Bureau d 'Expertise
en bâtiments

arbex s.à r.l.
85, rte de Luxembourg
L-8440 STEINFORT
Tél. : +352 20 40 50 60
Email : info@arbex.lu
Site : www.arbex.lu

Advice to reduce condensation problems in an apartment.

Why and how should be aired ?

1. **Evacuation of steam**
2. **Condensation and mould**
3. **Evacuation of smells**
4. **Supply of combustion air for devices with an open combustion cycle**
5. **Supply of oxygen for the inhabitants**
6. **Tobacco**

1. Evacuation of steam

- It is important to manage the overall ventilation and a good solution consists of creating a draught in the whole apartment (bedrooms included) for a few minutes in the morning and in the evening, so as to reduce humidity and increase the amount of oxygen in the air.
- An apartment that is occupied for 24h a day requires to renew this draught 3 to 4 times a day, according to the number of people occupying the place.
  - o Air that is rich in oxygen heats up quicker and easier than stale air. Therefore, it allows to reduce heating consumption.
  - o Leaving the windows open the whole day should be avoided during periods of cold (supply of humidity and cooling of structures).

  - o Airing for short periods and in a repeated manner does not give the structures and central heatings enough time to cool. The sensation of heat comes back quickly.
  - o According to the outside temperatures, windows should be wide open for a duration of :

▪ under 0°C	2 minutes	renewal of 10 X of the room's air volume
▪ between 0°C and 5°C	3 minutes	renewal of 15 X of the room's air volume
▪ between 5°C and 10°C	5 minutes	renewal of 25 X of the room's air volume
▪ between 10°C and 15°C	10 minutes	renewal of 50 X of the room's air volume
▪ over 15°C	no limit	no limit

  - o If there is no window in the bathroom :
    - ▪ the existence of a mechanical ventilation should be verified, as well as its correct functioning.
    - ▪ avoid having showers when the door is open.
    - ▪ leave the door closed after having left the bathroom to stop humidity to enter the apartment, and let the fan run long enough for the shower's humidity to be evacuated correctly.
    - ▪ We advise to get a fan with a hygrometer. This fan, if plugged directly, will automatically run should the bathroom's humidity exceed the desired maximum level.

arbex s.à r.l.
85, rte de Luxembourg
L-8440 STEINFORT
Tél. : +352 20 40 50 60
Email : info@arbex.lu
Site : www.arbex.lu

- In the kitchen :
  - Verify that the hood works correctly.
  - Verify that it is plugged directly to the exterior.
  - A hood that is equipped with a carbon filter without evacuation to the exterior only reduces smells. It does not reduce humidity created by the cooking of food.
- In the laundry room :
  - Drying the clothes inside of the apartment should be avoided.
  - For occupants owning a condenser clothes dryer, it is preferable to put it in the laundry room, in the basement or in a garage, but never in the apartment.

- For your information, this table shows the different sources of steam production in a household :

Source of steam production	***Production rate***
The occupants	*0.9 to 1.25 kg of water per day and per person*
Cooking meals for 4 people With an electric stove	*1 to 2 kg of water per day*
Cooking meals for 4 people With a gas stove	*2 to 3 kg of water per day*
Personal hygiene (baths, showers, etc.)	*0.2 to 0.5 kg of water per day and per person*
Drying clothes	*1.25 to 2.5 kg of water per day*
Cleaning the floor with water	*0.2 kg of water*
Green plants	*0.02 to 0.05 kg of water per day and per plant*

Internet source (FR) : http://energie.wallonie.be/fr/brochure-condensation-et-moisissures.html

2. Condensation and mould

- The problem of mould happens when inner humidity of the apartment condensates on zones of the thermal bridge.
  - As a reminder, the thermal bridge is a weak point (more or less important) in the isolation of a building's envelope.
  - When the rate of an apartment's air renewal is too low, steam produced by the occupants and their activities are not sufficiently evacuated and the air's humidity increases. Well-known condensation – and/or mould problems then appear initially on the walls' coldest surfaces : on simple glazings, on links between the exterior walls and the floors (thermal bridge), etc.
  - Always leave some space between the furniture and the walls so as to allow air circulation.
- Reduce thermal bridges :
  - by reinforcing the structure's isolation (front, if technically possible and considering the heat gain/expenses ratio).
  - Keep in mind that the more a house is isolated with a non-breathable insulator, the more condensation is privileged if the inner ventilation is not reinforced.
- Rooms not used :
  - Keep the doors closed between heated and non-heated rooms.
  - Maintain an moderate and ambient temperature in rooms that are not used.
  - The difference of temperature between two rooms should not be too considerable.
  - Rooms that are not used should be aired at least once a day.

arbex s.à r.l.
85, rte de Luxembourg
L-8440 STEINFORT
Tél. : +352 20 40 50 60
Email : info@arbex.lu
Site : www.arbex.lu

3. Evacuation of smells

- Sources of olfactive pollutants in an apartment are multiple :
  - occupants,
  - perfumes,
  - plants,
  - carpets,
  - cleaning products,
  - cooking, etc.
- In case of insufficient ventilation, the air suffers from :
  - smells of mould,
  - state smells, etc.
- Rooms being insufficiently aired can cause discomfort and complaints linked to the bad smells.
  - Usually, they do not cause any health problems.
  - But they influence the comfort of living.
  - The smells are particularly discomforting for people coming from the exterior.

4. Supply of combustion air for devices with an open combustion cycle

- Devices with an open combustion cycle :
  - gas stoves,
  - devices heating with gas,
  - fuel-oil
  - charcoal,
  - wood, etc.

  Do not work correctly without air supply. To make it work properly, it is mandatory to renew the air sufficiently in the room where the device is installed.

5. Supply of oxygen for the occupants

- Every human being breathes air to get the necessary oxygen to live. Nevertheless, the airflows involved are very poor compared to those required to guarantee a good quality of air and generally, they do not constitute a determining factor to define the rate of ventilation.
- In smoking areas, even a good ventilation does not allow a quality of air that presents no risk for health. The only solution consists of airing sufficiently in order to eliminate the smells so as to give people present the " feeling " of being in a healthy environment.

arbex s.à r.l.
85, rte de Luxembourg
L-8440 STEINFORT
Tél. : +352 20 40 50 60
Email : info@arbex.lu
Site : www.arbex.lu

6. Tobacco

- Tobacco is a very important source of air pollution. Besides the problems of smells and possible irritations, it induces not insignificant consequences on smokers' - as well as on non-smokers' health. As an example, in the new proposal of american norm concerning ventilation, it is not possible to obtain a quality of air that is acceptable in rooms where smoking is allowed (not even with a very intensive ventilation).

Schéma présentant la différence de l'évolution du point de rosée avec ou sans ouverture des fenêtres le soir.