

Proper heating and ventilation – how to avoid the formation of mould

Through proper heating and ventilation, not only does the building structure remain dry, but it also helps to maintain the residents' health.

Proper heating

In principle, all rooms of an apartment are to be sufficiently heated so that the internal surfaces of external structures are continually kept warm enough. For central heating systems, the control of the boiler temperature takes place according to the external temperature. The night time drop also takes place automatically. Switching the radiator valves continually on and off is therefore not necessary, because the anticipated saving effect is actually very low and only encourages the formation of mould.

It is particularly harmful when unheated rooms (e.g. bedrooms) are intermittently heated by other "warm" rooms. The warm air from the living area contains a relatively lot of moisture. The mixture of air and water is cooled in the non-heated room and the moisture carried in the air is then deposited on the cold internal surfaces (also behind cupboards, curtains, pictures etc.). Damp spots and the formation of mould then follow as a consequence.

Proper ventilation

The relative humidity in the apartment alongside an adequate room temperature is vital for an ideal room climate and high comfort.

Partly due to very thick windows, the humidity originating from the rooms (cooking, ironing, human respiration, house plants, washing up, etc.) must absolutely be removed by targeted



ventilation. The exchange of warm and damp room air with cold and dry external air takes place when windows are wide open and when ventilation is intermittent. During the colder period of the year, the external side of the open window steams up immediately by ventilation. The window should therefore absolutely be kept open until the external side has completely dried again and is mist-free. When the windows steam up (also only partly) on the room-side of insulation glazing, you must surely

assume that the air humidity in the room is too high and must be ventilated. By tilting open the window, a sufficient aeration cannot be achieved, but however a high loss of energy and a cooling of the window ledge are caused.

In a room heated at 21°C, 1m³ of room air contains approx. 9.3 grams of water at a relative humidity of 50%. When the size of the room is 20m², this equates to an amount of 465 grams of moisture in the room air. When, through ventilation, only half of the room volume is

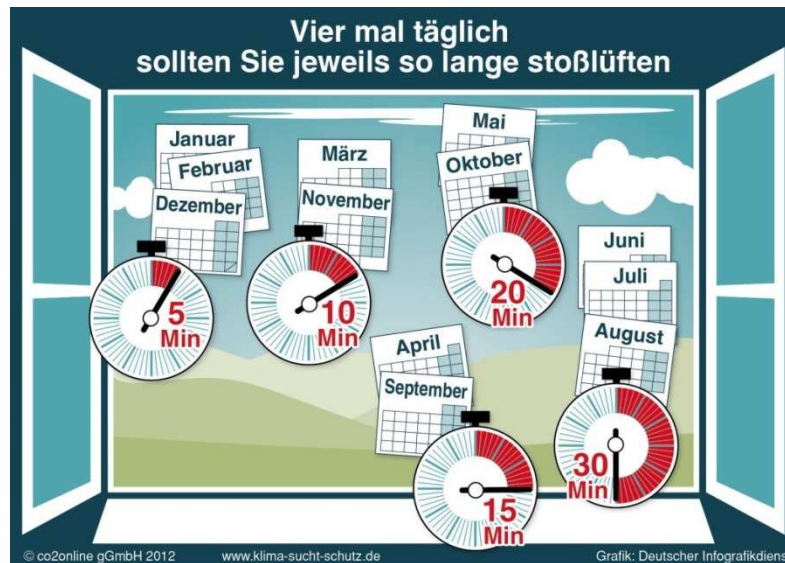
subjected to fresh air, only approx. 330 grams of water are to be found in the room after ventilation. When the room is heated up again to 21°C, the relative humidity is only 35%. If the rooms are not sufficiently ventilated, there may also be condensation of room air in corner areas and e.g. also on window ledges, even in well insulated buildings. If it is not quickly and effectively ventilated, mould mushrooms and all of their unpleasant and unhealthy side effects can form in the critical places.

If the following humidity values depending on the respective room temperatures are not exceeded, there should be no problems of mould during the winter. For the values stated, the humidity in the air is below the threshold value of 9 g/m³ of air.

Room temperature Degrees Celsius	Maximum acceptable rel. air humidity in %
15°	70%
16°	65%
17°	60%
18°	55%
19°	50%
20°	50%
21°	45%
22°	45%
23°	40%
24°	40%
25°	35%

Ventilation in summer

As soon as the outside air temperature is higher than in the building in spring/summer, the danger that ventilation leads to cooling of the air, and consequently to a deficiency of condensation on the internal walls, increases. When warm, humid air cools on cold surfaces, it leads to "sweating" on the wall surface. The most favourable ventilation times in summer are therefore when it is cool outside. This is the case during the evenings, the mornings and at night. The house doors and the cellar windows should remain closed in summer to prevent a layer of condensation forming on cold surfaces (particularly on cold cellar walls).



You should ventilate four times daily for the following lengths of time

January, February, December 5 mins
March, November 10 mins
May, October 20 mins
April, September 15 mins
June, July, August 30 mins

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Image: German Infographics Service

Storage of items in the cellar

Hygroscopic materials (fabrics, leather, cardboard, etc.) absorb humidity from the surrounding air and therefore promote moisture penetration, rotting and the formation of mould. As a result, such materials should generally be stored in the apartments.

Proper furnishing

Furniture, pictures and curtains on external walls prevent the heat transfer from the room air to the external wall. Furniture should be moved at least 10 cm away from the external wall and ceiling (provide air vents for furniture in the skirting area), so that the room air can circulate the exterior wall. Please note that for the most part the heat loss from radiator panels takes place from the visible area. Radiator casings reduce the heat emissions in the room by up to 35%.

Removal of mould

After drying out the wall, mould stains and mould mushrooms can be brushed off, as long as the humidity has not infiltrated too far into the plaster layer. Then the wall should be coated with a fungicidal product. This treatment must be repeated every few years.

Ammonium chloride or chloride dilutions often help in the advanced stage of fungal infestations. Instructions for use of these products must be observed with care. Stronger products (e.g. sprays of a sodium hypochlorite base) are only to be used by professionals because of the possible health risks. As an alternative, you can apply 5% vinegar essence or soda solution.