PURE AIR
For a healthier life
Each day, we breathe in 10,000 liters of air – that’s more than 12 kilos! The quality of the air we breathe is thus an important and even vital concern to us all.

We spend about 80% of our time in enclosed spaces. Yet the air we breathe inside our homes, at work, at recreation centers and even at school is more polluted than the air outdoors. Indoor air contains many pollutants, including allergens, particles, chemical substances, microorganisms (viruses, bacteria, etc.) and possibly tobacco smoke. Some of these pollutants come from outdoors, while others are produced directly indoors – by building and finishing materials, furniture, appliances and equipment, cleaning products and room fragrances. Our own behaviors can also impair indoor air quality (poor ventilation, inadequate maintenance of mechanical ventilation, increased humidity, etc.).

Several studies have shown that continuous exposure to these pollutants has negative effects on our health in both the short and the long term. This has also been clearly recognized by health authorities.

Indoor air pollution is a major public health concern that we need to fight on a day-to-day basis. Practical and effective solutions can help each of us improve the quality of the air we breathe indoors. Air purification is not just in vogue, it’s one way we can protect our health.

Dr. Squinazi
Air pollution is now the world’s largest single environmental health risk. The principal pollutants in outside air are particles, or “Particulate Matter” (PM). They are classified by their size in micrometers (PM10, PM2.5, PM1 and PM0.1). Fine particles (PM2.5) are the most harmful, and were classified as known human carcinogens in 2013.

Many countries have high levels of air pollution, with particle concentrations exceeding the limits set by the World Health Organization (WHO). Residents of Asian cities face the worst air pollution.

Contrary to what one might think, the air we breathe inside our homes is, on average, 2 to 8 times more polluted than the air we breathe outdoors. According to a broad-based European study, indoor air contains up to 10 times more volatile organic compounds (VOCs) – chemical pollutants primarily generated by human activities.

Indoor air quality can be impaired by a variety of factors – from polluted outdoor air entering our homes to various sources of indoor pollution.
The impacts of air pollution

Poor air quality can result in physical discomfort (eye irritation, runny nose, skin dryness or dryness, coughing, etc.) or even cause or worsen diseases.

**The high costs of air pollution**

**OUTDOOR AIR**
€233 billion/year
Estimated health costs of outdoor air pollution in the European Union

$71-$277 billion/year
Estimated damages due to emissions of air pollution in the United States

**INDOOR AIR**
€19 billion/year
Estimated socio-economic costs of indoor air pollution in France

Similar studies conducted in other countries (Italy, Netherlands and the United States) reveal similar costs, in the range of several billion euros per year. Data are nonetheless difficult to compare, as the methods used and pollutants taken into account may differ.

**RESPIRATORY ALLERGIES**
4th most important chronic disease in the world
Between 1980 and 2020, the prevalence of allergic diseases doubled in developed countries

25-30% of the world’s population has allergies
17 million people in the U.S. have asthma
3 million people in Japan have asthma
1 of every 6 children under the age of 16 in Australia has asthma

**CANCERS**
17% of premature deaths caused by lung cancer are attributable to poor air quality

**CARDIOVASCULAR DISEASES**
1,400,000 stroke deaths can be linked to poor indoor air quality

**WORLDWIDE ACTION**

Air pollution killed 7 million people in 2012

Number of deaths caused by indoor and outdoor air pollution in 2012, by WHO region (in thousands)

Source: WHO data, 2012

GERMANY

AWARENESS/INFORMATION:
- Development of Indoor Air Quality Technicians: Home improvements for patients with conditions linked to indoor environments (allergies, asthma and chronic respiratory conditions).
- Tip sheets for residents on improving indoor air quality at home (focus on carbon monoxide, benzene, particles, etc.).

LABELING:
- Created in 1978, Germany’s "Blue Angel" ecolabel is awarded on the basis of health and environmental criteria.

CHINA

NATIONAL PROGRAMS:
- September 2013: Five-year plan to reduce levels of fine particles in outdoor air (record highs were reached in January 2013) – 84 measures mainly concerning the use of vehicles and carbon, the two greatest sources of pollution in China.
- Hong Kong, March 2013: A Clean Air Plan for Hong Kong involves measures to reduce pollution emissions from power plants and transportation activities.

ITALY

AWARENESS/INFORMATION:
- The Air Pollution and Respiratory Health Branch: Program to fight against environmental-related respiratory illnesses, including asthma, and studies on indoor and outdoor air pollution.

LABELING:
- Since January 2012, labeling of volatile pollutant emissions levels is required on all construction and finishing materials.

UNITED STATES

AWARENESS/INFORMATION:
- Three "Health and Environment Plans": Measures to monitor, improve and raise awareness about indoor air quality.
- Guidelines for Indoor air quality (VGAI) have been established for 47 pollutants.

LABELING:
- Created in 1978, the "California" ecolabel is awarded on the basis of health and environmental criteria.

UNITED ARAB EMIRATES

NATIONAL PROGRAMS:
- Measures to improve indoor air quality (maintenance of air conditioning systems, low-emitting materials, etc.).

FRANCE

AWARENESS/INFORMATION:
- Annual Clean Air Day.

LABELING:
- Angel” ecolabel is awarded on the basis of health and environmental criteria.

NATIONAL PROGRAMS:
- Development of the role of “Indoor Environment Medical Advisors” (CMEI): Home improvements for patients with conditions linked to indoor environments (allergies, asthma and chronic respiratory conditions).
- Tip sheets for residents on improving indoor air quality at home (focus on carbon monoxide, benzene, particles, etc.).
Indoor air pollutants

The air we breathe in our homes contains a number of pollutants from varied sources. On any given day, our homes have a certain baseline pollution level (“background level”). From time to time, this level increases sharply due to activities such as DIY projects, cooking, cleaning, decorating and furnishing our homes. Pollutants fall into three main categories:

Physical pollutants include dust, particles and fibers. Particles are generally classified by size:
- PM10, or particles with a median aerodynamic diameter under 10 μm*
- PM2.5, or particles with a median aerodynamic diameter under 2.5 μm, known as “fine particles”
- PM0.1, or particles with a median aerodynamic diameter under 0.1μm, known as “ultrafine particles”

Chemical pollutants contribute to background pollution levels:
- Formaldehyde: It irritates the eyes, nose and throat. Formaldehyde may increase the risk of asthma in children and cause more frequent sensitization to respiratory allergens. Since 2004, it has been classified as a known human carcinogen by the International Agency for Research on Cancer (IARC).
  - PM10 & PM2.5
  - VOCs
  - Formaldehyde
  - Carbon monoxide

Biological pollutants:
- Pollens
- Pet allergens
- Mold
- Dust mites
- Bacteria
- Viruses
- Pet & Human hair
- Tobacco smoke
- Carbon monoxide
- Formaldehyde
- Fibers

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Focus on... Fine particles: Fine particles can come from multiple sources. Some are natural (dirt particles blown by the wind), while others are linked to human activity (industry, transportation, heating, etc.). For example, diesel fine particles mainly come from vehicle traffic emissions. Indoors, particle levels depend on various factors such as proximity to highways, cooking, heating systems, smoking, poor ventilation, etc. Particle inhalation can increase respiratory problems and sensitivity to allergens. Particles can also aggravate respiratory diseases such as asthma or chronic obstructive pulmonary disease (COPD).

According to a European study (17), our life expectancy at age 30 would be up to 22 months longer if average annual levels of fine particles were reduced to 10 μg/m³.

Focus on... Formaldehyde: Formaldehyde is a colorless, irritating gas with an acrid odor. It is highly volatile, very water soluble and also unstable. Formaldehyde is a type of volatile organic compound (VOC). Formaldehyde is emitted by many different building and common consumer products, including tobacco smoke, scented candles, press wood (furniture, wood floors, etc.), cleaning and DIY products (paint, glue, varnish,...), insulants, cosmetics, etc.

Focus on... Tobacco smoke: Tobacco smoke contains nicotine and tar that can harm health.

Focus on... Where are they found? Tobacco smoke: They are emitted by faulty combustion equipment, heating equipment, ebacis, wood-burning stoves, response jackets, etc.

Focus on... Where are they found? VOCs: VOCs primarily include formaldehyde, acetaldehyde, acetone, toluene and benzene.

Focus on... Where are they found? In every room of the house: Building materials and insulants: glass wool, mineral wool, etc.

* μm: micrometer
**BIOLOGICAL POLLUTANTS**

**Where are they found?**
- Ventilated living spaces located near gardens, forests or fields.
- Toilets, bathrooms and bedrooms.
- Bathrooms and other poorly ventilated rooms with high humidity.
- Cats, dogs and rodents, along with their living spaces.
- In every room of the house.
- Bedding, sofas, rugs, carpeting and clothing.

**Pollens**
Ventilated living spaces located near gardens, forests or fields.

**Pet allergens**
Cats, dogs and rodents, along with their living spaces.

**Bacteria**
Toilets, bathrooms and bedrooms.

**Viruses**
In every room of the house.

**Mold**
Bathrooms and other poorly ventilated rooms with high humidity.

**Dust mites**
Bedding, sofas, rugs, carpeting and clothing.

**FOCUS ON...**

**Pet allergens:**
Pet allergens are present in the fur, skin, anal glands and saliva of pets, and they stick to clothing, sofas, rugs, carpeting, curtains, etc. They can also become airborne. In Europe, 26% of the population is sensitized to cats. The main allergen produced by the domestic cat (Felis domesticus) is carried by fine particles with a diameter of less than 5 μm. It stays in suspension in the air for a very long time, even after the cat has left the area. In sensitized people, the allergen can cause very irritating allergic reactions, such as chronic rhinitis (runny nose and sneezing), conjunctivitis and asthma.

**Dust mites:**
Dust mites frequently live in bedrooms where they can be found in mattresses, pillows, comforters, etc. They develop in humid surroundings (60-80%) at rather high temperature (26-32°C). They are the world’s most common allergen, causing 75% of respiratory allergies.

**Flu virus (Influenza):**
Seasonal flu is a common, contagious infectious disease. There are three types of seasonal flu viruses: A, B and C. Among many subtypes of influenza A viruses, influenza A(H1N1) and A(H3N2) are currently circulating among humans. The virus generally spreads by droplets when an infected person coughs or sneezes. At the global level, flu epidemics result in about 3 to 5 million cases of severe illness, and about 250,000 to 500,000 deaths.

**Legionella bacteria:**
Legionella bacteria tends to form in warm water (25°C-45°C). In homes, it is frequently found in hot water systems, but also in cold water systems, air conditioning systems, humidifiers, etc. The bacteria can be ingested when sprayed through an aerosol, causing two types of respiratory illnesses. One is benign (Pontiac fever, 95% of cases) and usually produces flu-like symptoms. The other is serious (Legionnaires’ disease, 5% of cases) and often results in a severe lung infection. The death rate is within the range of 5%-10%.

**CHEMICAL POLLUTANTS**

Present in the form of gas, these pollutants can be introduced via the respiratory system into the bloodstream, and thus reach the body’s different organs.
SOLUTIONS
For better indoor air quality

Rowenta’s commitment

We spend 80% of our time indoors, and breathe in nearly 10,000 liters of air each day. Yet, on average, indoor air is two to eight times more polluted than the air outdoors.

At Rowenta, bringing wellness and comfort to our clients has been a priority for many years. As home comfort specialists, we are proud to present our new line of Intense Pure Air air purifiers. Air treatment is essential for a healthy home, and this line rounds out our offering.

TIPS
FOR FIGHTING INDOOR AIR POLLUTION

Taking a few simple steps can help you breathe easy every day.

1. MINIMIZE sources of pollution
   - Choose building and finishing products with low levels of VOCs.
   - Limit the use of aerosol cleaning products, which can release particles or chemical substances.
   - Clean surfaces regularly with a damp cloth.
   - Use a vacuum cleaner equipped with a HEPA filter.
   - Wash bedding regularly, and use dust mite covers on mattresses and pillows (if you’re allergic).
   - Don’t smoke indoors.
   - Avoid houseplants that can cause allergies (such as Ficus benjamina).
   - Avoid using scented candles and other room sprays.

2. AIR INDOOR spaces
   - Air out rooms at least 10 minutes a day, year-round.
   - Make sure they receive adequate ventilation (check that mechanical ventilation systems are in good working order).

3. USE a filter-based air purifier
   Filter-based air purifiers, unlike other types of purifiers (which use photocatalytic oxidation or electric fields) do not produce toxic byproducts.

4. USE a humidifier or dehumidifier
   Choose a device equipped with a hygrometer to maintain optimal humidity levels.

Advice from Dr. Squinazi

INTENSE AQUA CONTROL
Air Humidifier

INTENSE DRY CONTROL
Air Deshumidifier

INTENSE PURE AIR
Air Purifier

By treating indoor air, these devices help combat indoor air pollution, especially for those who are most sensitive to indoor pollutants (babies, older people and people with allergies or asthma).
ROWENTA® Air Purifier range

INTENSE PURE AIR

UP TO 99.97% POLLUTION FILTERED THANKS TO 4 LEVELS OF FILTRATION
(For more details see pages 14-17)
The purifier is equipped with 4 filters adapted to each type of pollutant:
• Pre-filter
• Activated carbon Filter
• HEPA Filter
• NanoCaptur® Filter

The purifier is equipped with two sensors:
• An infrared sensor that counts pollutant particles in the room
• A gas sensor (acetone, formaldehyde, benzene, etc.)
Together, these sensors measure pollution levels in your home. Depending on the level of pollution detected, the air quality indicator changes color and the filtration speed automatically adjusts to ensure optimal air quality.

Air quality indicator:

SMART SYSTEM
(depending on the model)
Intense Pure Air operates in speed 1, its most silent speed, and automatically adjusts in speed 2, when pollution is detected. It is the optimal combination of a purified air and quiet nights.

PERFORMANCE

FILTER CHANGE INDICATOR
The “HEPA” and “ODOR” indicator lights flash when the HEPA and activated carbon filters need to be changed. These indicators reflect actual purifier usage time as well as pollution levels in the room.

3D PURE AIR FUNCTION
Intense Pure Air is equipped with an adjustable air outlet grid.

COMFORT IN USE

SILENCE
Intense Pure Air is extremely quiet:
• BEDROOM MODELS: from 22 to 45 dB*
• XL MODELS: from 28 to 52 dB*

Night mode is an automatic mode which ensures air purification while remaining quiet enough to not disrupt the night’s sleep. Intense Pure Air operates in speed 1, its most silent speed, and automatically adjusts in speed 2, when pollution is detected. It is the optimal combination of a purified air and quiet nights.

Bedroom Models

Recommended area
Air flow
CADR smoke
Number of filters
Speeds
Timer/Delayed Start
Sensors
Air quality Indicator
Automatic Modes
Ambient Mood Lighting
Noise Level *
Filter Change indicator
Power (W)
Dimensions (mm)
Weight (kg)

Bedroom Models

 PU4020

 up to 35 m²

 110 m³/h

 150 m³/h

 4

 4

 1h/2h/4h/8h

 Particles

 •

 Auto + Night

 •

 Noise Level *

 22-45 dB (A)

 •

 Filter Change indicator

 30 W

 300x285x540

 5.5 kg

 XL MODELS

 PU4020

 up to 80 m²

 345 m³/h

 380 m³/h

 4

 4

 1h/2h/4h/8h

 Particles + Gas

 Auto + Night

 Ambient Mood Lighting

 Noise Level *

 28-52 dB (A)

 Power (W)

 80 W

 380x35x750

 7.5 kg

XL MODELS

BEDROOM MODELS

2 models depending on the room size

PRODUCT FEATURES

- NIGHT MODE
(depending on the model)
- SILENCE
- COMFORT IN USE
- PERFORMANCE
- FILTER CHANGE INDICATOR
- 3D PURE AIR FUNCTION
- SMART SYSTEM

* Sound pressure level measured at a distance of 1.5 meters from the air purifier in a semi-anechoic chamber.
**Method:**
Intense Pure Air was placed in a climate-controlled room measuring 1.4 m³. VOCs were injected in liquid form and their concentrations were continuously monitored throughout the testing process. Testing ended when 99% of each pollutant had been removed from the air.

(Cf. protocol 1, page 22)

**Results:**
- **VOCs Tested**
  - Acetaldehyde: 73.9 min
  - Acetone: 14.3 min
  - Toluene: 4.4 min
  - Heptane: 6.8 min

The time required to filter different VOCs depends on their volatility.

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**Method:**
Intense Pure Air was placed in a room measuring 30 m³. Cigarette smoke was generated by a smoke extractor at a concentration of about 5 mg/m³. The purifier was turned on and PM2.5 concentration was measured every 10 minutes.

(Cf. protocol 2, page 22)

**Results:**
- After 30 minutes, over 99% of fine particles had been captured.

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**Focus on...**
The efficiency of the HEPA filter on bacteria and viruses:
The HEPA filter is effective on small-size particles down to 0.03 μm. A recent INRS study shows that the efficiency of the HEPA filter even increases for particles down to 0.0025 μm. Given this performance, the HEPA filter is theoretically able to stop bacteria, viruses and yeasts that are larger than 0.0025 μm. Among them are:

- Bacillus anthracis
- Influenza Virus (Type A, H1N1)
- Canidia Albicans
- Legionella pneumophila
- Staphylococci aureus
- Influenza Virus (Type A, H3N2)
- H5N1 (0.05-0.15 μm)
- Rhinovirus
- Canidia Albicans
- Influenza Virus (Type A, H1N1)
- (0.8-1.2 μm)
- (0.01-0.5 μm)
- (10-20 μm)
- H3N2 (0.8-1.2 μm)
- H5N1 (0.8-1.2 μm)
- Influenza Virus (Type A, H1N1)
- (0.8-1.2 μm)
With its exclusive, patented NanoCaptur™ technology, Intense Pure Air offers the most effective filtration over time* of formaldehyde, the most dangerous pollutant in our homes.

Drawing on 10 years of research** in a French research center shared by the Atomic Energy Commission (CEA) and the National Center for Scientific Research (CNRS) – NanoCaptur™ technology is protected by five international patents.***

Made up of small nanoporous granules that look like glass, NanoCaptur™ granules microalveolar structure, which gives it a larger useful surface area.

The NanoCaptur™ filter also gradually changes color, from clear yellow to brown, making it clear and simple to check the filter’s condition.

Formaldehyde, releasing up to 100% of the gas once the filter is saturated.*

The NanoCaptur™ filter remains effective up to 12 times longer*, thanks to the granules microalveolar structure, which gives it a larger useful surface area.

In contrast, traditional filtration technology destroys formaldehyde. Intense Pure Air offers the most effective filtration over time* of formaldehyde, the most dangerous pollutant in our homes.

Pure Air offers the most effective filtration over time* of formaldehyde, releasing up to 100% of the gas once the filter is saturated.*

NanoCaptur™ granules once the filter has become saturated, material B and C release up to 100% of formaldehyde once the filter was saturated, in comparison with two of the most effective competing materials (materials B and C).

Testing was conducted to test the safety of NanoCaptur™ filter granules in terms their capacity to not release formaldehyde once the filter was saturated, in comparison with two of the most effective competing materials on the market (materials B and C).

Each of the three materials was first saturated with formaldehyde produced at a strong concentration. The amount of formaldehyde released by the material was then measured for 24 hours. (Ct. protocol 3, page 22)

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**CEA-CNRS licensed ETHERA technology. ***Total number of patents depending on countries.

*Tested in an external laboratory vs main competitive filtration technologies, November 2014.

**Method:
Intense Pure Air was placed in a climate-controlled room measuring 1.4 m³. Formaldehyde was injected in liquid form and its concentration was continuously monitored throughout the testing process. Testing ended when 99% of the formaldehyde had been removed from the air.

(Ct. protocol 1, page 22)

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Method:
Intense Pure Air was placed in a room measuring about 12 m². The pollutants (tobacco smoke, dust and pollen) were injected into the room and their concentrations were monitored during the testing process. CADR was then calculated using the following equation:

\[ \text{CADR} = \frac{V(Ke-kn)}{kn} \]

where:
- \( V \) is the volume of the test chamber (cubic feet = ft³)
- \( Ke \) is the total decay rate (min⁻¹)
- \( kn \) is the natural decay rate (min⁻¹)

These CADR values were then used to determine the ideal room size for the purifier and the number of times the device changes the air each hour.

(Ct. protocol 4, page 23)

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(Ct. protocol 4, page 23)
OPTIMAL HUMIDITY LEVELS
for more comfortable interiors

Preventing and treating air pollution in our homes is vital for good health. To control air quality, we also need to regulate indoor humidity levels, as breathing air that is too humid or too dry can harm our respiratory tracts. High humidity can also encourage the development of microorganisms such as mold and dust mites.

Home humidity levels vary greatly from one country, continent or climate zone to another. According to the WHO, humidity levels are too low in 10% to 50% of indoor environments in Europe, North America, Australia, India and Japan. (25)

Optimal humidity levels hover around 50% to 60%. Simple solutions can help maintain these levels, ensuring greater comfort and better respiratory health.

Effects on health
AIR THAT IS TOO HUMID
Air is considered too humid when relative humidity exceeds 70%.
When air is overly humid, microorganisms such as mold and dust mites can multiply, allergen particles can be suspended in air, and a variety of chemical pollutants can be released in the air.
In entering the respiratory system, these pollutants can cause chronic infections and gradual deterioration of respiratory mucosa, with consequences such as:
- lung disease, bronchitis and bronchiolitis
- chronic rhinitis and sinusitis
They can also irritate mucus membranes in the eye and cause:
- conjunctivitis
- damage to the surface of the eye
Breathing air that is too humid can also make asthma worse.

A FEW TIPS for controlling humidity levels at home
- Air rooms for at least 15 minutes in the morning and evening.
- Make sure that rooms exposed to high humidity are well ventilated.
- Avoid drying laundry indoors.
- Avoid houseplants that require very frequent watering.
- Keep living spaces at a comfortable temperature of 21°C and bedrooms at 19°C.

These tips may be helpful but they do not always ensure optimal humidity levels in your home. When that is the case, air treatment devices offer an interesting solution.

Humidifiers for environments that are too dry and dehumidifiers for environments that are too humid.

Rowenta® humidifiers and dehumidifiers allow you to measure and precisely regulate a room’s humidity level.

Source: CEPMMT (25)
ROWENTA® Humidifiers
INTENSE AQUA CONTROL

Our Intense Aqua Control humidifier ensures an optimal humidity level at home, thereby reducing the risk of developing respiratory difficulties linked to overly dry air.

**HYGROMETER TO MAINTAIN AN OPTIMAL HUMIDITY LEVEL**

The Intense Aqua Control humidifier is equipped with a sensor that detects air humidity and automatically adjusts the mist output according to the desired level of humidity.

**HEATING FUNCTION**

The “heating” function accelerates humidity production by 20% and destroys any bacteria that may have formed in the water tank.

A study conducted by the Lyon microbiology lab has shown that this function kills 100% of Escherichia coli and Staphylococcus aureus – the two most common strains of bacteria – after 30 minutes of operation under normal conditions.

**EASE OF USE**

The Intense Aqua Control humidifier is equipped with a ceramic disk that vibrates at an ultrasonic frequency to produce a fine mist of water.

With a 5.5-liter tank, it can operate for up to 18 hours at a flow rate of 300 mL/hr.

Rowenta’s thoughtful design includes an anti-scale cartridge that filters water before it reaches the vaporization compartment.

The humidifier can treat a surface of 45 m² and operates at a low noise level: 40 dB(A).

**SMART DISPLAY**

The humidifier is equipped with an LCD screen for clear and simple operation.

**3 AUTOMATIC PROGRAMS for different needs**

- **AUTO MODE**
  - Humidity is maintained at 55%.

- **BABY MODE**
  - Humidity is maintained at 50% to limit the risk of bronchiolitis. The device self-adjusts to ambient humidity levels and shuts off automatically after seven hours.

- **NIGHT MODE**
  - Humidity is maintained at 50%. Higher levels would increase the humidification of mucus, which is eliminated less often at night. The device adjusts to ambient humidity levels and shuts off automatically after eight hours.

In the “baby” and “night” modes, the LCD screen’s backlighting shuts off and beep sounds are deactivated.

**SILVER ION PRE-FILTER**

The pre-filter uses silver ions for a special treatment process. Silver ions have recognized antibacterial properties, and thus prevent the development of mold, fungus and bacteria.

**EASE OF USE**

Auto on/off timer, operating up to 24 hours.

Two modes:

- Continuous direct drain feature channels collected water to a drain system (such as a sink) using a hose.
- Water is stored in a large 5-liter tank to be emptied when full. The condenser shuts off when the tank is full.

Large capacity: Depending on the model, the dehumidifier can collect 16, 20 or 25 liters of water per day, covering a surface area of 90 m².
**Effectiveness of the Intense Pure Air purifier on volatile organic compounds (VOCs) and formaldehyde**

**Device and pollutants tested:**
- Device tested: Intense Pure Air « XL »
- Filter function inactive
- Flow: 340 m³/h

**Pollutants tested:**
- Acetone (CAS 67-64-1)
- Heptane (CAS 110-82-7)
- Toluene (CAS 106-48-3)

These four VOCs are considered to be representative of the pollutants generally found in homes.

- And formaldehyde (CH₂O, CAS 50-00-0)

**Testing methodology:**
Testing was conducted according to the standard GB/T 18801-2008.

**Materials and pollutants tested:**
- Formaldehyde (CH₂O, CAS 50-00-0)
- Tobacco smoke: particle size from 0.10 to 1 m
- These three categories of particles are considered to be representative of the majority of particle sizes found in homes.

**Test methodology:**
- Materials were first saturated with formaldehyde produced at a rate of 2 l/min for 24 h.
- Once the materials were saturated, formaldehyde production was discontinued. The materials were placed in a reactor with silica gel tubes coated with DNPH (2,4-Dinitrophenylhydrazine)
- Formaldehyde concentration was calculated regularly over a period of 24 hours, upstream of each material, by means of an ion-molecule reaction mass spectrometer (IMR-MS).

**Results:**
- The purifier’s intrinsic effectiveness for each particle category was then calculated using the following equation:
  \[ CADR = \frac{Q}{V} \]
  where \( V \) = Volume of test chamber (cubic feet = ft³)
  \( Q \) = Total decay rate, surface (m³/s) × h

  \( K_w \) = Natural decay rate, min⁻¹

  This equation was used to obtain \( \text{smoke CADR} \), \( \text{dust CADR} \) and \( \text{pollen CADR} \) values.

**Calibration of the purifier’s suggested room size:**
The <smoke CADR> was then translated into a suggested room size for the purifier, using the equation below:

\[ \text{Size of the room (ft}^2) = \text{smoke CADR (ft}^3/\text{minute)} \times 1.55 \]

**Calculation for the Intense Pure Air «Bedroom» model:**
Smoke CADR = 150 m³/hr, or 2.5 m³/minute, or 88.28 ft³/minute.

The suggested room size is 88.28 ft³/minute x 1.55 = 136.83 ft², or 12.71 m².

**Calculation for the Intense Pure Air «XL» model:**
Smoke CADR = 150 m³/hr, or 2.5 m³/minute, or 88.28 ft³/minute.

The suggested room size is 88.28 ft³/minute x 1.55 = 136.83 ft², or 12.71 m².

**Calculation of the number of air changes per hour:**
- Number of air changes = \( \frac{\text{CADR smoke (m}^3/\text{h})}{\text{surface (m}^2/\text{h})} \)

**Determination of the Intense Pure Air purifier safety with regard to formaldehyde**

**Device and pollutants tested:**
- Device tested: Intense Pure Air « XL » + Intense Pure Air « Bedroom »
- Tobacco smoke: particle size from 0.01 to 1 m
- Pollen: particle size from 0.5 to 3 m

These three categories of particles are considered to be representative of the majority of particle sizes found in homes.

**Test methodology:**
Testing was conducted according to the American standard ANSI/ AHAM A-1.

**Results:**
The purifier’s intrinsic effectiveness for each particle category was then calculated using the following equation:

\[ CADR = \frac{Q}{V} \]

where \( V \) = Volume of test chamber (cubic feet = ft³)

\( Q \) = Total decay rate, surface (m³/s) × h

\( K_w \) = Natural decay rate, min⁻¹

This equation was used to obtain <smoke CADR>, <dust CADR> and <pollen CADR> values.