SF2H
Risque infectieux et soin

Differences and similarities in Infection prevention in European countries

EUNETIPS | European network to promote infection prevention for patient safety

Berlin, 26 June 2015

# Air supply in operating theatres – the French view


Pierre Parneix

pierre.parneix@chu-bordeaux.fr

@peyo3319


www.sf2h.net

# Conflict of interest



BORDEAUX - Hôpital Saint-André
Salle des Opérations M. D.


BORDEAUX — Hospice et Hôpitaux Pellegrin
Pavillon Tastet-Girard. Salle d'Opérations



http://www.architecture-hospitaliere.fr/wp-content/uploads/2013/05/AH7-Maquet.pdf


http://www.architecture-hospitaliere.fr/wp-content/uploads/2013/05/AH7-Maquet.pdf

# French new guidelines – June 2015


# French new guidelines – June 2015


## Recommendation 0 (no rating)

**It is highly recommended to analyze a priori risk for the development of an air treatment.**

## Recommendation 15

**It is recommended to analyze a priori risk (eg using a AMDEC or 5M type of method) to identify possible underlying causes of non-conformities of environmental controls performed and the possible corrective measures.**

**Grade B3. Total agreement (p25:9; p50:9)**

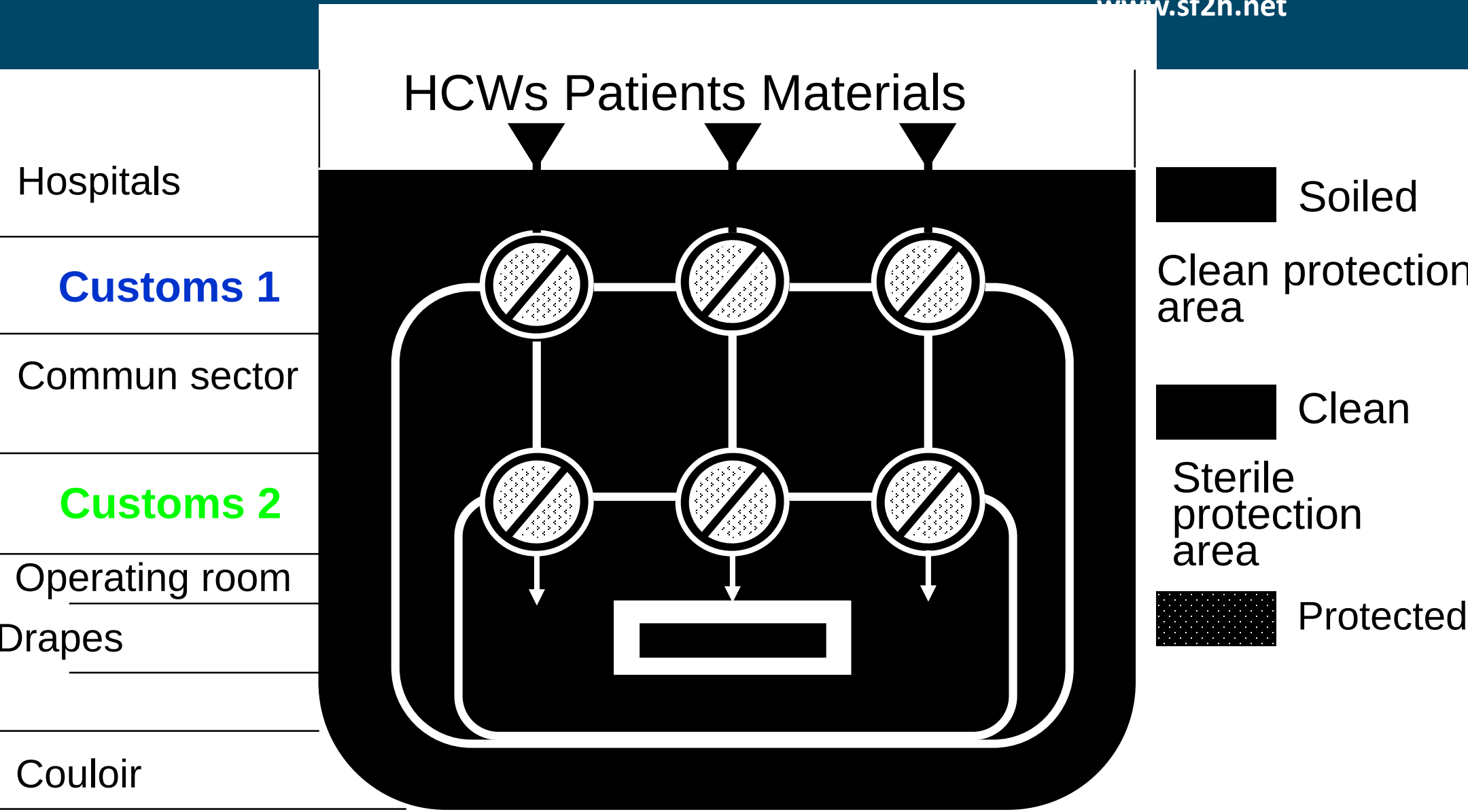
# A very light regulation

- No specific air treatment mandatory required:
  - Old regulation about building designed to received visitors,
  - Out of date regulation about volatile anaesthetic gas,
  - Decree of 7 January 1993 about outpatient surgery:

# A very light regulation

## Decree of 7 January 1993 about outpatient surgery

- The operating area includes a protected operating area. This area warrants through technical devices, work organization and a specific and adapted hygiene, minimizing the risks to the patient, the surgical team, third parties and the environment, and has the appropriate means to face their consequences. These risks include anesthetic and infectious ones or those related to physical agents used.
- All operative sector and any protected operating area must be physically demarcated and indicated.






**Progressive asepsis. Thierry Hoet 1985**

# A strong French standard – April 2013

ISSN 0335-3931

norme française

**NF S 90-351**

**6 Avril 2013**

Indice de classement : **S 90-351**

**ICS : 11.080.01**

## Établissements de santé — Zones à environnement maîtrisé — Exigences relatives à la maîtrise de la contamination aéroportée

E : Health care institutions — Controlled environment areas — Requirements for airborne contamination control

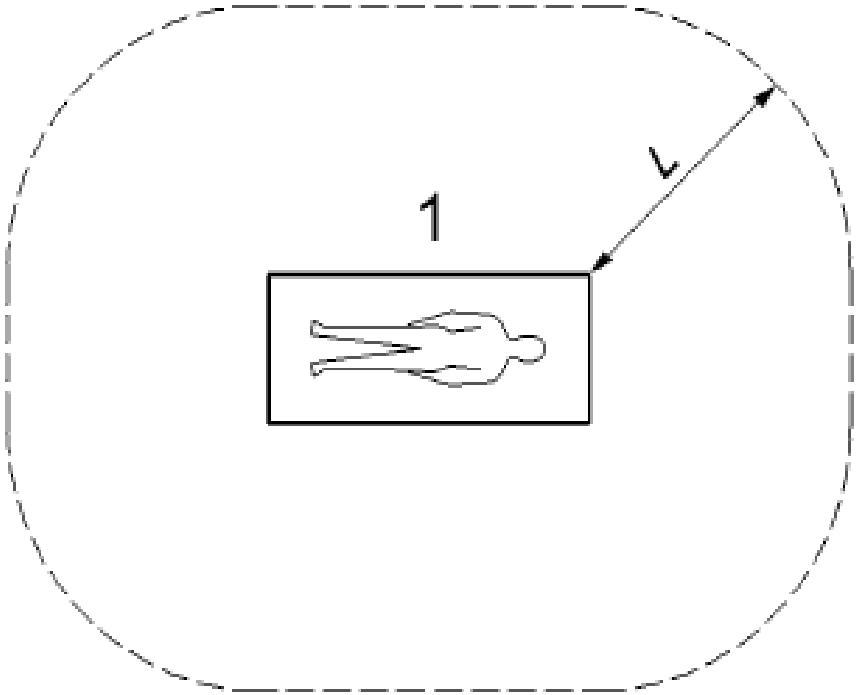
D : Einrichtungen des Gesundheitswesens — Zones aus kontrolliertem Bereich — Anforderungen an die Lenkung von luftgetragener Kontamination

S *Norme française homologuée*

# French standard – April 2013

| | | |
|---|---|---|
| M | ABDELAZIZ | IHF — INGENIEURS HOSPITALIERS DE France – CHU de Toulouse |
| DR | ADJIDÉ | SF2H — SOC FSE D HYGIENE HOSPITALIERE |
| DR | AHO | SF2H — SOC FSE D HYGIENE HOSPITALIERE |
| MME | ALLOUL-MARMOR | ASPEC |
| M | BARTOLUCCI | CHU DE ROUEN |
| M | BIDAR | MINISTERE DES AFFAIRES SOCIALES ET DE LA SANTE – DGOS — DG DE L'OFFRE DE SOINS |
| M | BRUNO | AIR SUR |
| DR | CAUSSE | CTRE HOSPITALIER INTERCOMMUNAL CRETEIL |
| M | COLOMBIE | ARCHITECTES INGENIEURS ASSOCIES |
| DR | FRANCO | AH-HP — HOPITAL ANTOINE BECLERE |

# French standard – April 2013




**Protected patient environment – L : 0.5 t0 2.5 meters**

# French standard – April 2013

| ISO | 0,1 µm | 0,2 µm | 0,3 µm | 0,5 µm | 1 µm | 5 µm |
|---|---|---|---|---|---|---|
| Classe ISO 5 | 100 000 | 23 700 | 10 200 | 3 520 | 832 | 29 |
| Classe ISO 6 | 1 000 000 | 237 000 | 102 000 | 35 200 | 8 320 | 293 |
| Classe ISO 7 | | | | 352 000 | 83 200 | 2 930 |
| Classe ISO 8 | | | | 3 520 000 | 832 000 | 29 300 |

# French standard – April 2013

| Risk class | Particulate Cleanliness class | Particulate Removal kinetics | Microbiological cleanliness class |
|---|---|---|---|
| 4 Prosthetic ortopedia and burns surgery | ISO 5 | CP 5 | M1 |
| 3 Other surgery | ISO 7 | CP 10 | M10 |
| 2 OR corridor | ISO 8 | CP 20 | M100 |

# French new guidelines – June 2015


## Recommendation 1

**It is recommended to establish an air treatment with unidirectional flow for prosthetic orthopedic surgery to reduce aerobiocontamination. This is in addition to antibiotic prophylaxis which plays an essential role in the prevention of infection for this type of surgery.**

**Grade B1. Strong agreement (p25:7; p50:9)**

## Recommendation 2

**It is highly recommended to set up an air treatment in a versatile operating room. According to the standard NF 90-351 in force, air treatment achieves particulate contamination class at least equivalent to ISO 7**

**Grade A3. Full agreement (p25: 9; p50: 9)**

# French new guidelines – June 2015


## Recommendation 11

**It is strongly recommended to establish a particulate ambient air control (immediate results, standardized method, better reproducibility) whenever an air control system aims to obtain a controlled environment in the operating room and interventional sector.**

**Grade A2. Total agreement (p25:9; p50:9)**

## Recommendation 12

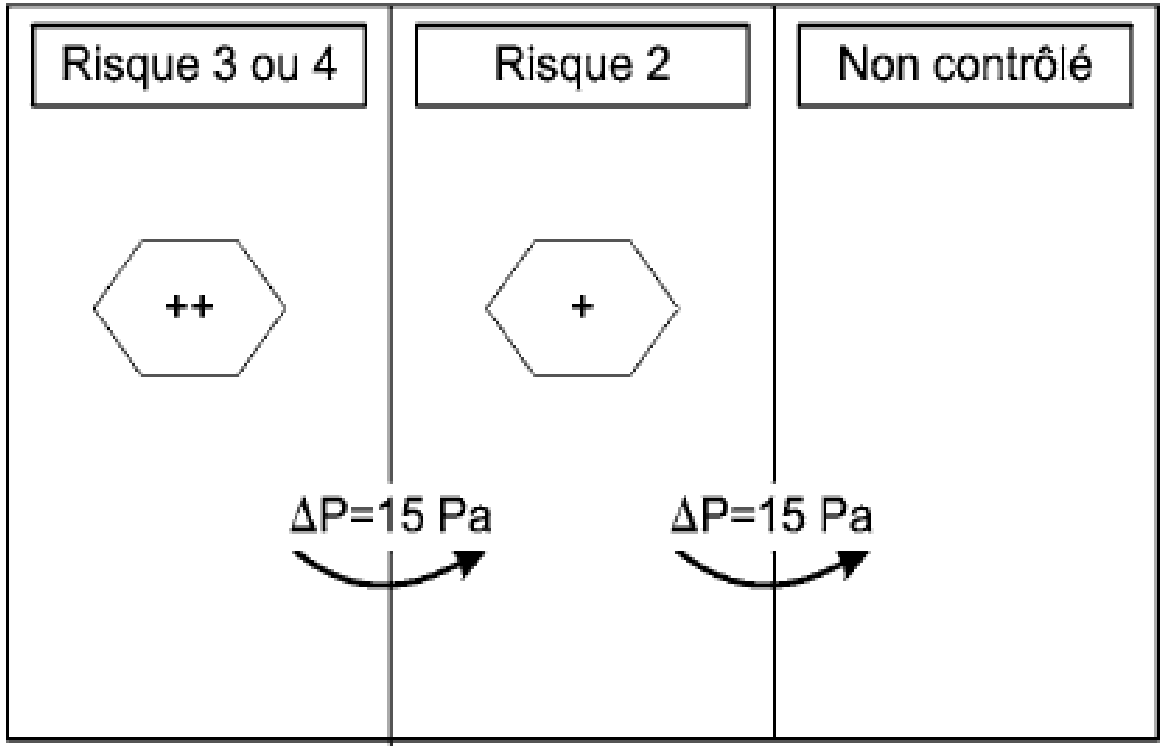
**It is recommended not to do routine microbiological controls air whatever delivery method (unidirectional flow or not unidirectional flow) of air control system.**

**Grade D3. Strong agreement (p25: 7; p50: 9)**

# French standard – April 2013

| Risk class | Particulate cleanliness class | Differential pressure (positive or negative) | Temperature Range | Air flow regime of the protected area | Other specifications, minimum value |
|---|---|---|---|---|---|
| 4 | ISO 5 | 15 Pa ± 5 Pa | 19 ° C to 26 ° C | Unidirectional flow | Area under the flux Air velocity of 0.25 m/s to 0.35 m/s Fresh air rate of the room, not less than 6 volumes / hour |
| 3 | ISO 7 | 15 Pa ± 5 Pa | 19 ° C to 26 ° C | Unidirectional or non-unidirectional flow | Air mixing rate greater than or equal to 15 volumes / hour |
| 2 | ISO 8 | 15 Pa ± 5 Pa | 19 ° C to 26 ° C | Non-unidirectional flow | Air mixing rate greater than or equal to 10 volumes / hour |

# French standard – April 2013




**Pressure waterfall**

# French new guidelines – June 2015


## Recommendation 8

**It is recommended that the pressure cascade provides a gradient of 15 ± 5 Pa.**

**Grade B 3. Total Agreement (p25: 9; p50: 9)**

## Recommendation 17

**It is recommended for each room boasting an air quality control system, to provide users at least the following witnesses of good works: pressure and temperature.**

**Grade B 3. Total Agreement (p25: 9; p50: 9)**

# French new guidelines – June 2015


**Recommendation 21**

**It is recommended to monitor and trace the opening day of the room, the displayed parameters such as pressure and temperature. It is recommended to have a written procedure on the measures to be implemented in case of non-conformities.**

**Grade B3. Total agreement (p25:9; p50:9)**

# Centre hospitalier intercommunal de Cornouaille

**Bloc médico-chirurgical 541 lits**
**Quimper (29)**

- Hébergement
- Logistique
- Plateau technique
- Urgences SAMU

**Restructuration-extension hôpital type Fontenoy**

**Hébergement**

- 251 lits médecine / chirurgie
- 18 lits néonatologie
- 12 lits néphrologie
- 15 lits dialyse
- 20 lits chirurgie ambulatoire

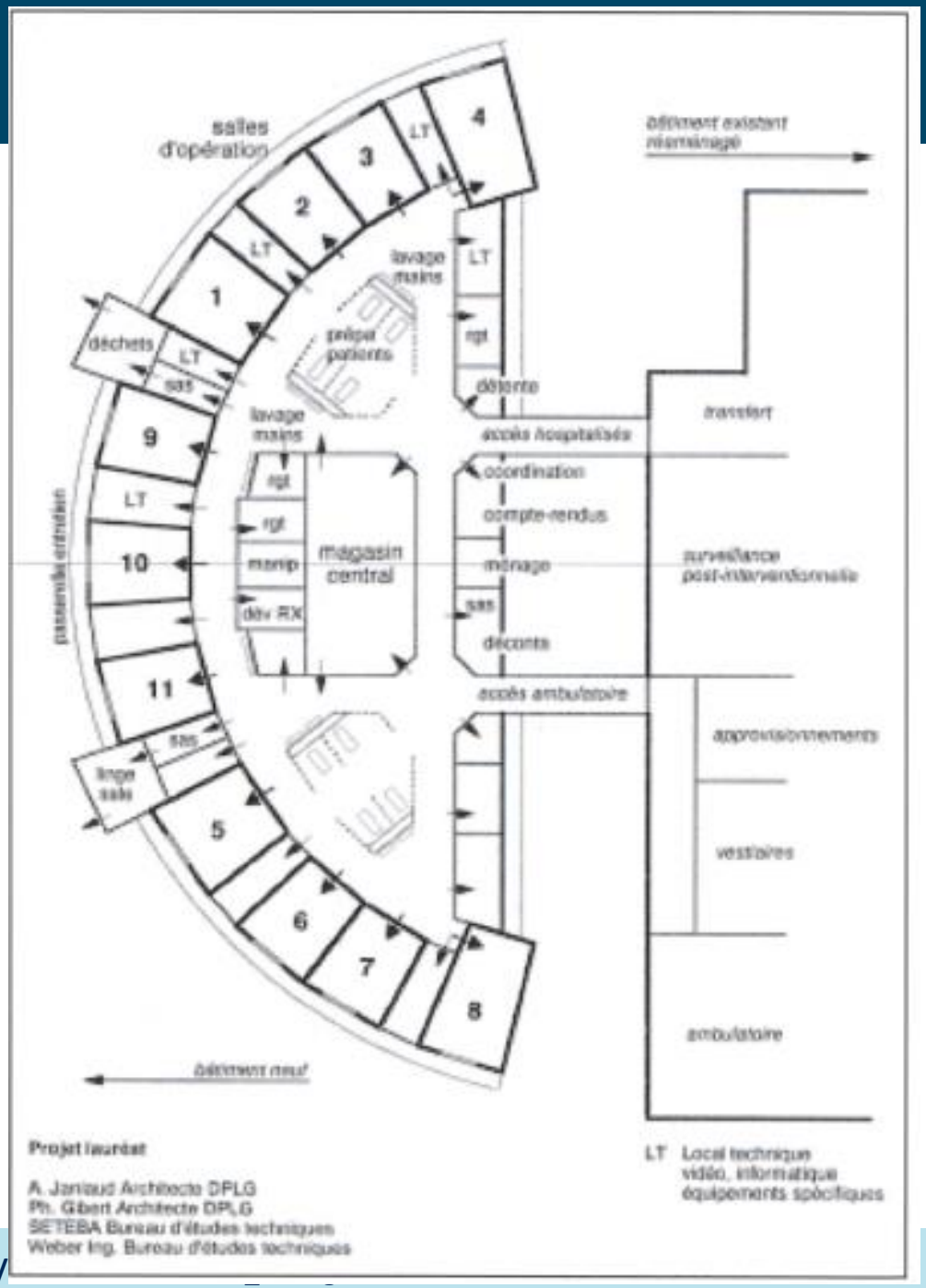
**Plateau technique**

- Bloc opératoire 12 salles
- bloc obstétrical
- Stérilisation centrale
- Cardiologie
- Urgences pédiatriques
- Consultations
- Pharmacie
- Explorations fonctionnelles

**Logistique**

- Cuisine centrale
- restaurant du personnel

http://3sdarchitectes.fr/realisation/centre-hospitalier-intercommunal-de-cornouaille/


salles d'opération
bâtiment existant réaménagé
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11
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déchets
sas
lavage mains
prépa patients
magasin central
rgt
manip
dév RX
déconts
accès hospitalisés
accès ambulatoire
coordination
compte-rendus
ménage
transfert
surveillance post-interventionnelle
approvisionnements
vestiaires
ambulatoire
bâtiment neuf
Projet lauréat
A. Jarlaud Architecte DPLG
Ph. Gibert Architecte DPLG
SETEBA Bureau d'études techniques
Weber Ing. Bureau d'études techniques
LT Local technique vidéo, informatique équipements spécifiques

# Air in theatres



http://www.architecture-hospitaliere.fr/blog/2014/03/21/e-bloc-lalliance-entre-larchitecture-et-les-technologies-biomedicales/

# Air in theatres


## ❷ le plafond ventilo-diffusant CamHosp-R


## Ⓐ Flux d'air traité

| | | |
|---|---|---|
| Valeurs typiques | 0,25 m/s | 0,32 m/s |
| Air neuf traité | 2 000 - 2 400 m³/h | 2 000-2 400 m³/h |
| Air recyclé | 6 100 - 5 700 m³/h | 8 400 - 8 000 m³/h |
| Total sous flux | 8 100 m³/h | 10 400 m³/h |

# The new madness: The hybrid room

# Conclusion

- Air control in operating theatres in France:
  - No real change in scientific evidences,
  - No data to modify strategy for minimally invasive surgery,
  - Low regulation, strong standard,
  - Wide professional consensus,
  - Improved design and conception quality!
- Some remaining questions:
  - How many rooms to equip with ISO 5 level?
  - What is the room left for non-unidirectional flow?

# NA 041-02-53 AA

## Function rooms (Mirror committee CEN/TC 156/WG 18)

The Working Committee NA 041-02-53 AA "Function rooms (Mirror committee CEN/TC 156/WG 18)" of Heating and Ventilation Technology Standards Committee (NHRS) in DIN deals with standards and standardization projects related to design, construction, acceptance and periodic inspection of ventilation systems in function rooms. These include among others all health service buildings and rooms, which must be supplied with ventilation and air conditioning due to infection hygiene or occupational health, as well as to rooms directly connected to those rooms by doors, corridors/hallways, etc. such as in: - Hospitals; - Clinics; - Nursing homes, - Engaging rooms in doctors' surgeries; - Ambulant surgery centers / facilities; - Dialysis centers; - Facilities for internal and external (service) units for the reprocessing of medical devices (formerly central sterilization "). In the European standardization NA 041-02-53 AA acts as mirror committee to CEN/TC 156/WG 18 "Ventilation in hospitals".

**Standards of the Committee** | **Projects of the Committee**

## Mirrored Committees of NA 041-02-53 AA

| Committee ID | Name |
|---|---|
| CEN/TC 156/WG 18<br>Secretariat : NEN | Ventilation in hospitals |



Contact

**Dipl.-Ing.**
**Rainer Schmidt**

**Send message**