Air quality
For healthcare environment

Contamination control, healthcare safety
**Air contamination:**

a major risk for the patient

Air contamination is due to the presence of microorganisms and aerosolized particles that can carry them. Among these, *Aspergillus spp* is responsible of invasive aspergillosis, associated most of the time with the potentially life-threatening condition for immunocompromised patients. Incidence varies from 4 to 26% for bone marrow transplant or acute leukemia patients with a mortality rate from 74 to 92%. Immunocompetent patients with deep surgery (cardiac surgery), burns and ICU patients should be considered at risk also. MERS-Cov, MSRA, multi resistant *Mycobacterium tuberculosis* are also in the scope of the clinicians due to high pathogenicity and difficult costly treatment.

**Air quality:**

a key element to prevent the risk of infection

Air treatment units can reduce particles load when they have high quality filtration efficiency. Some of them can also reduce microbiological and chemical contamination whilst others can destroy the microorganisms trapped in the filters. In addition to efficiency, level of noise and ease of use are also important features to take into account. For example WHO state that for nighttime use the noise levels in rooms should not exceed 40DbA.

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### Air quality in hospitals: a standard regulated area

**ISO 14 644-1 standard:** define class cleanliness of the room.

**NF S90-351 French standard:** define class of risk according to the activity. Each class of risk is associated to a class of particle cleanliness, a particle decontamination kinetic and a microbiological class.

<table>
<thead>
<tr>
<th>Activities</th>
<th>Class of risk</th>
<th>Particle class</th>
<th>Particle decontamination kinetic</th>
<th>Microbiological class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burnt patients, Protected environment in hematology, Drug preparation, Parenteral nutrition preparation, Operating rooms *</td>
<td>4</td>
<td>ISO 5</td>
<td>CP 5</td>
<td>M1 for <em>Aspergillus spp.</em></td>
</tr>
<tr>
<td>Hematology, Transplants, Post graft patients, Interventional imaging, In-vitro fertilization, Operating rooms *</td>
<td>3</td>
<td>ISO 7</td>
<td>CP 10</td>
<td>M10</td>
</tr>
</tbody>
</table>

*Depending on surgery profile.

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### How to choose an air treatment unit?

- Lowest noise.
- Technology adapted to the nature of the elements to eliminate.
- No release of toxic substances.
- High flow rate adaptable to room volume and standard.
- Intuitive controls.
- Mobile.
- Easy to maintain.
- Performance validated by independent and published studies.
A unique concept, a tailored product

Create a high-level isolation area within a standard room

- Modular concept perfectly suited to room configuration: size, arrangement, options.
- Integrated air treatment with a connected PLASMAIR™ unit.
- Assembly in 3 days.
- The ideal solution for 2 different situations:
  - Airborne Protective Isolation Room (APIR),
  - Airborne Infectious Isolation Room (AIIR).

Modular isolation area to contain the spread of infections or protect “at risk” patients.

- Tailored size and space to suit any room layout.
- Assembly in 3 days.
- Cleanroom walls.
- Automatic sliding door with controlled leak rate.
- Optional decorated ceiling.
- Friendly user interface.

Assembly in 3 days.

Adjustment and control through large touch screen.

Please contact us at any time so that we can provide the optimal specification for your particular need.
Protective environment mobile or fixed

Deployable plenum to protect immunocompromised patients

Patients under chemotherapy to treat malignancy in hematology and oncology, and in particular those who have received cell transplant, undergo a phase of aplasia (neutropenia < 500/mm³) and deep immunosuppression. Severe and potentially lethal infection is the major risk for those patients. In this context, providing optimal air quality is a mandatory prevention measure as stated in international recommendations and Good Practices guidelines.

Protective environment for immune-compromised patients in transplant units, hematology and oncology.

- Connected to a PLASMAIR™ unit treating air continuously: Performance ISO 5.
- Removable and transparent curtains.
- Minimal and low cost maintenance.
- Comfortable patient area.
- Light servicing.
- Easy access to the patient for medical staff.
- 2 variants: Fixed or mobile units.
- Optional flat TV screen.

TO ORDER

<table>
<thead>
<tr>
<th>Part code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>CP12000</td>
<td>Fixed IMMUNAIR™</td>
</tr>
<tr>
<td>CP07000</td>
<td>Mobile IMMUNAIR™</td>
</tr>
<tr>
<td>CP12101</td>
<td>Flat screen TV</td>
</tr>
</tbody>
</table>
HEPA-MD™ TECHNOLOGY: the reference in hematology and transplant units

Principle of HEPA-MD™ technology:
a 4 stages reactor

- Destroys micro-organisms.
- Filters particles with very high efficiency.
- Eliminates oxidant chemical molecules.
- Adsorbs Volatile Organic Compounds.

Destroy microorganisms with cold plasma

Micro-organisms trapped in module 2 are directly and continuously exposed to ions and oxidizing compounds generated by the upstream plasma module. This activity in the collection media is called post corona discharge, and is used in particular for surface sterilization ($H_2O_2$).

So, if organic material is not fully inactivated while passing through the plasma stage, it will be destroyed by oxidation in the collection media. Thus, no microorganism can survive in the reactor HEPA-MD™. This feature allows the PLASMAIR™ to eliminate one of the major risks of mechanical filters, which can allow bacteria and fungi, under some conditions, to grow and eventually release viable contaminants.

Advantages of HEPA-MD™ technology

- Improve mechanical filtration efficiency with the addition of electrostatic effect.
- Burns microorganisms through oxidation.
- Reduces particle load in the room.
- No accumulation of viable microbiology in HEPA filters.
- No release of toxic compounds.
- Reduces unpleasant odours.

Coanda effect

This airflow pattern enables a continuous and optimized mixing of the room’s air volume.

HEPA-MD™ technology has been evaluated by international recognized laboratories.
PLASMAIR™

Guardian

High capacity, efficient, silent.

- Very fast particle and microorganism reduction kinetic.
- High flow rate (2500 m³/h).
- Fungi < 1 UFC/m³.
- Reduce from ISO 9 to ISO 7/ISO 6 in a few minutes.
- Very quiet.
- 2 preset ventilation regimes (day/night) with automatic programmable change.
- Continuous recording of in-use parameters with large data storage.
- Large touch screen 4.3”.

PLASMAIR™

Sentinel

Compact for small room.

- A combination of HEPA-MD™ technology.
- Very efficient with better than HEPA performance.
- Small footprint (less than 0.32 m²).
- Highly mobile, easy to move on dual castors.
- Ideal for small room up to 50 m³.

PLASMAIR™

C2010

Air decontamination ceiling unit.

- Embedded HEPA-MD™ technology.
- Ceiling mounted - no footprint at all.
- Optional integral fluorescent lighting.
- Remote control.
- Low profile.
- Very quiet.

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<tr>
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<tbody>
<tr>
<td>CP21000</td>
<td>PLASMAIR™ Guardian</td>
</tr>
<tr>
<td>CP11000</td>
<td>PLASMAIR™ Sentinel</td>
</tr>
<tr>
<td>CP09001</td>
<td>PLASMAIR™ C2010 with light</td>
</tr>
</tbody>
</table>

Decontamination of a 35m² room from ISO9 to ISO7 in 10 min, 24 air changes per hour (ACH).
High efficiency filtration unit

HEPA Guardian and HEPA Sentinel

With very high filtration efficiencies, the HEPA range of products is the best choice to protect medium risk patients and general ward applications. Very fast particle removal due to high flow rate (up to 2500 m³/h) combined with low noise levels to ensure comfort.

High capacity and fast particle removal.

- Mobile.
- Performance: ISO 7.
- Flow rate: up to 2500 m³/h.
- Filtration: from H14 to U15.
- Quiet.

Filtration compact unit.

- Small footprint.
- Easy to move.
- Performance: ISO 7.
- Flow rate: up to 1200 m³/h.
- Filtration: H14.
- Quiet.

Friendly user interface with led technology.

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<tr>
<td>CP14000</td>
<td>HEPA Guardian</td>
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<tr>
<td>CP15000</td>
<td>HEPA Sentinel</td>
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</table>
Removal of oxidizing compounds following a dry fogging disinfection process to shorten vent times.

Removal of acid vapors in endoscope reprocessing units.

Connects remotely to our dry fogging surface disinfection unit RHEA Titan for automated biocide removal in the vent cycle.

- Rapid elimination of acetic and peracetic acid and hydrogen peroxide.
- Shorter vent times after surface disinfection.
- Quick decontamination room.
- Removal of acid vapours in endoscope reprocessing areas.

Example of a complete decontamination cycle in an unventilated room of 50 m$^3$.

Removal of Volatile Organic Compounds (VOC) as formaldehyde in vitro fertilization.

- Quick removal of aldehydes based agents (ex: formaldehydes).

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<tbody>
<tr>
<td>CP16001</td>
<td>eCHEM OX Sentinel</td>
</tr>
<tr>
<td>CP16002</td>
<td>eCHEM VOC Sentinel</td>
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</tbody>
</table>
airinspace™ at your disposal

Audit: our team comes from a background of pharmaceutical and clean room industries. They are experts in air treatment and can help you make a complete analysis of existing installations. They can provide you with efficient, cost effective and simple solutions.

Installation: once machines are delivered, our technical team is available to support technical and medical staff with product installation and startup assistance. We provide Functional Qualification (FQ) on site and fully train end users.

Maintenance and after sale service: maintenance is easy and cost effective. We offer several options and our contracts are valid during the whole life-cycle of the products worldwide.

Guarantee: airinspace™ offers 1 year warranty on parts and labor worldwide (modules and filters not included).

Customer service: a question? A request? Do not hesitate to contact us at +33 1 30 07 01 01 or e-mail us at contact@airinspace.com

We are dedicated to customer satisfaction and ISO9001 certified.