

## **Correct heating – correct airing**

### **Healthy living without mildew!**

Due to climate conditions in our longitudes, we have to have our living areas heated two third of a year in order to have comfortable temperatures. In the winter months when the living areas are heated more, there is the danger of mould in the houses and flats. The mould does not only effect the comfort and health of the residents, it also can effects the building substance.

#### **Additional background knowledge for you:**

Mould usually appears in the inside of outer walls – predominantly in bathroom, kitchen and bedrooms – but also behind bigger furniture and pictures. Aided by wet spots and marks caused by mould or mildew, which are quickly formed at these places, the spurs of mould flying in the air find the ideal fertile soil, where they grow and thrive. The result is often big dark mould stains and musty smells.

The first conclusion, that the wet places and mould are due to water leaking from outside, is often wrong, since in rare cases this is true that water the water comes from outside. Often the wetness comes from inside, that is from the air in the room: The air has the natural characteristic to absorb water and to store it. Thus, the air automatically contains a certain part of water in form of invisible water vapors. Yet the capacity of the air to store water and water vapor respectively is limited and is dependent on the air pressure as well as room temperature. The higher the room temperature, the more water and water vapor the air absorbs and thus the relative humidity is accordingly higher.

Example: 1 m<sup>3</sup> air can absorb maximum 5 grams water at the temperature of 0°C. Whereas if the temperature is increased to 20°C, the amount of water absorbed is 17 grams and at 30°C this can even reach up to 30 grams of water.

When the humid air cools down, the air can no longer store that much humidity and the saturation limit is exceeded. Thus the air secretes part of the humidity: the secreted humidity condenses and becomes water.

The condensing process takes place at those places of a room that have the least surface temperature. There the air is cooled faster and thus the saturation limit is exceeded there first. This is usually at the room ceiling closest to the outside wall, the corners between ceiling and outside wall as well as window lintel. Therefore, these places are called heat / cold bridges.

But the air can condense also behind big pieces of furniture, pictures or curtains because the air there does not circulate properly and the humidity is not transported sufficiently.

Only few people are aware how much the amount of water is that is secreted by the inhabitants of a normally lived in flat or house and thus needs to be absorbed by the air: During sleep, each human being secretes one liter of humidity via the respiratory tracks and the skin. Additionally the air is loaded with humidity while cooking, dishwashing, taking a bath or shower, washing, drying and other similar processes. Also the plants in the room add to the humidity since most of the water pored evaporates. Altogether in a 4-person household, 15 liters of humidity in form of water vapor is set free daily.

#### **Conclusion:**

The humidity absorbed by the air needs to be transported out of the flat or house by sufficient airing, so that when the air is cooled down, no humidity damages in form of mildew happens.

### **How do I heat correctly?**

By heating correctly, you can not only save energy but also create a healthy room temperature in your flat or house. If you heed our advices and recommendations, you can avoid trouble with your landlord and thus save costs; in many cases the mildew formation can be avoided.

Our recommendations and advices for correct heating:

- Heat all rooms in your flat / house sufficiently and continuously. Heat also the rooms that you do not use all the time or where you prefer lower temperatures.
- Do not let the temperature on the inside of the walls get lower than 17°C. Further, at the outside walls there should be sufficient air circulation. Thus, you should not put big pieces of furniture, especially ones with closed base close to the wall. Generally there should be a distance of 5 cm – 10 cm between the piece of furniture and the wall.
- Heat exchange of the radiator should not be hindered by pieces of furniture, coverings or curtains. Do not put things on the radiators. In case of heat storage due to hindrance near the radiator, the heat cost distribution rises by approximately 10 – 20 % which you have to pay.
- The doors to the lesser heated rooms should be kept close and the temperature in such rooms should be regulated by radiators in those rooms. Otherwise, too much humidity from the heated rooms gets into the cooler rooms, which cools down and condenses. Plants with big leaves and thus more evaporation should be kept in the heated rooms.
- Dry wet towels and pieces of cloths in open space as far as it is possible. Additionally, after use, you should dry the tiles as well as bath or shower tubs.
- Do not use surface sealing wallpaper and or color in order not to hinder the “respiration capacity” of the walls.

### **How do I air correctly?**

Room and flat airing should also find necessary attention. The airing is not only to replace the exhausted air with fresh and hygienic air but also to take the humidity loaded air out of the flat.

Be economical when airing but meet the necessity. While airing we lose heating energy but we should accept this in favor of a healthy room temperature and climate as well as for the protection of the building substance. Yet, the loss of energy should be minimized by airing short but intensive. Therefore the windows and doors should be opened wide and create a draught. Do not just tilt the windows. After five to ten minutes, the exhaust air is replaced by dry fresh air, which after short heating is capable of absorbing additionally humidity. This “patch airing” should be repeated few times a day. The “patch airing” has the advantage that only the heat of the exhaust air is let out but the heat stored in the walls as well as pieces of furniture remains and helps to heat the fresh air after the closing of the window.

Our recommendation and advice for correct airing:

- During the heating period, a “constant airing” by tilted window or door should be avoided because the loss of heat is bigger than in “patch airing”.
- Air all rooms shortly and intensively in the morning if possible – especially the bathroom and bedroom. Throughout the day you should air three to four times by creating a draught – especially after cooking, taking a shower or bath.
- During the airing you should turn down the heating valves and/or room thermostats. The closing of the heating valves should only be during the “patch airing” and after the airing they should be turned up again.