# Practical Tips for Proper Ventilation

## Issue

Complaints about condensation buildup in apartments tend to increase mainly during the winter months. The consequences of such condensation buildup should not be underestimated. Possible consequences include:

- Precipitation/condensation on the interior side of windows
- Staining on windows and exterior walls
- Moisture damage to furniture
- Peeling of wallpaper
- Mold growth on window parts and exterior walls.

## Cause

As is known, indoor air always contains a (invisible) portion of water vapor. The colder the air, the less water vapor it can hold. When the air cools down, it releases water vapor, which primarily condenses on cold components such as windowpanes, doors, or the inside of cold exterior walls.

Another cause of condensation is the accumulation of moisture in indoor air. Water vapor from the kitchen and bathroom increases humidity, but also plants and humans themselves release moisture into the indoor air.

In cold bedrooms, condensation can occur solely through human respiration and transpiration.

Drying wet laundry inside the apartment is strictly prohibited.

## Solution

According to research by EMPA (Swiss Federal Laboratories for Materials Science and Technology), inadequate ventilation accounts for 80 to 90% of mold formation cases! In the past, there was significant air exchange due to leaky building envelopes. As a result, heavy heating was required, which made the use of air humidifiers necessary to maintain a comfortable indoor climate. Nowadays, building envelopes (façades, roofs, windows, doors) are optimally sealed for energy-saving reasons.

However, the tighter the building envelope, the more important regular ventilation becomes. In newer buildings with tight envelopes, increased ventilation is necessary to remove the high moisture content of indoor air to the outside.

According to SIA 180 standards, during winter, with an indoor temperature of 20°C and an outdoor temperature of -5°C, the relative humidity should not exceed 40%. In summer, a maximum humidity of 50% - 60% should be maintained.

## Questions and Answers

### How should ventilation be done correctly?

Windows should be fully opened 3 to 5 times a day for 5 to 6 minutes each time, depending on the moisture level (cross ventilation). This quickly removes a lot of moisture without losing much heating energy. Additional ventilation is recommended after cooking, after showering and bathing, and after using the laundry room. Prolonged ventilation unnecessarily cools the walls and promotes mold formation. Moist indoor air should not be directed into other rooms but directly to the outside.

### Should one ventilate in winter as well?

Yes, because the humidity in heated rooms is higher than in outdoor air, even during rain, fog, or snowfall.

### Is continuous ventilation in the tilted position advisable?

Continuous ventilation is only recommended during the warm season. Nevertheless, cross ventilation should occasionally take place. In the cold season, tilting leads to cooling of the exterior walls, which can cause damage. Moreover, a lot of heating energy is lost. In winter, ventilation in the tilted position (including in the cellar, garage, etc.) should generally be avoided.

### How warm should an apartment be heated?

From experience, the following guidelines are recommended for ideal room temperatures:

- Bedrooms: 17° to 20°C / Thermostat valve setting 2 - 3
- Living rooms: 20° to 21°C / Thermostat valve setting 3
- Bathroom: 22°C / Thermostat valve setting 4

Also, make sure that the door between the cooler bedroom and the warmer rooms remains closed during the heating season, except when ventilating!

### What should one do if condensation forms on the interior side of the windows?

Condensation on the inner pane may occasionally occur with insulated glass windows. This is an indication of good windows but also a sign that indoor air is too humid. Therefore, ventilation is urgently needed!

### Why does condensation form behind the wardrobe?

Insufficient air circulation in wall corners, niches, and surfaces of exterior walls with closely placed furniture can cause cooling and thus condensation. Therefore: ventilate and do not place furniture entirely against the wall - keep at least 10 cm away from the exterior wall!