy service is.
Due to the permanence of the smell pollution, the smell couldn't be treated.
The leak has to be mended first, then we will be able to remove the smell and the mould from the neaby rooms.

4) Results: samples

4-1 – TEST PURPOSE

Our purpose was to make particles and bacteria counts before and after the Biozone device was run in the buildings of the Val d'Or surgery private hospital.

4-2 - data

4-2.1 areas to be checked

- Post anesthesia recovery room 155
- Small surgery ward
- Endoscopy ward 1
- room 262
- surgery theatre n°3
- surgery theatre n°7

4-2.2 Measurements to be conducted

- counting of airborne particles
- temperature and humidity
- airborne contamination before and after the Biozone unit was run for some time.
- surface contamination before and after the Biozone unit was run for some time..

4-2.3 Standards:

- ISO 14 644 -1: 1999 (X 44 101) Classification of air cleanliness.
- ISO 14 644 -2: 2000 (X 44 102) Specification for testing and monitoring.
- ISO 14 644 -3: 2005 (X 44 103) Test methods.
- ISO 14 644 -4: 2001 (X 44 104) Design, construction and start up.
- ISO 14 698 -1: 2003 (X 44 110) Biocontamination control. General principles.
- ISO 14 698 -2: 2003 (X 44 111) Evaluation and interpretation of biocontamination data.
- NF S 90 351 : 2003 Etablissements de santé – Clean rooms and environmental control. Contamination control rules.
- Arrêté du 22 juin 2001 (2001 – BOS 2 BIS) relatif aux Bonnes Pratiques de Pharmacie Hospitalière.
- Guide des BPF

4-2.4 Other standards :

- ASPEC Recommandations : Etablissements de santé : Contrôles de l'environnement dans les zones à hauts et très hauts risques infectieux.
- SFHH GR-AIR Octobre 2004 : Recommandations d'expert sur la Qualité de l'air au Bloc Opératoire.
- Guide pratique UNICLIMA : Traitement de l'air en milieu hospitalier.

4-3 – Operating qualification:

It must demonstrate that the air purifying system can:

- Produce air in planned quantity (blown air volume) and quality (particle count).
- Control temperature, humidity and pressure data while it is being used.

4-3.1 Performance responsability

The CLEAN CONCEPT Mesures company is responsible for the performance of these tests.

4-3.2 Validation responsability

The principal is responsible for the validation of this document.

4-4 – Equipment

The countings described in 2-2 were performed with the following equipment:

4-4.1 Counting of airborne particles:

- Portable airborne particle counter Met-One 3313 SN 030401025 – flow rate : 28,3 litres per minute - 6 particle size channels : ≥ 0,3 µm, ≥ 0,5 µm, ≥1,0 µm, ≥3,0 µm, ≥5,0 µm and ≥10,0 µm
- Sensitivity 0.3 µm
- Counting efficiency: 50% for 0,3 µm et 100% for 0.45 µm particles.
- Coincidence loss: < 5 % at 400 000 particles /ft^3 (>14 000 000 particules / $m^{3)}$.

4-4.2 Thermo hygrometer:

- AMI 301 n°03120340
- Temperature measuring range : -20 to + 80°C, display resolution ± 2% ± 0,1°C, accuracy 0,1°C
- Humidity measuring range : 3 to 98% rF, display resolution ± 1%, accuracy 0,1% rF.

4-4.3 Air sampler :

- Sieve air sampler SAMPL'AIR MK2 n° 41671588 of AES Laboratoire with two sampling heads, n° 41671613d and 41671588d using 90 mm Petri dish.

4-4. 4 Culture media and conditions:

Culture media and conditions:

1 – Airborne contamination:

Sought flora	Culture medium	temperature	Incubation time
Aerobic mesophiliac flora	Tryptic Soy Agar (TSA)	30 +/- 1 °C	72 hours
Yeast and mould	Yeast Extract Glucose Chloramphenicol Agar	25 °C +/- 1°C	5 days

2 – microbiological control of surfaces :

Sought flora	Culture media	Temperature	Incubation time
surface germ	Hygicount Agar	30 +/- 1 °C	72 hours

Yeast and mould	Sabouraud Chloramphenicol Agar	25 °C +/- 1°C	5 days

3 – References:

Name	Reference	Lot n°	Out of date on
TCA	AEB522860	719938	17/10/07
Yeast Extract Agar	AEB121700	719922	17/10/07
HYGICOUNT Agar	AEB130140C	719710	30/10/07
SABOURAUD Agar	AEB122360C	718335	01/10/07

4 – Counting of the colonies:
The colonies were counted manually without algorythm of the Peto and Powel type.

4-5 METHODS

4-5.1 Air dust: particle sample

The minimum number of locations (N_L) was function of the area (A) of the room to be tested ($N_L = \sqrt{A}$ rounded to the next superior number - ISO 14644-1). The different samples were taken for on minute each at a 1.20 meter height, with a 1 mfpm flow (28.3 liters per minute). A 28.3 liter air sample was taken at each sample location.

4-5.2 Temperature, humidity

The temperature and humidity measurements were taken at the center of each room.

4-5.3 Airborne contamination

The flow of the air sampler was set at 100 litres per minute; for a duration of 10 minutes, corresponding to a sample of 1 cubic meter (1000 litres). The air samples were taken at about 1 meter above the ground and at a distance of 40 cm of the ventilating spouts.
The surface measurements were made with the print method on flat surfaces with one applicator by Petri dish.
The media are agar plus nutrient and selective agar.
Information :
Standard NF S 90-351:2003

Bacteria category	Viable particles maximum concentration number Cfu/m^3
B100	100
B10	10
B1	1

Risky areas: definition according to the standard NF EN ISO 14698-1 : 1999(X 44-101)

category	ZONES	cfu/m^3
Zone 4	Very high infectious risk area	10 (B10)
Zone 3	high infectious risk area	10 (B10)
Zone 2	Medium risk area	100 (B100)

Zone 1	Unclassified area	-

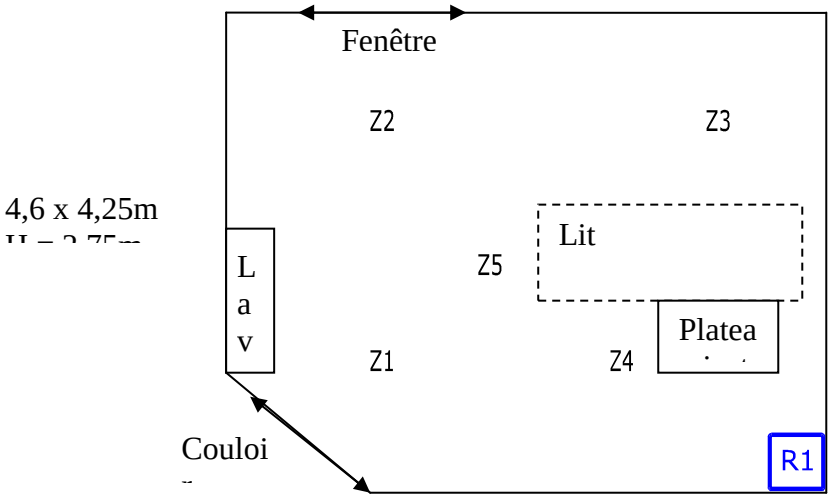
Surfaces control: ASPEC recommendation **out of human presence**:

	high infectious risk area		Very high infectious risk area	
	Bacteria CFU/ dish	Mould CFU/ dish	Bacteria CFU/ dish	mould CFU/ dish
Action level	25	1	10	1
Alarm level	10	1	5	1
Target level	5	<1	<1	<1

Surfaces control: ASPEC recommendation **with human presence**:

high infectious risk area	10 CFU by dish
Very high infectious risk area	1 CFU by dish

4-6) intensive care unit n°155



physical data of the area :

RH %	°C	Humidity g/Kg	Dew point°C
58,9	24,0	11,3	15,3

Measures before the Biozone was run:

	> 0,3 µm	>0,5µm	>1µm	>3µm	>5µm	>10µm
Z1	1186595	109767	24307	1971	642	107
Z2	1152438	100808	22329	1764	579	113
Z3	1157515	103811	23519	1752	561	80
Z4	1138147	100169	22803	1717	587	100
Z5	1132925	98309	22091	1489	446	67
Average for 28,3 l	1 153 524,000	102 572,800	23 009,800	1 738,600	563,000	93,400
Average for 1m^3	40 760 565	3 624 481	**813 067**	**61 435**	**19 894**	**3 300**
Standard deviation s	21045	4482	907		72	
LSC at 95 %	40 780 330	3 628 690	813 919		19 962	
ISO Category	**na**	**9**	**8**	**na**	**8**	**na**

Zone category: **ISO 9** at 0,5µm

Measures after the Biozone was run:

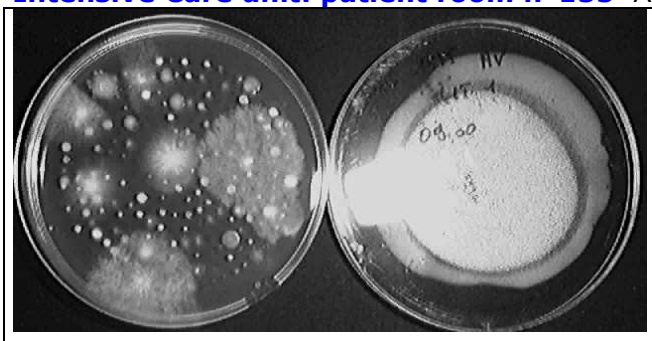
	> 0,3 µm	>0,5µm	>1µm	>3µm	>5µm	>10µm
Z1	1141939	61356	8923	641	212	30
Z2	1110881	58051	8832	776	319	66
Z3	1105256	58271	9376	831	277	44
Z4	1100639	58037	9227	880	383	92
Z5	1090691	57620	9660	960	398	74
Average for 28,3 l	1 109 881,200	58 667,000	9 203,600	817,600	317,800	61,200
Average for 1m^3	39 218 417	2 073 039	**325 216**	**28 890**	**11 230**	**2 163**
Standard deviation s	19389	1522	337		77	
LSC à 95 %	39 236 626	2 074 468	325 532		11 302	
ISO Category	**na**	**8**	**8**	**na**	**8**	**na**

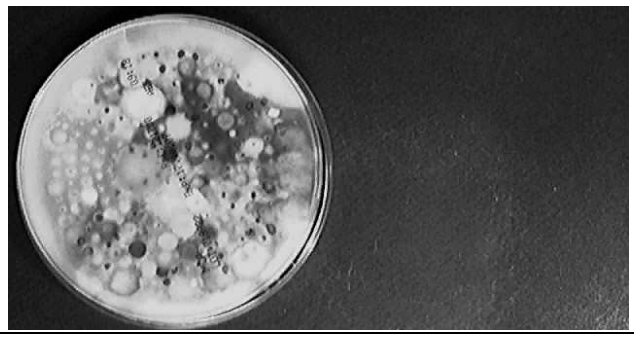
Zone category: **ISO 8** at 0,5µm

			>1µm	>3µm	>5µm	>10µm
Reduction percentage	**Ch 155**	**PZ2 : 1H50**	**60,00%**	**52,97%**	**43,55%**	**34,45%**

Airborne biological contamination

Intensive Care unit: patient room n°155 Air : **before** BioZone sample 1 above the bed





Aerobic mesophiliac flora		**Yeast and mould**	
TCS	146 cfu/m^3	MCA	170 cfu/m^3

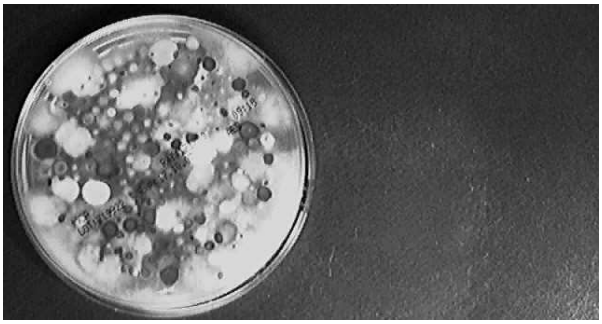
Intensive Care unit: patient room n°155 Air: **after** BioZone (1H 50mn) sample 1 above the bed

Aerobic mesophiliac flora		**Yeast and mould**	
TCS	44 cfu/m^3	MCA	49 cfu/m^3

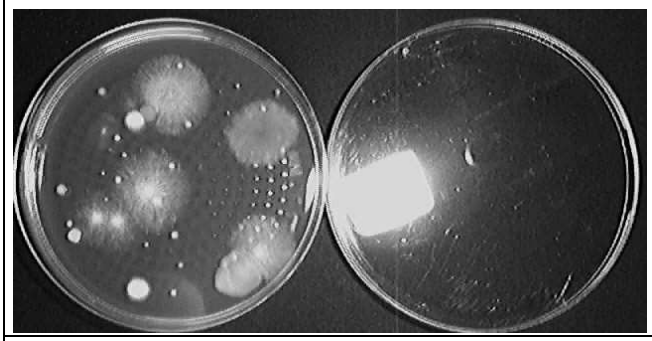
Reduction of 142 cfu/m^3 for Aerobic mesophiliac flora: Reduction of 69,86%

Reduction of 121 cfu/m^3 for yeast and mould: Reduction of 71,18%

Intensive Care unit: patient room n°155 Air: **before** BioZone sample 2 above the bed

			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	107 cfu/m^3	MCA	176 cfu/m^3

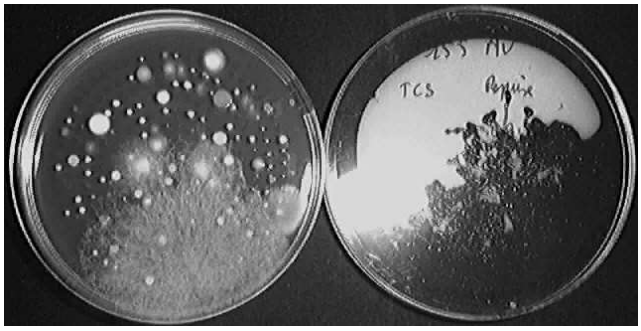
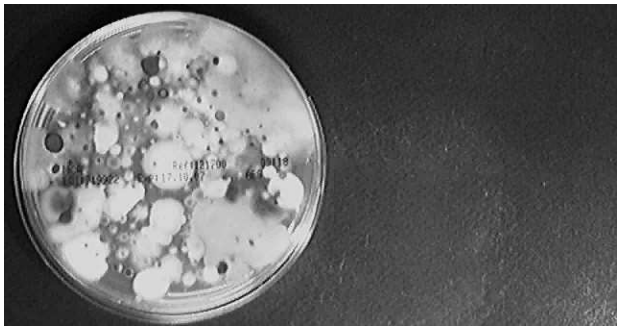
Intensive Care unit: patient room n°155 Air: **After** BioZone (1H 50mn) sample 2 above the bed

			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	38 cfu/m^3	MCA	53 cfu/m^3

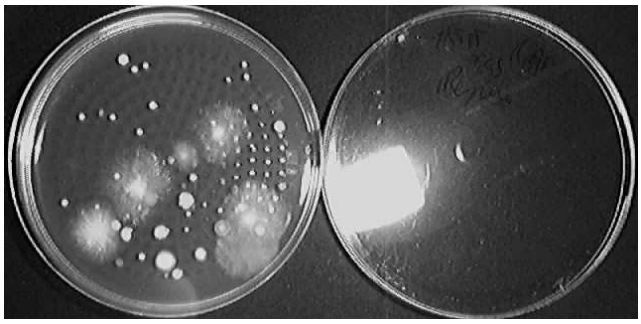
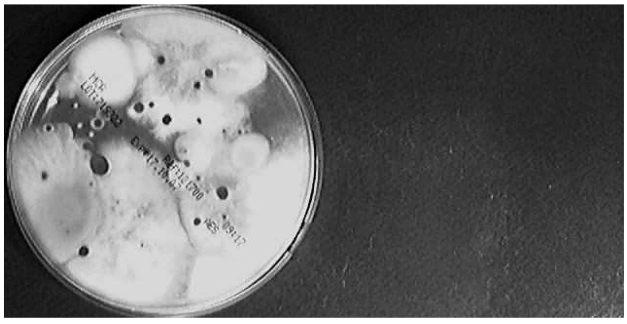
Reduction of 64,49% for aerobic mesophiliac flora

Reduction of 69,89% for yeast and mould

Intensive Care unit: patient room n°155 Air: **Before** BioZone near the return air grill

			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	105 cfu/m^3	MCA	146 cfu/m^3

Intensive Care unit: patient room n°155 Air: **After** BioZone (1H 50mn) near the return air grill

			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	56 cfu/m^3	MCA	50 cfu/m^3

Reduction of 46,67% for aerobic mesophiliac flora

Reduction of 65,75% for yeast and mould

Surface samples :

Intensive Care unit: patient room n°155 Surface: **Before** BioZone surgery instruments table

Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	++++ cfu/23,7 cm²	Sabouraud	++++ cfu/m^3

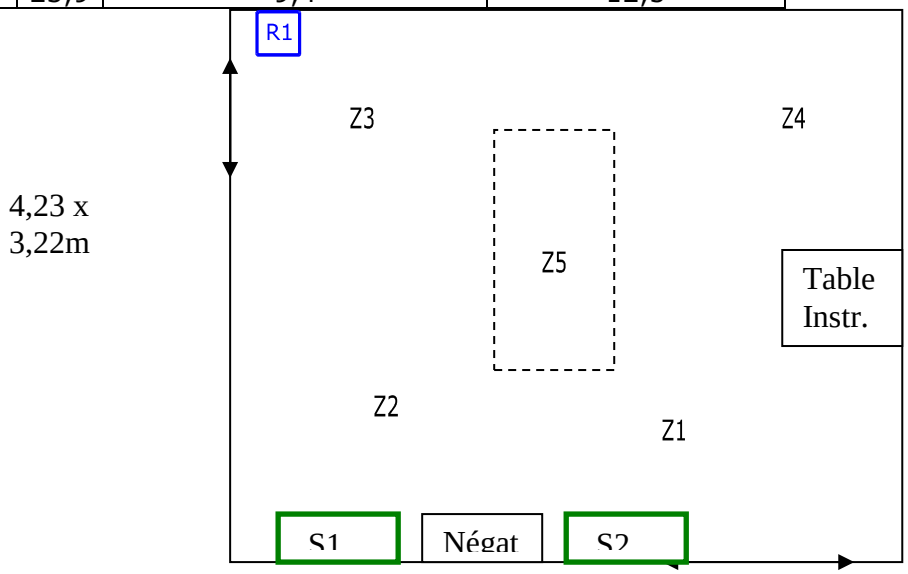
Intensive Care unit: patient room n°155 Surface: **After** BioZone (1H 50mn) surgery instruments table

Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	5 cfu/23,7 cm²	Sabouraud	3 cfu/m^3

4-7) day care service: endoscopy room n°1

physical data of the area :

RH %	°C	humidity g/Kg	Dew point °C
49,3	23,9	9,4	12,5



	Volume M3 Zone	blowing flow M3/h	Aspiration flow M3/h	Hourly renewal rate	delta P in pascal	Filter type
Endoscopy n°1	**39,4**	**351**	**862**	**8,9**	**- 7**	**Absolute filters : GPA 003**

Measures before BioZone :

	> 0,3 µm	>0,5µm	>1µm	>3µm	>5µm	>10µm
Z1	1025100	74521	17415	1404	471	63
Z2	979574	67682	15674	1314	414	68
Z3	926489	60964	13831	1180	379	66
Z4	883674	55334	12231	1074	391	61
Z5	850003	50452	10864	913	340	60
Average for 28,3 l	932 968,000	61 790,600	14 003,000	1 177,000	399,000	63,600
Average for 1m^3	32 967 067	2 183 413	**494 806**	**41 590**	**14 099**	**2 247**
Standard deviation s	70738	9588	2620		48	
LSC à 95 %	33 033 501	2 192 418	497 266		14 144	
ISO Category	**na**	**8**	**8**	**na**	**8**	**na**

zone category: **ISO 8** à 0,5µm

Measure after BioZone :

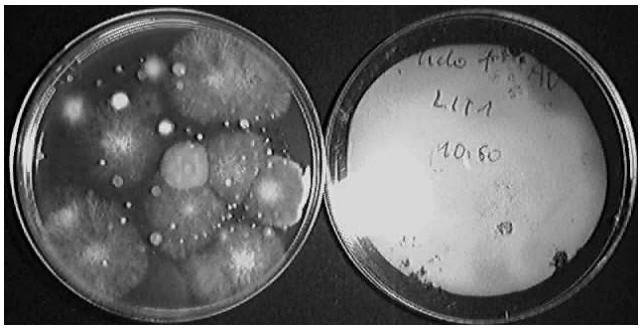
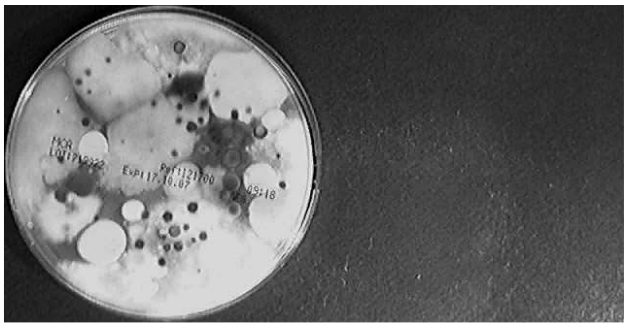
	> 0,3 µm	>0,5µm	>1µm	>3µm	>5µm	>10µm
Z1	796382	26035	2769	243	115	25
Z2	798349	26262	3016	304	148	36
Z3	792715	26090	3061	342	170	43
Z4	781616	25815	3198	419	224	77
Z5	779732	25655	3073	362	172	47
Average for 28,3 l	789 758,800	25 971,400	3 023,400	334,000	165,800	45,600
Average for 1m^3	27 906 671	917 717	**106 834**	**11 802**	**5 859**	**1 611**
Standard deviation s	8562	238	157		40	
LSC à 95 %	27 914 712	917 941	106 982		5 896	
ISO Category	**na**	**8**	**8**	**na**	**8**	**na**

Zone category : **ISO 8** à 0,5µm

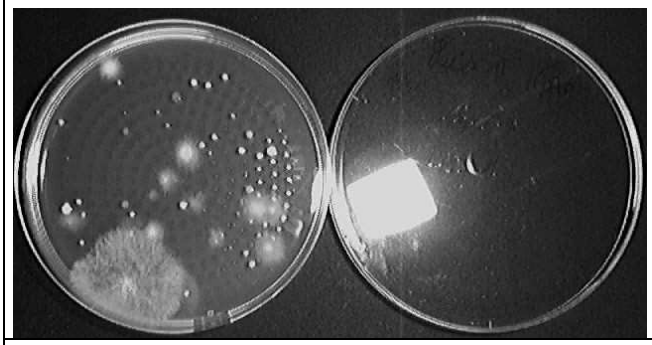
			>1µm	>3µm	>5µm	>10µm
Reduction percentage	**Endoscopy 1**	**PZ2 : 3H**	**14,47%**	**44,36%**	**56,69%**	**69,29%**

Airborne contamination

Digestive endoscopy ward n°1 Air: **Before** BioZone sample 1 above the bed

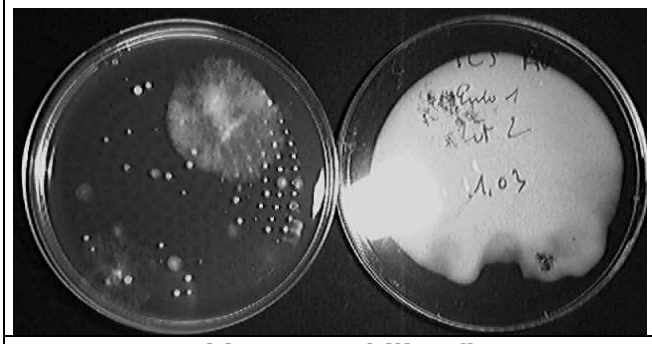
			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	58 cfu/m^3	MCA	86 cfu/m^3

Digestive endoscopy ward n°1 Air: **After** BioZone (3H) sample 1 above the bed

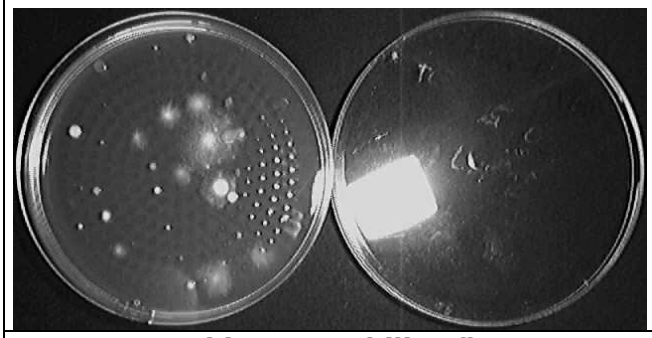
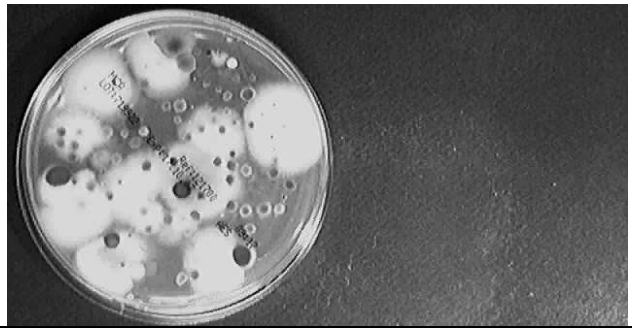
			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	46 cfu/m^3	MCA	117 cfu/m^3

Reduction of 20,69% for aerobic mesophiliac flora

Digestive endoscopy ward n°1 Air: Before BioZone sample 2 above the bed

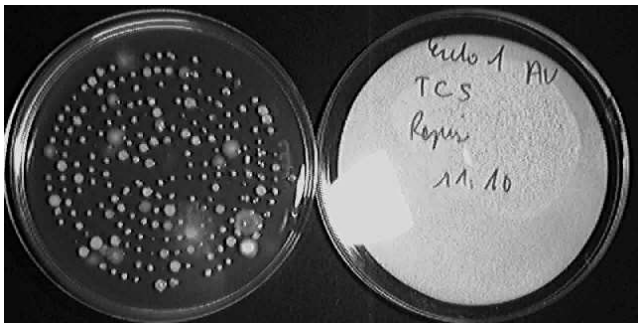
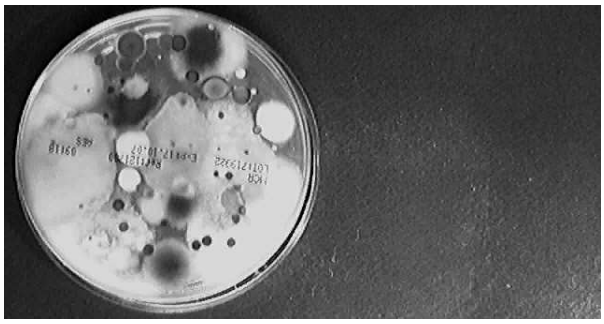
			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	44 cfu/m^3	MCA	59 cfu/m^3

Digestive endoscopy ward n°1 Air: **After** BioZone (3H) sample 2 above the bed

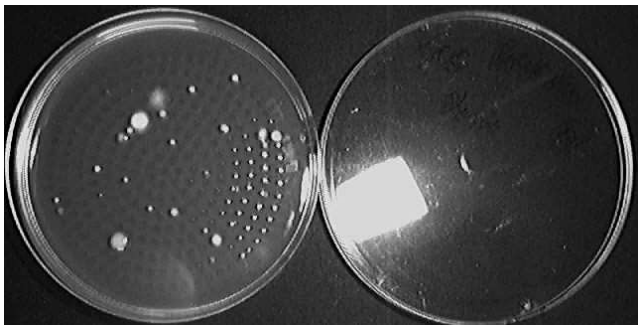
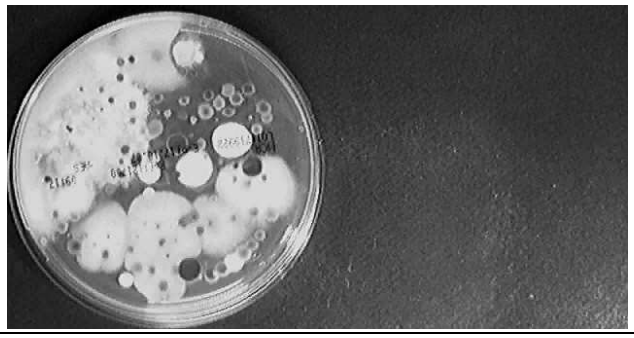
			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	37 cfu/m^3	MCA	92 cfu/m^3

Reduction of 15,91% for aerobic mesophiliac flora

Digestive endoscopy ward n°1 Air : **Before** BioZone near the return air grill

			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	219 cfu/m^3	MCA	61 cfu/m^3

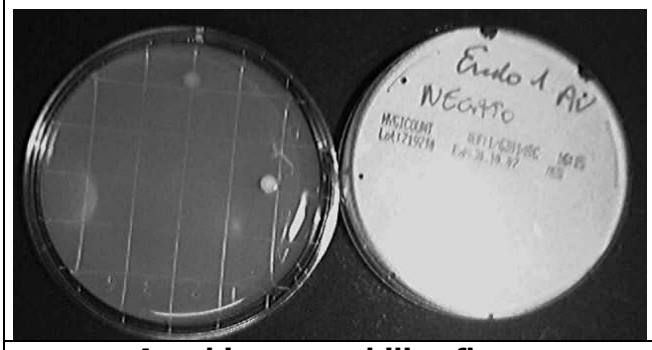
Digestive endoscopy ward n°1 Air: **After** BioZone (3H) near the return air grill

			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	62 cfu/m^3	MCA	95 cfu/m^3

Reduction of 71,69% for aerobic mesophiliac flora

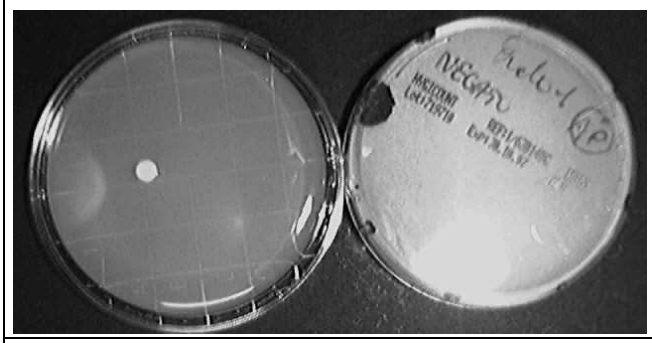
Surface samples:

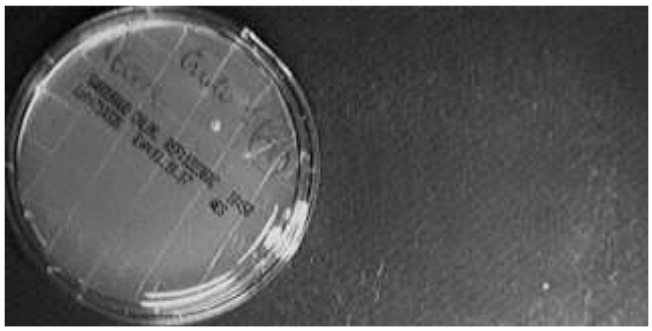
Digestive endoscopy ward n°1 Surface: **Before** BioZone Negatoscope



Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	1 cfu/23,7 cm²	Sabouraud	4 cfu/m^3

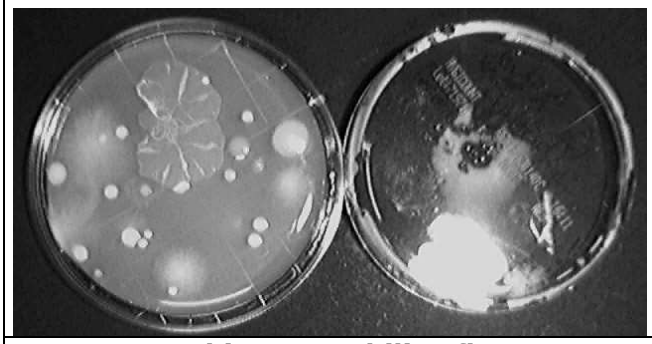
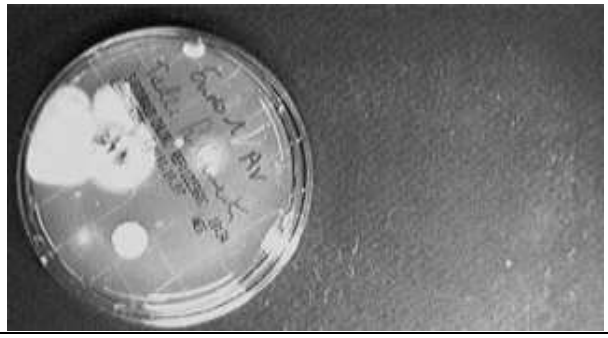
Digestive endoscopy ward n°1 Surface: **After** BioZone (3H) Negatoscope



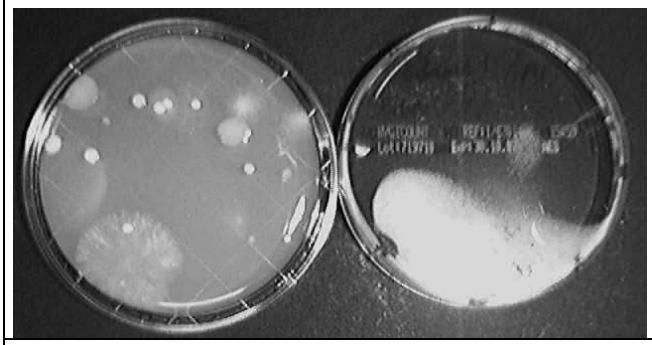


Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	1 cfu/23,7 cm²	Sabouraud	1 cfu/m^3

Digestive endoscopy ward n°1 Surface: **Before** BioZone Instrument table

			
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	25 cfu/23,7 cm²	Sabouraud	13 cfu/m^3

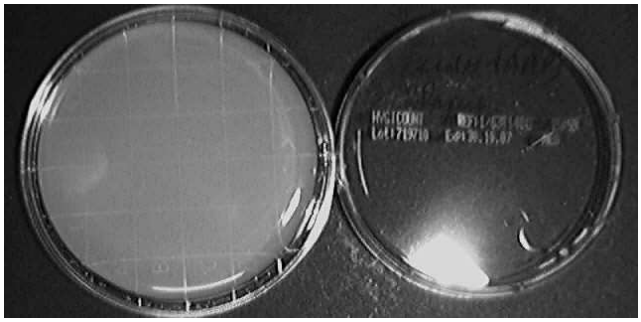
Digestive endoscopy ward n°1 Surface: **After** BioZone (3H) Instrument table

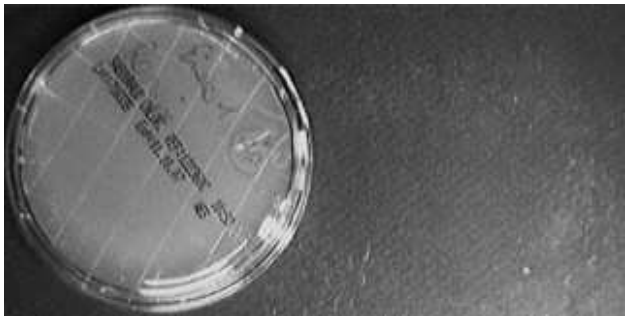
			
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	17 cfu/23,7 cm²	Sabouraud	8 cfu/m^3

Digestive endoscopy ward n°1 Surface: **Before** BioZone return air grill

Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	1 cfu/23,7 cm²	Sabouraud	2 cfu/m^3

Digestive endoscopy ward n°1 Surface: **After** BioZone (3H) return air grill





Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	<1 cfu/23,7 cm²	Sabouraud	1 cfu/m^3

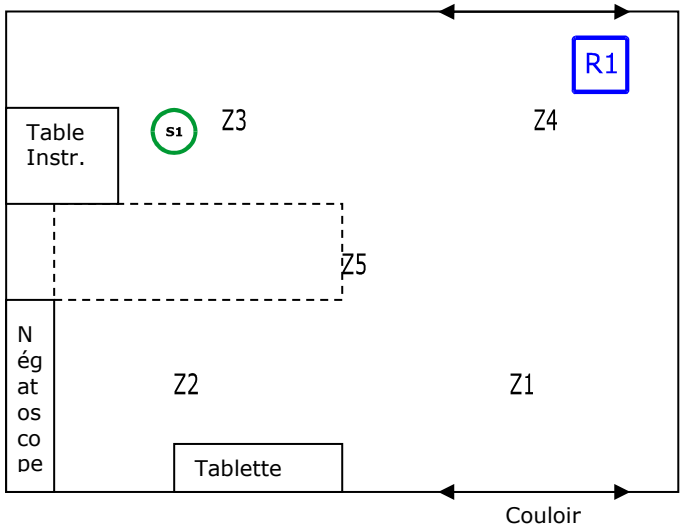
4-8) Day care service: small surgery ward

area physical data :

RH %	°C	humidity g/Kg	Dew point °C
50,2	24,5	10,0	13,5

Aspiration 5 vol/hour , no ventilation or filter

3,17 x 3,5m
h= 2,69m



Measures before BioZone :

	> 0,3 µm	>0,5µm	>1µm	>3µm	>5µm	>10µm
Z1	1025100	74521	17415	1404	471	63
Z2	979574	67682	15674	1314	414	68
Z3	926489	60964	13831	1180	379	66
Z4	883674	55334	12231	1074	391	61
Z5	850003	50452	10864	913	340	60
Average for 28,3 l	932 968,000	61 790,600	14 003,000	1 177,000	399,000	63,600
Average for 1m^3	32 967 067	2 183 413	**494 806**	**41 590**	**14 099**	**2 247**
Standard deviation s	70738	9588	2620		48	
LSC at 95 %	33 033 501	2 192 418	497 266		14 144	
ISO Category	**na**	**8**	**8**	**na**	**8**	**na**

Zone category : **ISO 8** à 0,5µm

Measures after BioZone:

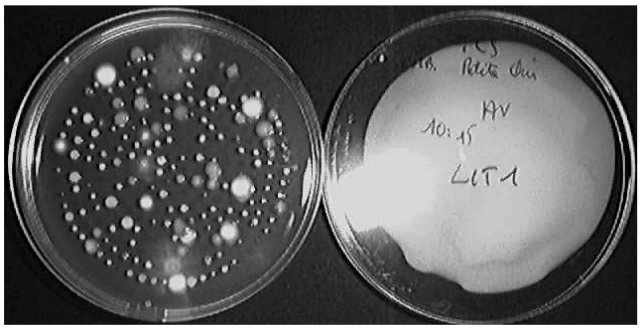
	> 0,3 µm	>0,5µm	>1µm	>3µm	>5µm	>10µm
Z1	796382	26035	2769	243	115	25
Z2	798349	26262	3016	304	148	36
Z3	792715	26090	3061	342	170	43
Z4	781616	25815	3198	419	224	77
Z5	779732	25655	3073	362	172	47
Average for 28,3 l	789 758,800	25 971,400	3 023,400	334,000	165,800	45,600
Average for 1m^3	27 906 671	917 717	**106 834**	**11 802**	**5 859**	**1 611**
Standard deviation s	8562	238	157		40	
LSC at 95 %	27 914 712	917 941	106 982		5 896	
ISO Category	**na**	**8**	**8**	**na**	**8**	**na**

Zone category: **ISO 8** at 0,5µm

			>1µm	>3µm	>5µm	>10µm
Reduction percentage	**Small surgery**	**Aircare(i) : 4H30**	**78,41%**	**71,62%**	**58,44%**	**28,30%**

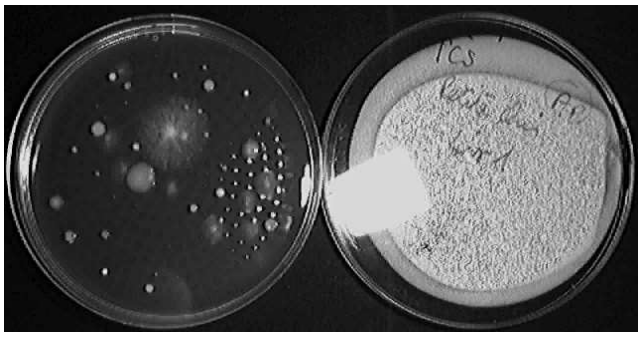
Airborne contamination

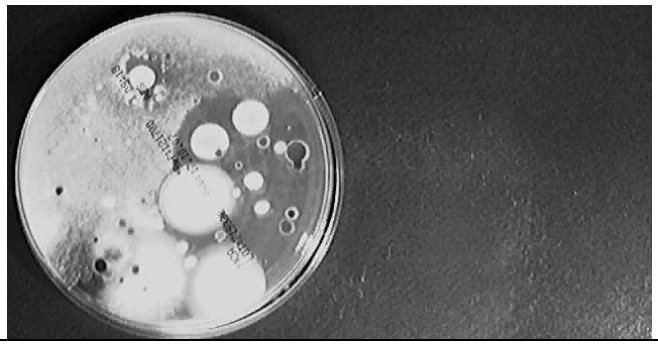
Small surgery ward Air: **Before** BioZone sample 1 above the bed



Aerobic mesophiliac flora		**Yeast and mould**	
TCS	166 cfu/m^3	MCA	40 cfu/m^3

Small surgery ward Air: **After** BioZone (4H 30mn) sample 1 above the bed

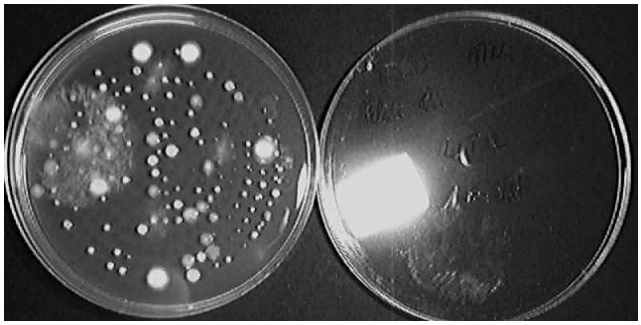
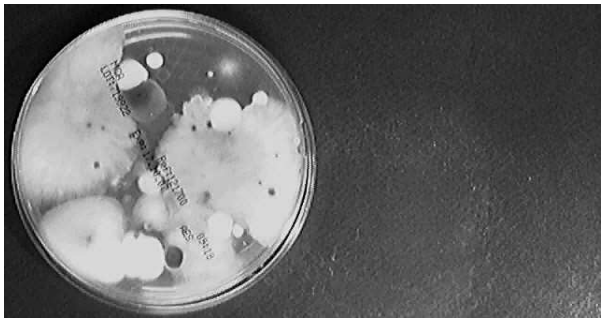




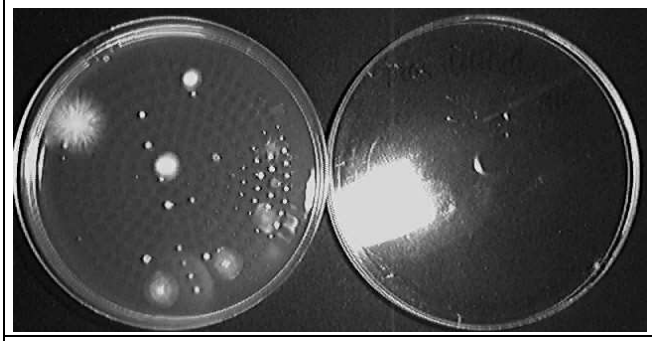
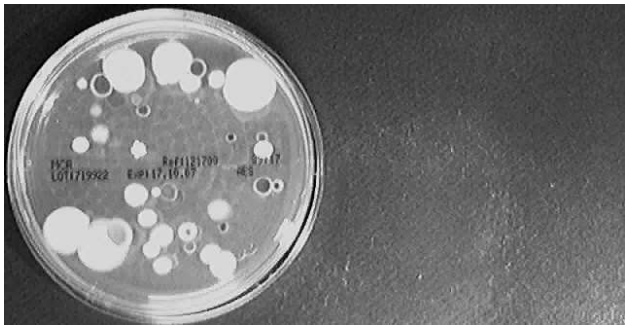
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	45 cfu/m^3	MCA	43 cfu/m^3

Reduction of 72,89% for aerobic mesophiliac flora

Small surgery ward Air: **Before** BioZone sample 2 above the bed

			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	125 cfu/m^3	MCA	34 cfu/m^3

Small surgery ward Air: **After** BioZone (4H 30mn) sample 2 above the bed

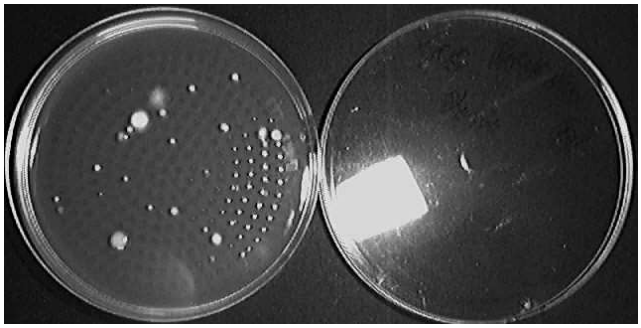
			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	27 cfu/m^3	MCA	35 cfu/m^3

Reduction of 78,40% for aerobic mesophiliac flora

Small surgery ward Air: **Before** BioZone near the return air grill

			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	70 cfu/m^3	MCA	32 cfu/m^3

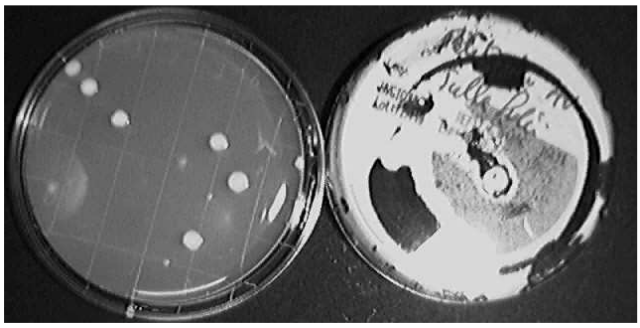
Small surgery ward Air: **After** BioZone (4H 30mn) niveau near the return air grill

			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	31 cfu/m^3	MCA	32 cfu/m^3

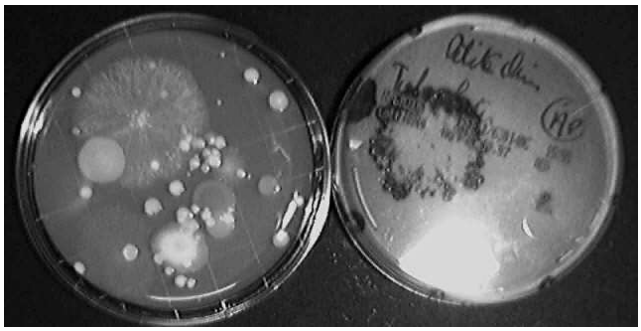
Reduction of 55,71% for aerobic mesophiliac flora

Surface samples

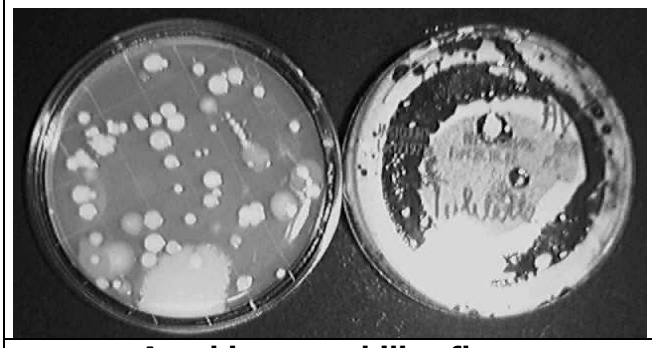
Small surgery ward Surface: **Before** BioZone instrument table

			
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	12 cfu/23,7 cm²	Sabouraud	15 cfu/m^3

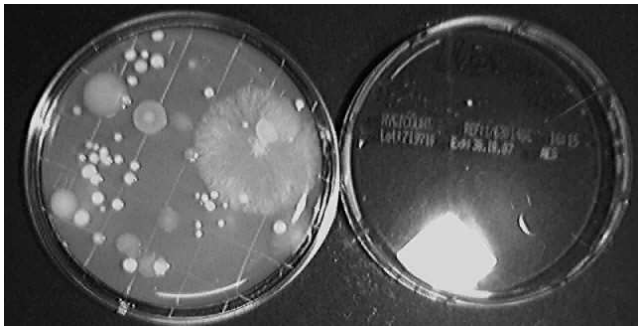
Small surgery ward Surface: **After** BioZone (4H 30mn) instrument table

			
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	46 cfu/23,7 cm²	Sabouraud	11 cfu/m^3

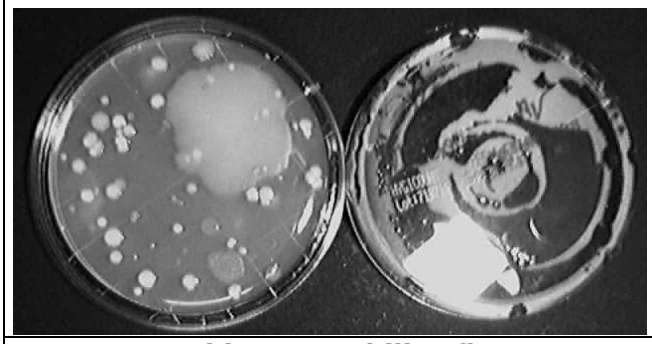
Small surgery ward Surface: **Before** BioZone table

			
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	++ cfu/23,7 cm²	Sabouraud	<1 cfu/m^3

Small surgery ward Surface: **After** BioZone (4H 30mn) Table

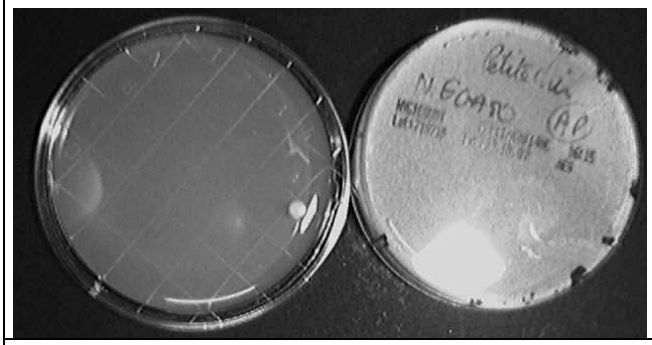
			
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	++ cfu/23,7 cm²	Sabouraud	10 cfu/m^3

Small surgery ward Surface: **Before** BioZone Negatoscope



Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	++ cfu/23,7 cm²	Sabouraud	2 cfu/m^3

Small surgery ward Surface: **After** BioZone (4H 30mn) Negatoscope



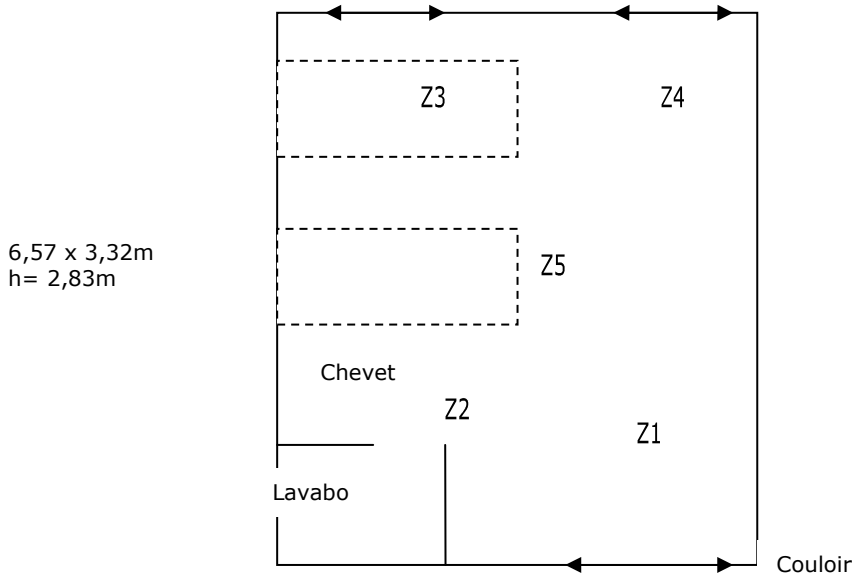
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	1 cfu/23,7 cm²	Sabouraud	<1 cfu/m^3

4-9) general practise service: room n°262

physical data of the area :

VMC Aspiration in bathroom 5vol/H

RH %	°C	humidity g/Kg	Dew point °C
45,8	25,2	9,5	12,5



REPORT

BIOZONE tests

Measure before BioZone :

	> 0,3 µm	>0,5µm	>1µm	>3µm	>5µm	>10µm
Z1	811350	51675	12276	1186	399	61
Z2	796836	50078	12027	1333	485	81
Z3	790320	50203	12873	1517	637	128
Z4	798640	50891	13048	1627	671	176
Z5	790589	51112	13561	1760	707	169
Average for 28,3 l	797 547,000	50 791,800	12 757,000	1 484,600	579,800	123,000
Average for 1m^3	28 181 873	1 794 763	**450 777**	**52 459**	**20 488**	**4 346**
Standard deviation s	8557	661	614		132	
LSC at 95 %	28 189 909	1 795 384	451 354		20 611	
ISO Category	**na**	**8**	**8**	**na**	**8**	**na**

Area category: **ISO 8** à 0,5µm

Measure after BioZone:

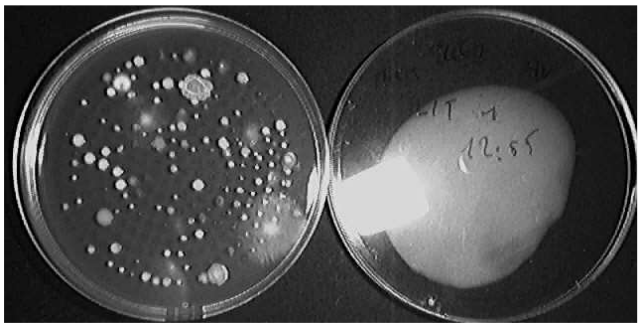
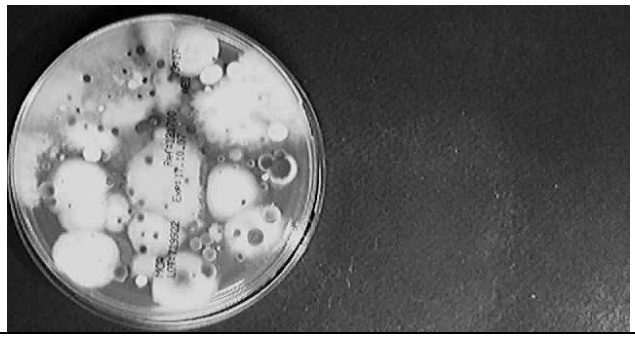
	> 0,3 µm	>0,5µm	>1µm	>3µm	>5µm	>10µm
Z1	1072874	51986	8764	664	206	34
Z2	1057174	51125	8862	761	267	47
Z3	1083685	52278	9277	852	322	71
Z4	1145281	50224	8991	1160	632	330
Z5	1069845	51781	9358	942	385	107
Average for 28,3 l	1 085 771,800	51 478,800	9 050,400	875,800	362,400	117,800
Average for 1m^3	38 366 495	1 819 039	**319 802**	**30 947**	**12 806**	**4 163**
Standard deviation s	34582	820	258		165	
LSC at 95 %	38 398 972	1 819 809	320 045		12 960	
ISO Category	**na**	**8**	**8**	**na**	**8**	**na**

Zone category: **ISO 8** at 0,5µm

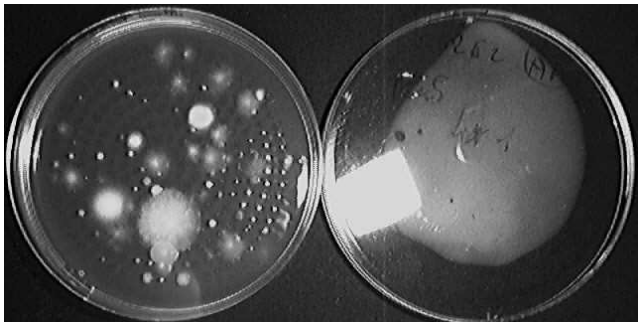
			>1µm	>3µm	>5µm	>10µm
Reduction percentage	**Room 262**	**Aircare : 2H40**	**29,06%**	**41,01%**	**37,50%**	**4,21%**

Airborne contamination

Patient ward n°262 Air: **Before** BioZone sample 1 above the bed

			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	119 cfu/m^3	MCA	112 cfu/m^3

Patient ward n°262 Air: **After** BioZone (2H40mn) sample 1 above the bed

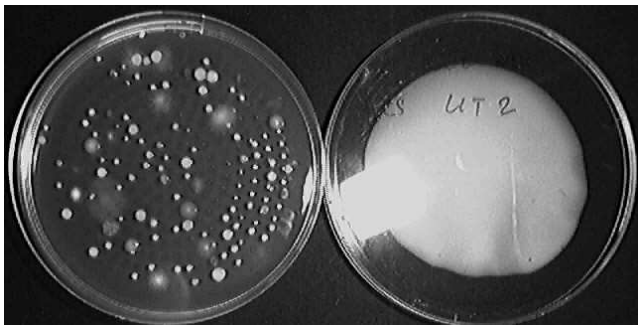
			
Flore aérobie mésophile		**Yeast and mould**	
TCS	75 cfu/m^3	MCA	98 cfu/m^3

Reduction of 36,97% for aerobic mesophiliac flora

Reduction of 12,50% for yeast and mould

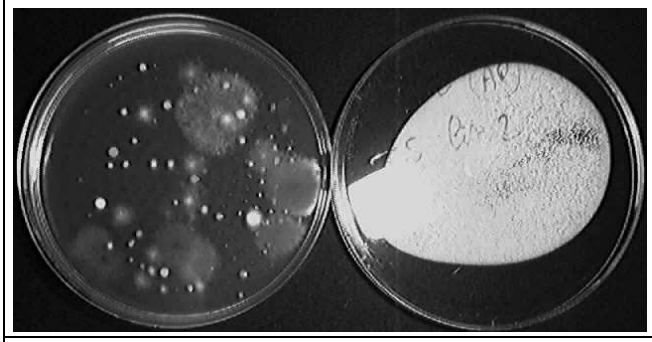
Airborne contamination

Patient ward n°262 Air: **before Biozone** sample 2 above the bed



Aerobic mesophiliac flora		**Yeast and mould**	
TCS	111 cfu/m^3	MCA	102 cfu/m^3

Patient ward n°262 Air : **after** BioZone (2H40mn) sample 2 above the bed

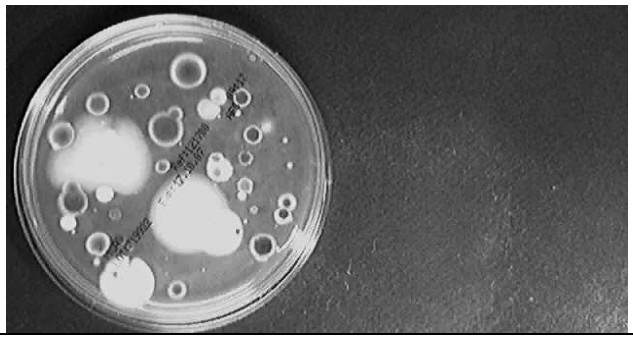


Aerobic mesophiliac flora		**Yeast and mould**	
TCS	77 cfu/m^3	MCA	143 cfu/m^3

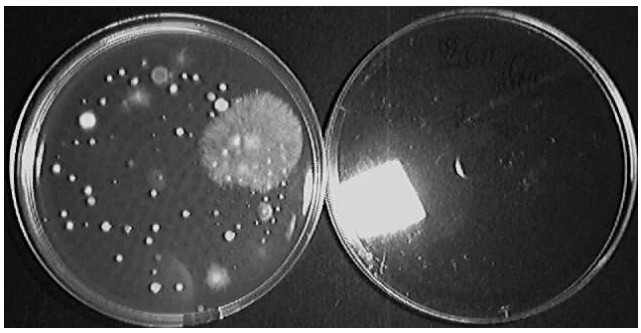
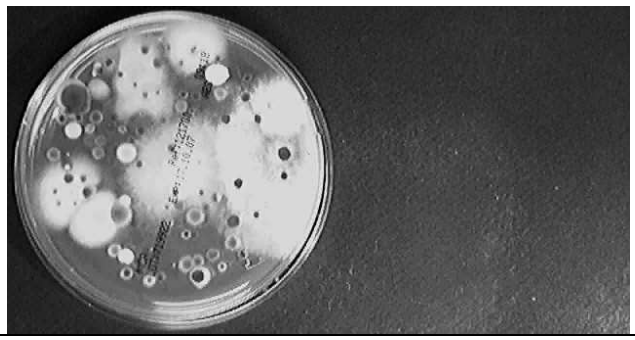
Reduction of 30,63% for aerobic mesophiliac flora

Airborne contamination

Patient ward n°262 Air : **before** BioZone niveau bouche de reprise

			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	80 cfu/m^3	MCA	45 cfu/m^3

Patient ward n°262 Air : **after** BioZone (2H40mn) niveau bouche de reprise

			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	69 cfu/m^3	MCA	84 cfu/m^3

Reduction of 13,75% for aerobic mesophiliac flora

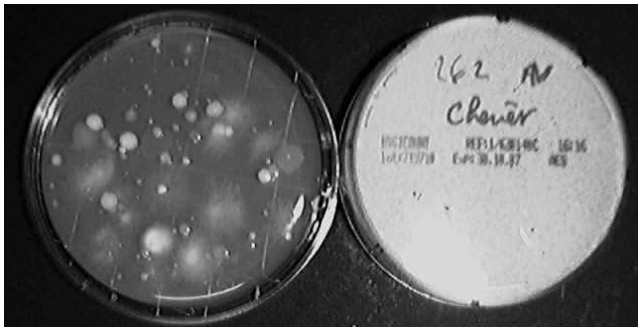
Patient ward n°262 Surface: **before** BioZone washbasin

Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	+++ cfu/23,7 cm²	Sabouraud	25 cfu/m^3

Patient ward n°262 Surface: **after** BioZone (2H40mn) washbasin

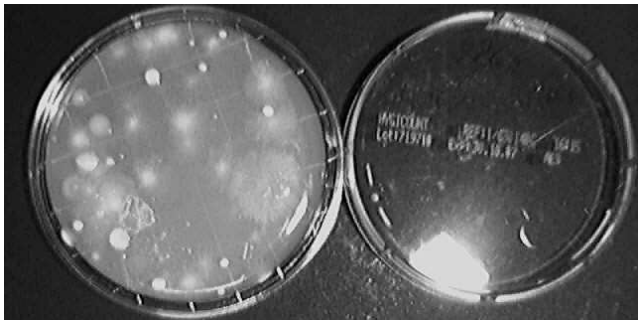
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	14 cfu/23,7 cm²	Sabouraud	23 cfu/m^3

Patient ward n°262 Surface: **before** BioZone bedside table



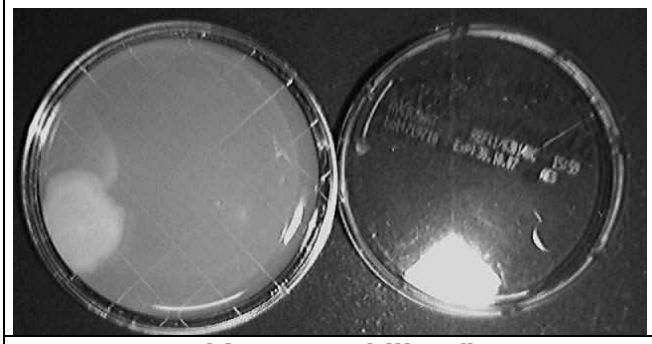
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	+++ cfu/23,7 cm²	Sabouraud	++++ cfu/m^3

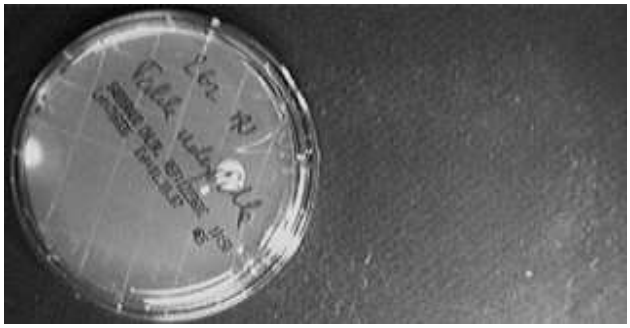
Patient ward n°262 Surface: **after** BioZone (2H40mn) bedside table



Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	++ cfu/23,7 cm²	Sabouraud	24 cfu/m^3

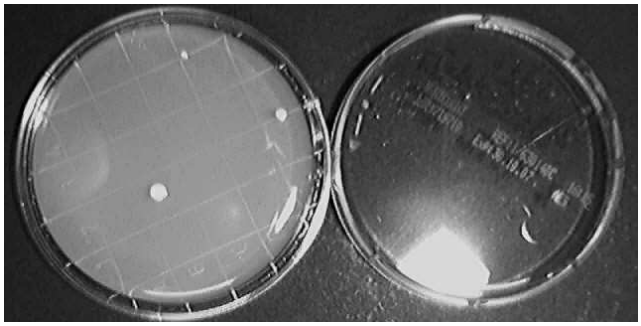
Patient ward n°262 Surface: **before** BioZone Table





Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	2 cfu/23,7 cm²	Sabouraud	3 cfu/m^3

Patient ward n°262 Surface: **after** BioZone (2H40mn) Table

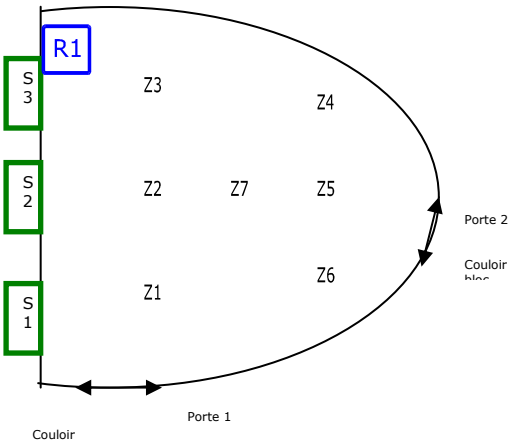


Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	3 cfu/23,7 cm²	Sabouraud	7 cfu/m^3

4-10) operating theatre suite: room n°3

area physical data :

RH %	°C	humidity g/Kg	Dew point °C
57,2	20,9	9,0	12,1



	Zone Volume M3	Blowing flow M3/h	Aspiration flow M3/h	Hourly renewal rate	delta P in pascal	Filter type
bloc 3	**94,8**	**620,0**	**119**	**6,5**	**+ 17**	**Absolute filters : GPA 003**

Measures before BioZone :

	> 0,3 µm	>0,5µm	>1µm	>3µm	>5µm	>10µm
Z1	1116	306	151	56	40	15
Z2	1225	412	229	100	65	30
Z3	1124	382	204	73	53	26
Z4	1568	732	443	167	120	62
Z5	1413	659	384	170	124	60
Z6	1416	682	396	158	103	51
Z7	1987	692	365	140	101	38
Average for 28,3 l	1 407,000	552,143	310,286	123,429	86,571	40,286
Average for 1m³	49 717	19 510	**10 964**	**4 361**	**3 059**	**1 424**
Standard deviation s	306	178	113		34	
LSC at 95 %	49 937	19 638	11 045		3 083	
ISO Category	**6**	**6**	**7**	**na**	**8**	**na**

Zone category : **ISO 6** at 0,5µm

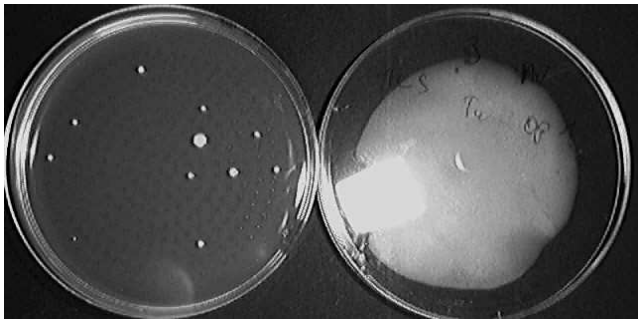
Measure after BioZone :

	> 0,3 µm	>0,5µm	>1µm	>3µm	>5µm	>10µm
Z1	421	100	62	25	20	11
Z2	525	191	113	49	28	23
Z3	866	435	291	150	108	62
Z4	1076	578	369	187	137	78
Z5	936	403	257	128	84	51
Z6	666	331	195	94	77	40
Z7	1137	309	168	79	60	35
Average for 28,3 l	803,857	335,286	207,857	101,714	73,429	42,857
Average for 1m³	28 405	11 848	**7 345**	**3 594**	**2 595**	**1 514**
Standard deviation s	274	158	106		42	
LSC at 95 %	28 601	11 961	7 421		2 625	
ISO Category	**6**	**6**	**6**	**na**	**7**	**na**

Zone category : **ISO 6** at 0,5µm

			>1µm	>3µm	>5µm	>10µm
Reduction percentage	**Theatre 3**	**3xPZ2 : 40'**	**33,01%**	**17,59%**	**15,17%**	**-6,32%**

Theatre n°3 Air: **before** BioZone sample 1 above the operating table



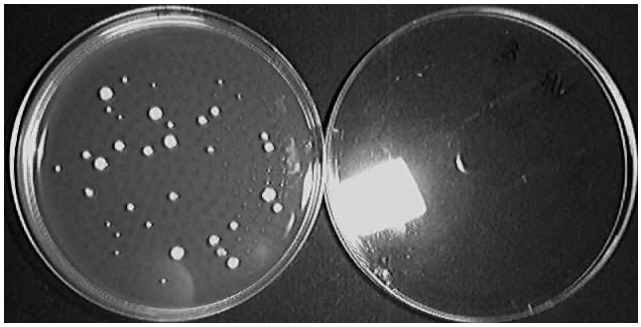
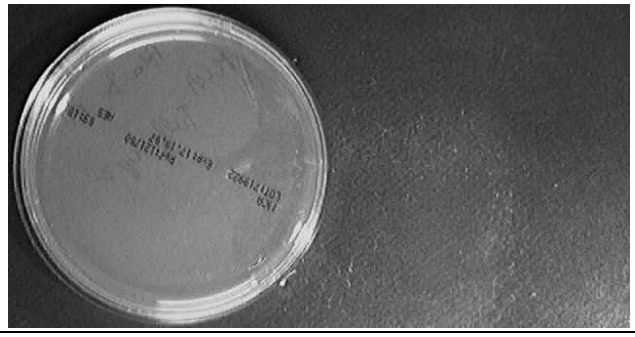
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	11 cfu/m^3	MCA	<1 cfu/m^3

Theatre n°3 Air: **after** BioZone (40mn) sample 1 above the operating table

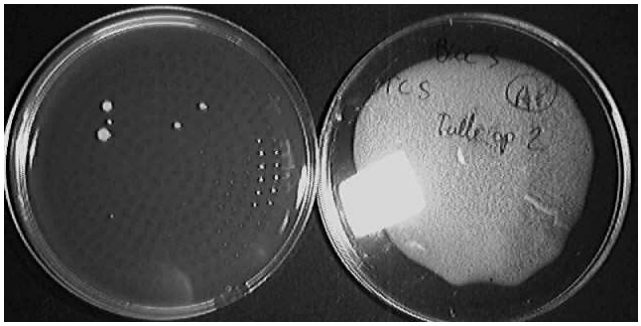
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	4 cfu/m^3	MCA	<1 cfu/m^3

Reduction of 63,64% for aerobic mesophiliac flora

Theatre n°3 Air: **before** BioZone sample 2 above the operating table

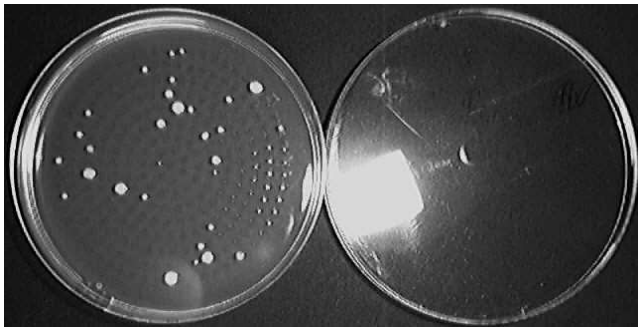
			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	37 cfu/m^3	MCA	<1 cfu/m^3

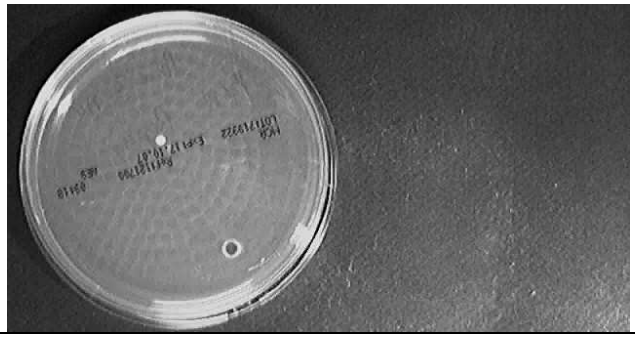
Theatre n°3 Air : **after** BioZone (40mn) sample 2 above the operating table

			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	6 cfu/m^3	MCA	<1 cfu/m^3

Reduction of 83,78% for aerobic mesophiliac flora

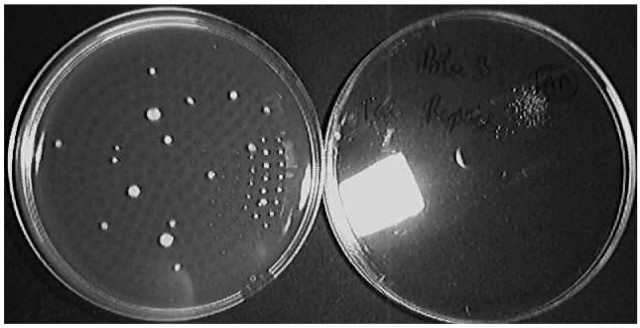
Theatre n°3 Air: **before** BioZone near the return air grill

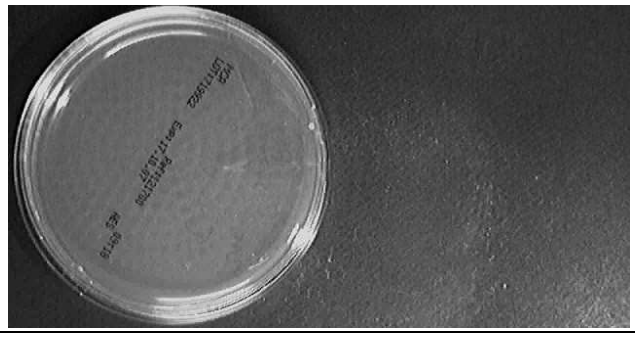




Aerobic mesophiliac flora		**Yeast and mould**	
TCS	30 cfu/m^3	MCA	2 cfu/m^3

Theatre n°3 Air: **after** BioZone (40mn) near the return air grill

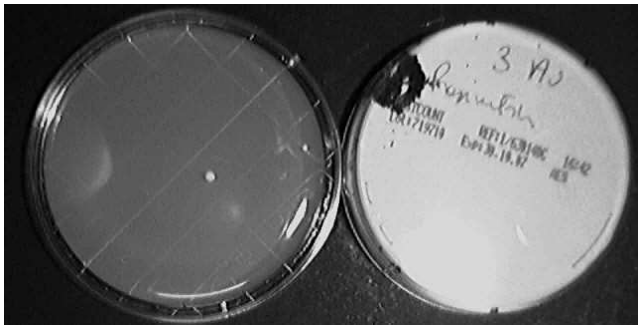
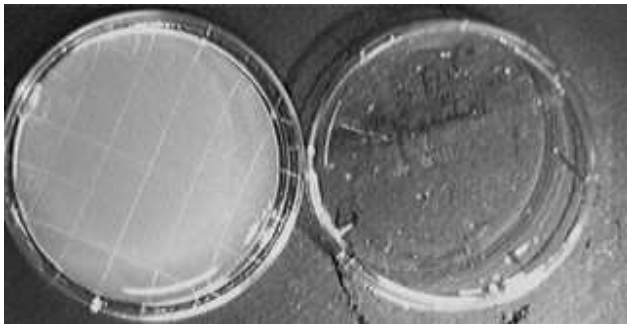




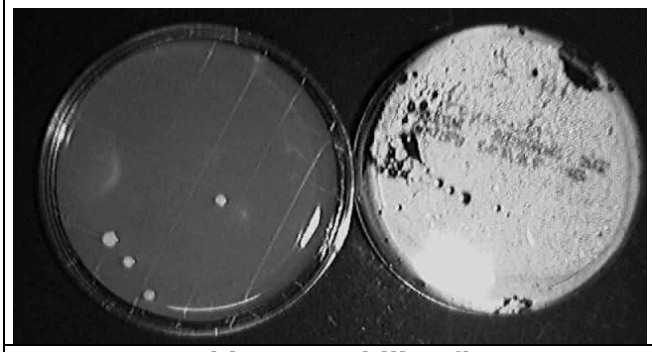
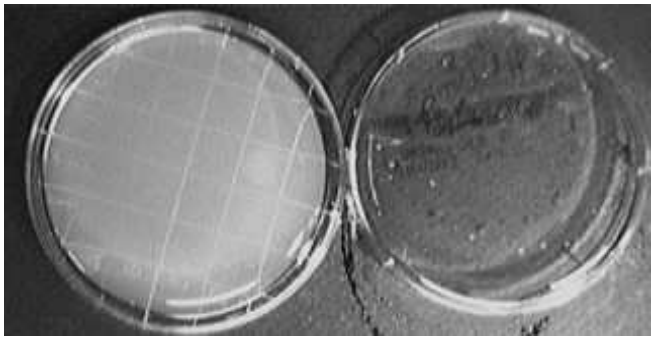
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	18 cfu/m^3	MCA	<1 cfu/m^3

Reduction of 40,00% for aerobic mesophiliac flora

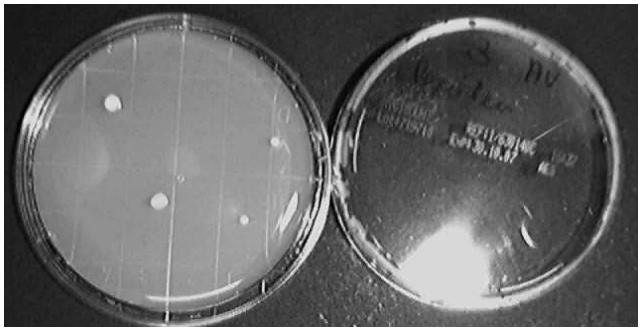
Theatre n°3 Surface: **before** BioZone preparation table

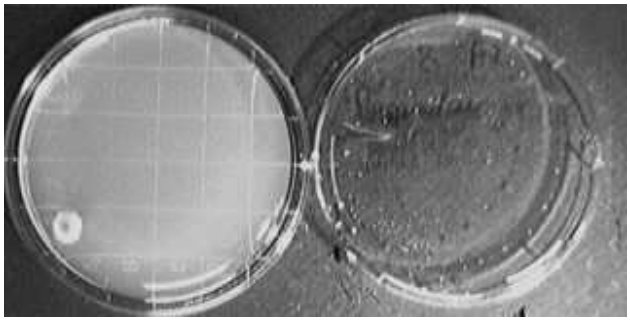
			
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	2 cfu/23,7 cm²	Sabouraud	<1 cfu/m^3

Bloc n°3 Surface: **After** BioZone (40mn) preparation table

			
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	4 cfu/23,7 cm²	Sabouraud	<1 cfu/m^3

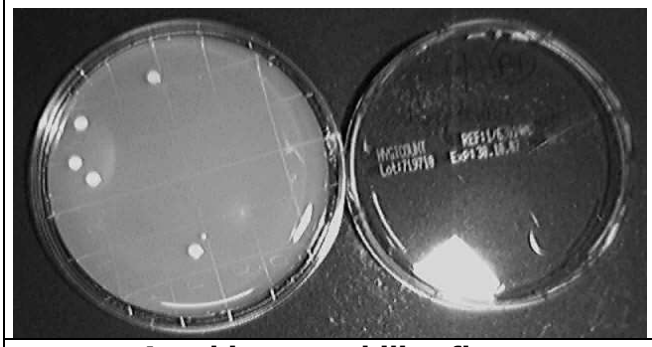
Theatre n°3 Surface: **before** BioZone respirator

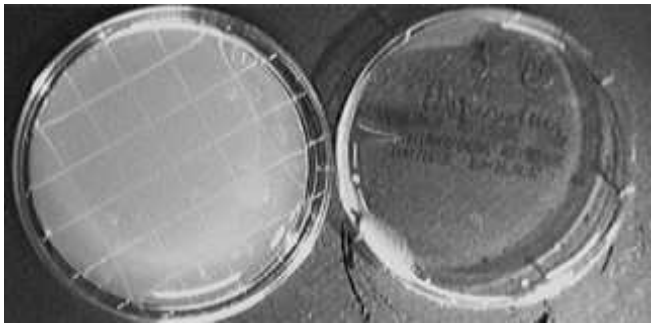




Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	4 cfu/23,7 cm²	Sabouraud	1 cfu/m^3

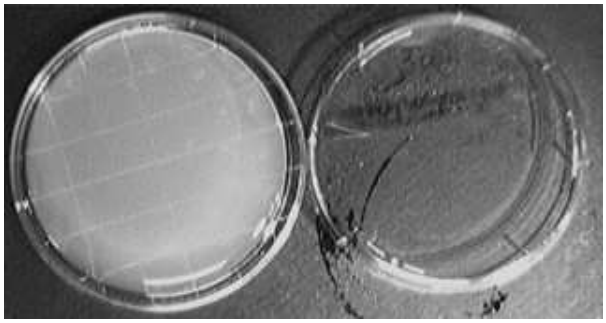
Theatre n°3 Surface: **after** BioZone (40mn) respirator



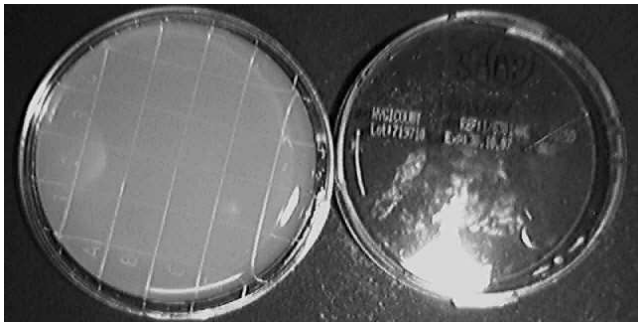
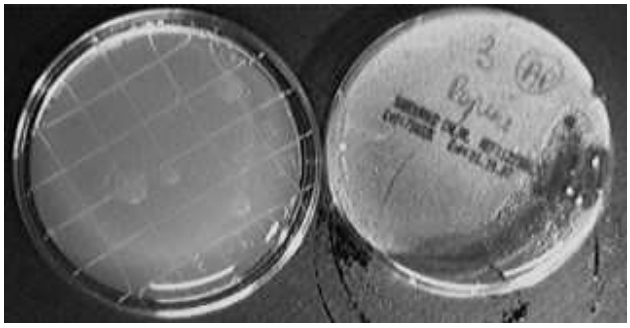


Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	4cfu/23,7 cm²	Sabouraud	<1 cfu/m^3

Theatre n°3 Surface: **before** BioZone return air grill

			
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	3 cfu/23,7 cm²	Sabouraud	<1 cfu/m^3

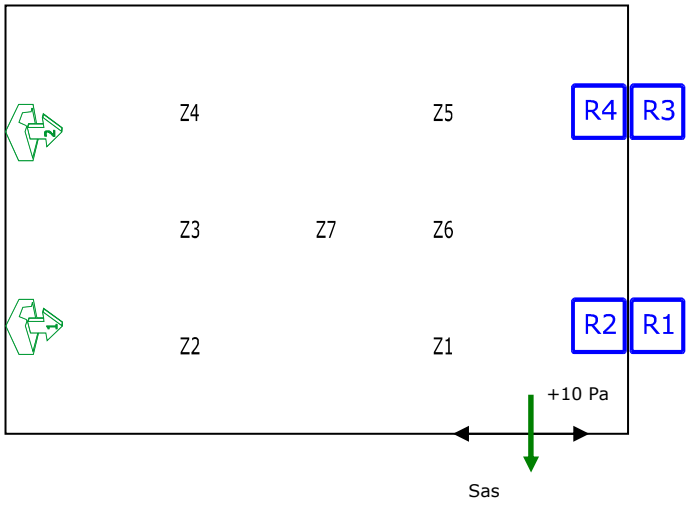
Theatre n°3 Surface: **after** BioZone (40mn) return air grill

			
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	<1 cfu/23,7 cm²	Sabouraud	<1 cfu/m^3

4-11) operating theatre suite: ward n°7

area physical data :

RH %	°C	humidity g/Kg	Dew point °C
53,4	22,1	9,0	12,0



	Zone Volume M3	Blowing flow M3/h	Aspiration flow M3/h	Hourly renewal rate	delta P in pascal	Filter type
Bloc 7	**65,9**	**2 105**	**1 448**	**31,9**	**+ 10**	**Absolute filters : GPA 003 filter : 500 - 6/665 - 8 prefilters : Electrostatique PRP 3**

Measures before BioZone :

	> 0,3 µm	>0,5µm	>1µm	>3µm	>5µm	>10µm
Z1	1436	264	142	60	44	24
Z2	1969	261	117	52	40	29
Z3	1714	302	156	67	54	32
Z4	1204	203	119	48	36	19
Z5	881	144	86	36	28	10
Z6	925	205	124	55	39	20
Z7	898	187	111	56	41	20
Average for 28,3 l	1 289,571	223,714	122,143	53,429	40,286	22,000
Average for 1m³	45 568	7 905	**4 316**	**1 888**	**1 424**	**777**
Standard deviation s	433	54	22		8	
LSC at 95 %	45 879	7 944	4 332		1 429	
ISO Category	**6**	**6**	**6**	**na**	**7**	**na**

Zone category: **ISO 6** at 0,5µm

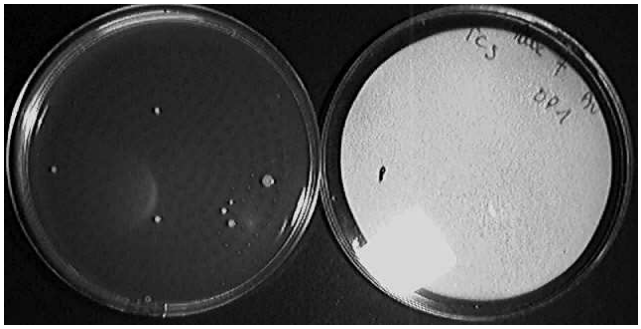
Measures before BioZone :

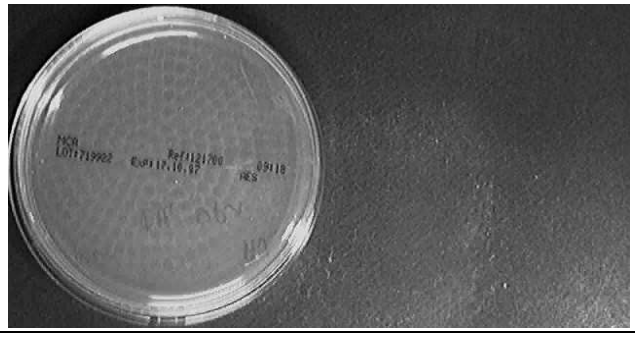
	> 0,3 µm	>0,5µm	>1µm	>3µm	>5µm	>10µm
Z1	994	181	93	49	37	18
Z2	1070	261	145	59	52	22
Z3	1291	376	236	107	77	37
Z4	1014	257	154	72	53	30
Z5	894	237	146	77	57	35
Z6	868	204	116	54	37	19
Z7	1035	174	90	36	23	11
Average for 28,3 l	1 023,714	241,429	140,000	64,857	48,000	24,571
Average for 1m³	36 174	8 531	**4 947**	**2 292**	**1 696**	**868**
Standard deviation s	139	69	50		17	
LSC at 95 %	36 273	8 580	4 983		1 709	
ISO Category	**6**	**6**	**6**	**na**	**7**	**na**

Zone category: **ISO 6** at 0,5µm

			>1µm	>3µm	>5µm	>10µm
Reduction percentage	**Bloc 7**	**3xPZ2 : 40'**	**-14,62%**	**-21,40%**	**-19,10%**	**-11,71%**

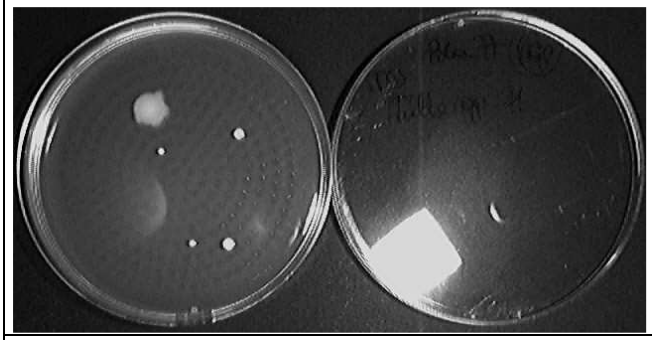
Theatre n°7 Air: **before** BioZone sample 1 above the operating table





Aerobic mesophiliac flora		**Yeast and mould**	
TCS	8 cfu/m^3	MCA	<1 cfu/m^3

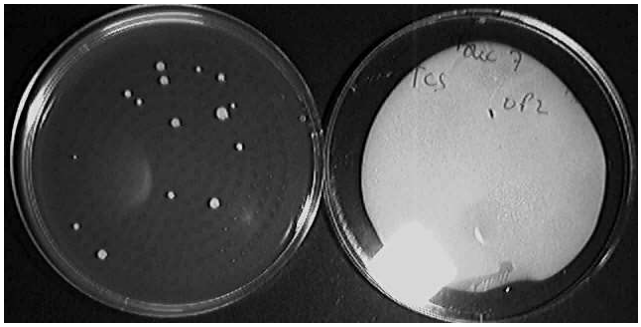
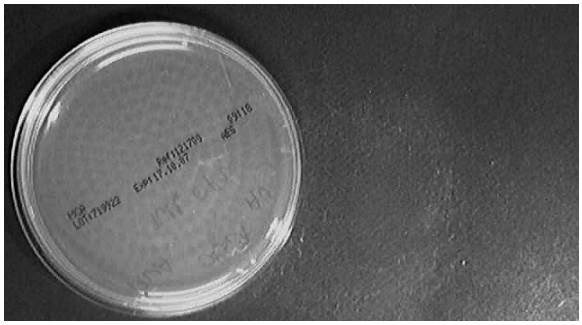
Theatre n°7 Air: **after** BioZone (40mn) sample 1 above the operating table



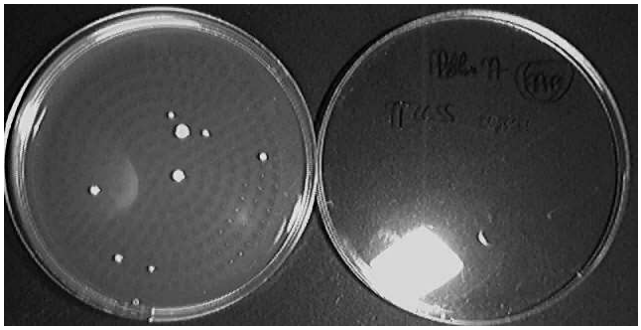
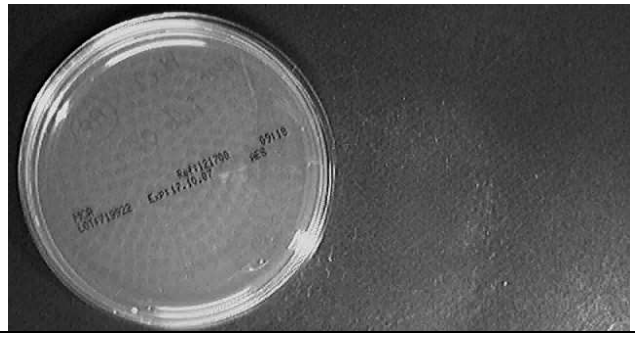
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	5 cfu/m^3	MCA	<1 cfu/m^3

Reduction of 37,50% for aerobic mesophiliac flora

Bloc n°7 Air: **Before** BioZone sample 2 above the operating table

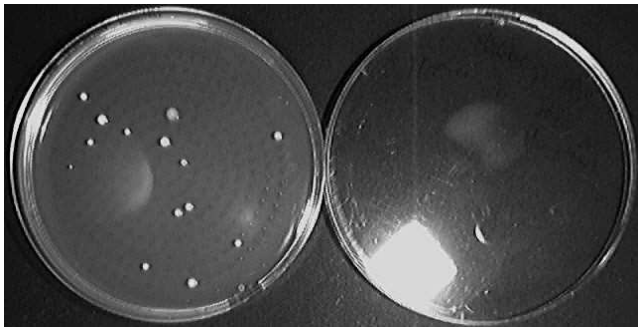
			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	15 cfu/m^3	MCA	<1 cfu/m^3

Theatre n°7 Air: **After** BioZone (40mn) sample 2 above the table

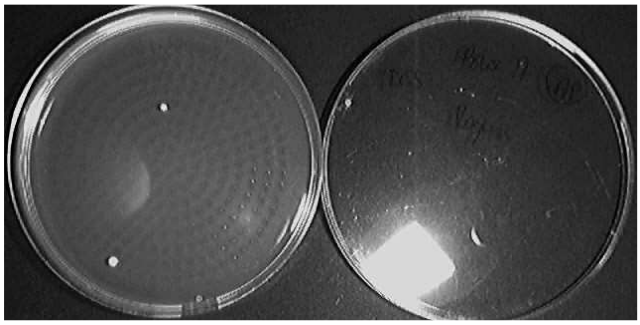
			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	8 cfu/m^3	MCA	<1 cfu/m^3

Reduction of 46,67% aerobic mesophiliac flora

Theatre n°7 Air: **Before** BioZone near the return air grill

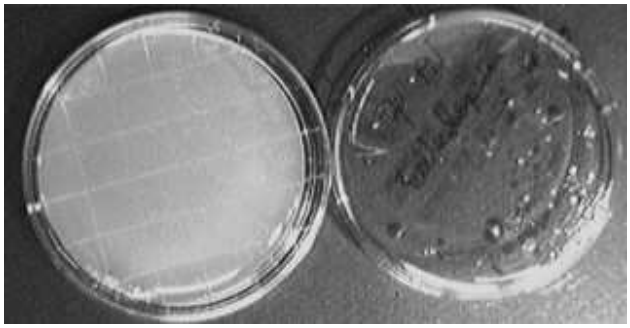
			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	14 cfu/m^3	MCA	1 cfu/m^3

Theatre n°7 Air: **After** BioZone (40mn) near the return air grill

			
Aerobic mesophiliac flora		**Yeast and mould**	
TCS	2 cfu/m^3	MCA	<1 cfu/m^3

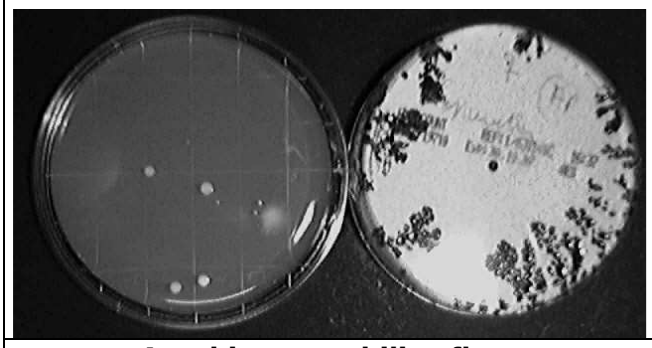
Reduction of 85,71% aerobic mesophiliac flora

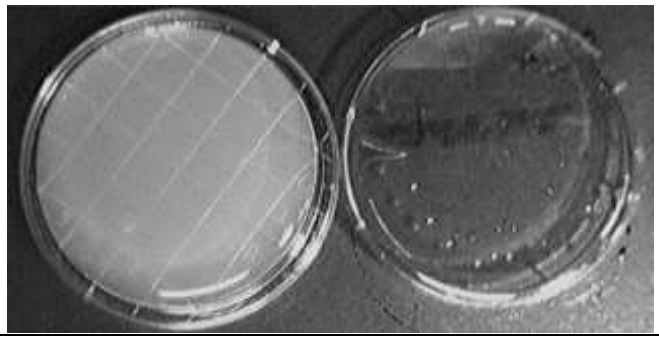
Theatre n°7 Surface: **Before** BioZone preparation table



Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	3 cfu/23,7 cm²	Sabouraud	<1 cfu/m^3

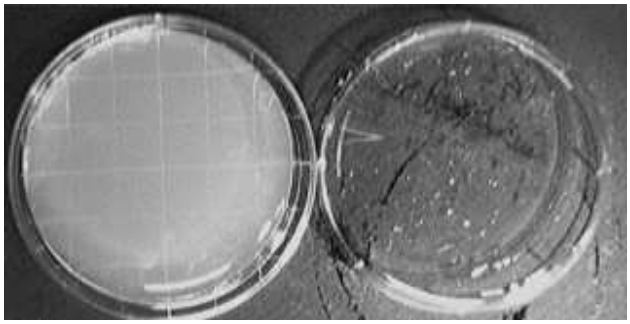
Theatre n°7 Surface: **After** BioZone (40mn) preparation table





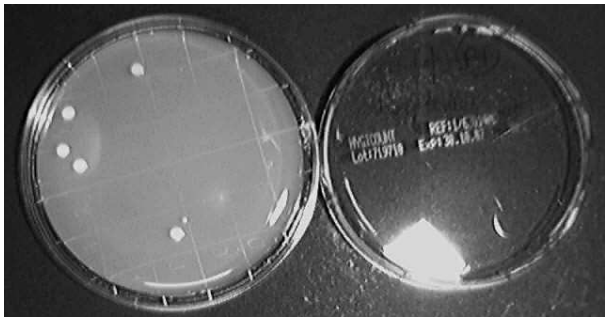
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	8 cfu/23,7 cm²	Sabouraud	<1 cfu/m^3

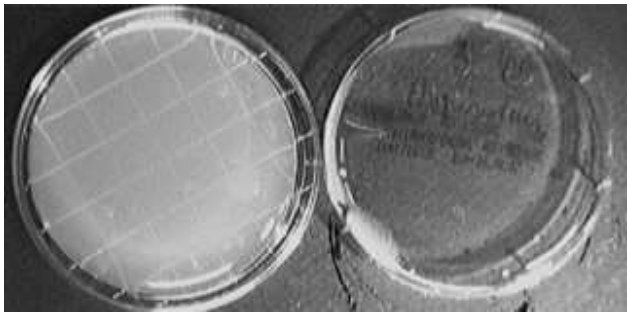
Theatre n°7 Surface: **Before** BioZone Respirator



Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	2 cfu/23,7 cm²	Sabouraud	<1 cfu/m^3

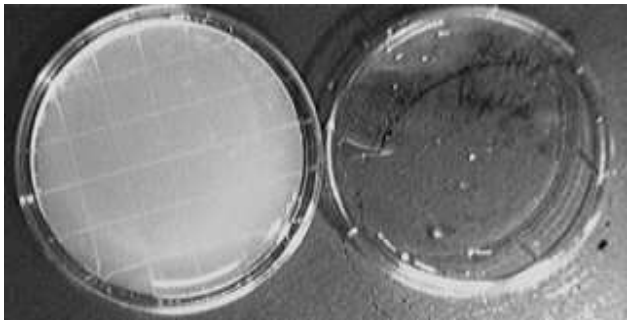
Theatre n°7 Surface: **After** BioZone (40mn) Respirator



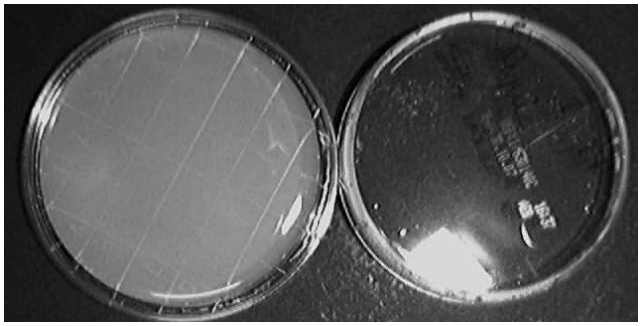
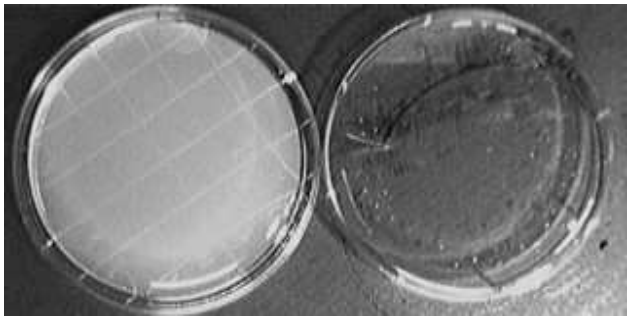


Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	6 cfu/23,7 cm²	Sabouraud	<1 cfu/m^3

Theatre n°7 Surface: **Before** BioZone return air grill

			
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	4 cfu/23,7 cm²	Sabouraud	<1 cfu/m^3

Theatre n°7 Surface: **After** BioZone (40mn) return air grill

			
Aerobic mesophiliac flora		**Yeast and mould**	
Hygicount	<1 cfu/23,7 cm²	Sabouraud	<1 cfu/m^3

5) Particle sample chart

			>1µm	>3µm	>5µm	>10µm
Average for 1m^3	Room 155 Before Biozone		813 067	61 435	19 894	3 300
Average for 1m^3	Room 155 after biozone	PZ2 : 1H50	325 216	28 890	11 230	2 163
Reduction percentage	room 155	PZ2 : 1H50	60,00%	52,97%	43,55%	34,45%
Average for 1m^3	Surgery ward before Biozone		494 806	41 590	14 099	2 247
Average for 1m^3	Surgery ward after Biozone	Aircare(i): 4H30	106 834	11 802	5 859	1 611
Reduction percentage	Surgery ward	Aircare(i) : 4H30	78,41%	71,62%	58,44%	28,30%
Average for 1m^3	Endoscopy 1 Before Biozone		170 148	28 721	13 216	3 152
Average for 1m^3	Endoscopy 1 after Biozone	PZ2 : 3H	145 527	15 979	5 724	968
Reduction percentage	Endoscopy 1	PZ2 : 3H	14,47%	44,36%	56,69%	69,29%
Average for 1m^3	Room 262 Before Biozone		450 777	52 459	20 488	4 346
Average for 1m^3	Room 262 after Biozone	Aircare : 2H40	319 802	30 947	12 806	4 163
Reduction percentage	Room 262	Aircare : 2H40	29,06%	41,01%	37,50%	4,21%
Average for 1m^3	Theatre 3 Before Biozone		10 964	4 361	3 059	1 424
Average for 1m^3	Theatre 3 after Biozone	3xPZ2 : 40'	7 345	3 594	2 595	1 514
Reduction percentage	Theatre 3	3xPZ2 : 40'	33,01%	17,59%	15,17%	-6,32%
Average for 1m^3	Theatre 7 Before Biozone		4 316	1 888	1 424	777
Average for 1m^3	theatre 7 after Biozone	3xPZ2 : 40'	4 947	2 292	1 696	868
	theatre 7	3xPZ2 : 40'	-14,62%	-21,40%	-19,10%	-11,71%

Conclusion :
In all the dusty rooms a significant reduction of particles bigger than 1µm, 3µm, 5µm and 10µm was measured. These particles are responsible for airborne contaminations.

6) Airborne contamination chart

	Reference	medium	Cfu/m³ before	Cfu/m³ after	% reduction	Decontamination time
room 155	PLV 1	TCS	146	44	**69,86%**	PZ2 : 1H50
		MCA	170	49	**71,18%**	
	PLV 2	TCS	107	38	**64,49%**	
		MCA	176	53	**69,89%**	
	Reprise	TCS	105	56	**46,67%**	
		MCA	146	50	**65,75%**	
Small surgery	PLV 1	TCS	166	45	**72,89%**	Aircare : 4H30
		MCA	40	43	**-7,50%**	
	PLV 2	TCS	125	27	**78,40%**	
		MCA	34	35	**-2,94%**	
	Reprise	TCS	70	31	**55,71%**	
		MCA	32	32	**0,00%**	
Endoscopy 1	PLV 1	TCS	58	46	**20,69%**	PZ2 : 3H
		MCA	86	117	**-36,05%**	
	PLV 2	TCS	44	37	**15,91%**	
		MCA	59	92	**-55,93%**	
	Reprise	TCS	219	62	**71,69%**	
		MCA	61	95	**-55,74%**	
room 262	PLV 1	TCS	119	75	**36,97%**	Aircare : 2H40
		MCA	112	98	**12,50%**	
	PLV 2	TCS	111	77	**30,63%**	
		MCA	102	143	**-40,20%**	
	Reprise	TCS	80	69	**13,75%**	
		MCA	45	84	**-86,67%**	
theatre n°3	PLV 1	TCS	11	4	**63,64%**	3xPZ2 : 40minutes
		MCA	<1	<1		
	PLV 2	TCS	37	6	**83,78%**	
		MCA	<1	<1		
	Reprise	TCS	30	18	**40,00%**	
		MCA	2	<1		
theatre n°7	PLV 1	TCS	8	5	**37,50%**	3xPZ2 : 40minutes
		MCA	<1	<1		
	PLV 2	TCS	15	8	**46,67%**	
		MCA	<1	<1		
	Reprise	TCS	14	2	**85,71%**	
		MCA	1	<1		

MCA : yeast and mould
TCS : total flora

occupation : 0 out of human presence
1 one person…etc

7) surface sample chart

Surface samples :

	reference	Date	occupation	medium	Cfu/23,7 cm² Before	Cfu/23,7 cm² after
Room 155	Washbasin	02/08/07	1	Hyg	++++	++++
				Sab	++++	++++
	instrument tray	02/08/07	1	Hyg	++++	5
				Sab	++++	3
	block aspiration	02/08/07	1	Hyg	2	4
				Sab	2	6
Small surgery	Instrument table	02/08/07	1	Hyg	12	46
				Sab	15	11
	Table	02/08/07	1	Hyg	++	++
				Sab	<1	10
	Negatoscope	02/08/07	1	Hyg	++	1
				Sab	2	<1
Endoscopy 1	Instrument table	02/08/07	1	Hyg	25	17
				Sab	13	8
	Negatoscope	02/08/07	1	Hyg	1	1
				Sab	4	1
	block aspiration	02/08/07	1	Hyg	1	<1
				Sab	2	1
Room 262	Washbasin	02/08/07	1	Hyg	+++	14
				Sab	25	23
	Bedside table	02/08/07	1	Hyg	+++	++
				Sab	++++	24
	Table	02/08/07	1	Hyg	2	3
				Sab	3	7
theatre n°3	Respirator	02/08/07	1	Hyg	4	4
				Sab	1	<1
	Preparation	02/08/07	1	Hyg	2	4
				Sab	<1	<1
	block aspiration	02/08/07	1	Hyg	3	<1
				Sab	<1	<1
theatre n°7	Respirator	02/08/07	1	Hyg	2	6
				Sab	<1	<1
	Preparation	02/08/07	1	Hyg	3	8
				Sab	<1	<1
	block aspiration	02/08/07	1	Hyg	4	<1
				Sab	<1	<1

Hyg = Hygicount, total flora
Sab = Sabouraud, fungus

– measuring instruments certificates

HACH ULTRA
EXCELLENCE IN PROCESS ANALYTICS

MET ONE ANATEL ORBISPHERE HIAC

CERTIFICAT D'ÉTALONNAGE

No : 1070275

DÉLIVRÉ A : CLEAN CONCEPT MESURES
11 RUE DU PROFESSEUR CALMETTE
95240 CORMEILLES EN PARISIS

INSTRUMENT(S) ÉTALONNÉ(S) :

Désignation	Constructeur	Type	No de série
Compteur de particules	Pacific Scientific	A2400	980500146

Date d'étalonnage : 24 Janvier 2007

Date d'émission : 25 Janvier 2007

Ce document comporte 3 pages

Signature du responsable

A.NOEL

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ANATEL HIAC ORBISPHERE HYT METONE POLYMETRON

Certificat d'étalonnage n°EMA0702055228

ETALONNAGE EN TEMPERATURE
TEMPERATURE CALIBRATION

1. Caractéristiques de l'appareil à étalonner :
Features of the instrument to calibrate :

Désignation : Appareil de mesure multifonctions AMI 301 PRO
Designation Thermocouple K

Echelle : -200,0 à +1300 °C
Range

Résolution : 0,1 °C de -200,0 à +999,9 °C et 1 °C au delà.
Resolution

Exactitude : ± 0.5 % x mesure ± 0,8 °C
Accuracy

2. Méthode d'étalonnage :
Calibrating principles :

Les points d'étalonnage sont réalisés par simulation de sonde avec un mesureur calibreur AOIP CALYS 10 SN R002865-013, controlé par un multimètre de précision KEITHLEY type 2010 n°: 1100773, raccordement COFRAC n°39185/2007.
L'appareil de mesure a été ajusté par rapport à une référence de tension fournie par un calibreur AOIP CALYS 10 SN R002865-013, controlé par un multimètre de précision KEITHLEY type 2010 n°: 1100773, raccordement COFRAC n°39185/2007.

Points of calibration are realized by simulation of probe, with an AOIP CALYS 10 calibrator SN R002865-013, controlled by accurate multimeter KEITHLEY type 2010, n°: 1100773, traceable by COFRAC n°39185/2007.
The measuring device has been adjusted, according to a voltage reference, supplied by a AOIP CALYS 10 calibrator SN R002865-013,controlled by accurate multimeter KEITHLEY type 2010, n°: 1100773, traceable by COFRAC n°39185/2007.

3. Conditions d'environnement :
Environmental conditions :

Température ambiante : 19,0 °C ± 2 °C
Ambiant temperature

Hygrométrie relative : 55,0 %HR ± 5 % HR
Relative humidity

Pression atmosphérique : 1005 hPa
Atmospheric pressure

4. Résultats des mesures :
Measurement results :

Tableau des valeurs
Values Panel
Voie n° 1 / Channel n° 1
Thermocouple K

N°	Vref	Vi	Vi-Vref	Inc. (*)
Unit.	(°C)	(°C)	(°C)	(°C)
1	-150,0	-149,9	0,100	0,17
2	0,0	0,0	0,000	0,16
3	200,0	199,8	-0,200	0,16
4	500,0	500,2	0,200	0,18
5	1100,0	1100,0	0,000	0,34

Etalonnage effectué par M. Berteau Laurent le 25/04/2007
Calibrated by

Certificat d'étalonnage n°EMA0702055228

ETALONNAGE EN HYGROMETRIE
HYGROMETRY CALIBRATION

1. Caractéristiques de l'appareil à étalonner :
Features of the instrument to calibrate :

Désignation : *Designation* — Appareil de mesure multifonctions AMI 301 PRO
avec sonde d'humidité à capteur capacitif et capteur de température intégré. Sonde n° 07044372
with capacitive sensor humidity probe and integrated temperature sensor. Probe n° 07044372

Echelle : 3,0 à 98,0 % HR et -20,0 à +80,0 °C
Range

Résolution : 0,1 % HR et 0,1 °C
Resolution

Exactitude : ± 1 % x mesure ± 1,5 % HR et ± 2 % x mesure ± 0,1 °C
Accuracy

2. Méthode d'étalonnage :
Calibrating principles :

Hygrométrie : Les points d'étalonnage sont réalisés dans des solutions salines saturées mises en place suivant les recommandations de la norme Afnor NFX15-014, et régulièrement contrôlées avec un thermo-hygromètre étalon et un hygromètre à condensation à miroir refroidi type Dewmet TDH, SN110026. Raccordement BNM-COFRAC n° H 07 1568 0G.
Température : contrôle par comparaison avec un thermo-hygromètre étalon.
L'appareil de mesure a été ajusté par rapport à une référence de tension fournie par un calibreur AOIP CALYS 10 SN R002865-013, controlé par un multimètre de précision KEITHLEY type 2010 n°: 1100773, raccordement COFRAC n°39185/2007.

Hygrometry : The points of calibration are realized in saturated saline solutions put in position as per Afnor NF X15-014 french norms recommendations and regularly checked with a standard thermo-hygrometer and with a cooled mirror dewpointmeter type TDH SN110026,traceable by BNM-COFRAC n° H 07 1568 0G.
Temperature : checked with a standard thermo-hygrometer.
The measuring device has been adjusted, according to a voltage reference, supplied by a AOIP CALYS 10 calibrator SN R002865-013, controlled by accurate multimeter KEITHLEY type 2010, n°: 1100773, traceable by COFRAC n°39185/2007.

3. Conditions d'environnement :
Environmental conditions :

Température ambiante : 20,0 °C ± 2 °C
Ambiant temperature

Hygrométrie relative : 56,0 %HR ± 5 % HR
Relative humidity

Pression atmosphérique : 1017 hPa
Atmospheric pressure

4. Résultats des mesures :
Measurement results :

Tableau des valeurs
Values Panel

N°	Vref	Vi	Vi-Vref	Inc. (*)
Unit.	(% HR)	(% HR)	(% HR)	(% HR)
1	9,0	8,7	-0,300	0,98
2	56,0	56,3	0,300	1,04
3	75,0	74,9	-0,100	1,3

Contrôle en Température Temperature check	
Vref °C	Vi °C
20	19,8

Etalonnage effectué par M. Danjou Guillaume le 24/04/2007
Calibrated by