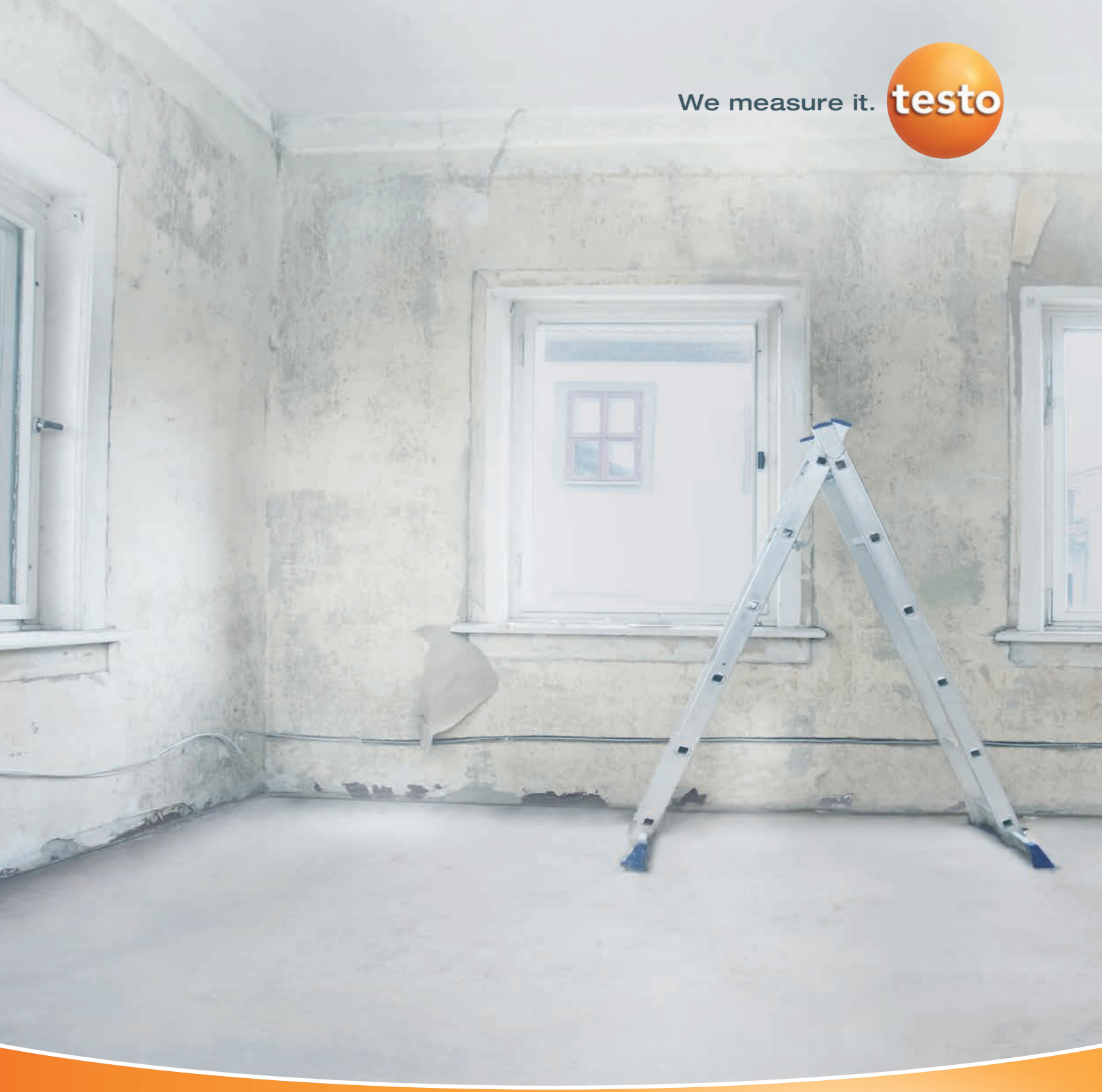


We measure it. testo

TESTOsolutions

Identifying damp walls and avoiding mould

When old buildings are restored, this is done with the best intentions. The restoration is carried out in order to correct defective heat insulation and to avoid the increased energy costs caused by this. This usually involves installing new windows. While this solves the problem of the heat insulation, modern windows seal so well that the necessary air exchange is hindered. The consequence: The air humidity increases, forming the basis for the feared mould growth on walls and ceilings.

How does mould develop?

Mould spores, the seeds of the mould fungus, are everywhere. In order to grow, they need – in addition to nutrients such as dust, plaster, wallpaper or wood – above all water. If, for instance, water has penetrated into the living quarters due to a burst pipe, or if the indoor air has been too damp over several days, mould spores find ideal living conditions. The more humid the air, the better the mould can grow. The causes can be constructional defects, incorrectly implemented restoration or insufficient heating and ventilation, for example. In addition to the damage to health caused by mould, the building substance is also permanently damaged. Because of this, mould needs to be identified and eliminated in time.

Isolating the causes

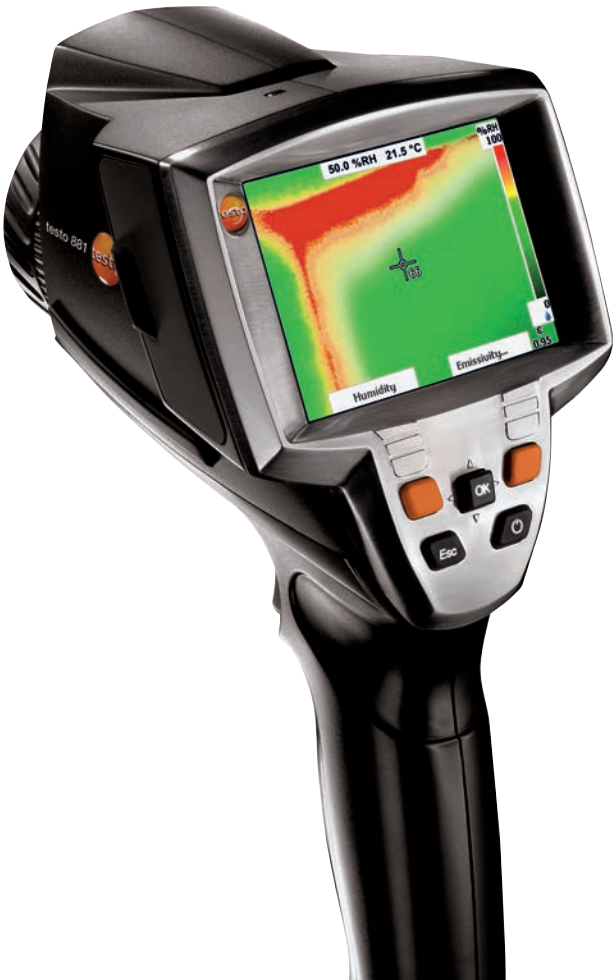
Once mould is in the building, the tenant initially supposes that the damp is coming from the outside. Many legal battles have ensued from the question of who is responsible for mould damage. It is very difficult to determine who or what has caused mould: the inhabitants or defective building construction? This is where modern measurement technology comes in. Contractors, experts and assessors usually have such measuring instruments in use, and can carry out in-depth research into causes within a very short time.

Measuring instruments for research into tenant-related causes	Measuring instruments for research into construction-related causes
Air thermometers e.g. **testo 610**	Surface (contact) thermometers e.g. **testo 905**
Humidity measuring instruments e.g. **testo 625**	Infrared thermometers e.g. **testo 830**
Multi-function measuring instruments e.g. **testo 635**	Material moisture measring instruments, e.g. for stone and wood e.g. **testo 616**
Data loggers e.g. **testo 175 H1**	Thermal imagers e.g. **testo 875**

The relevant measurement parameters

In order to detect moisture damage, the following measurement parameters must be recorded:

Parameter	Indicates...
Air temperature	...heating, ventilation and comfort in rooms.
Air humidity	...mould damage, and important indicator in technical building drying. Air humidity indicates how much water vapour is present in the air.
Material temperature	...the surface temperature of the material, and thus cold bridges, i.e. at which points heat is being drawn away from the material, allowing it to cool.
Material moisture	...the water content in mineral building materials. Measurements both at the surface (non-intrusive), as well as measurements in the material using an equilibrium humidity measurement (intrusive), are possible.



Detection of mould damage caused by tenants

The following measuring instruments are suitable:

testo 610 for contractors in heating and sanitation

Measurement of humidity and temperature in living quarters, bathrooms and new buildings

testo 610 is very small and handy, and can be carried with you conveniently at any time. testo 610 is simply held up in the room, and reliably, very accurately and at the touch of a button records the air humidity, temperature and dewpoint.

testo 625 for HVAC technology in buildings, quality assurance and production

Monitoring ambient indoor conditions

testo 625 measures air humidity, temperature and dewpoint. In inaccessible points such as corners at ceiling height, the measurement values can be transferred wirelessly over great distances by the wireless module to the measuring instrument.

testo 635 for HVAC technology in buildings

Testing of building substance and climatic conditions in and on buildings

testo 635 measures air humidity, temperature, material moisture and U-value. The user can store the measurement results in the instrument, and later analyze and document them using the PC software. This makes uninterrupted documentary proof possible.

testo 175 H1 for use in industrial areas

Long-term monitoring of air quality and indoor climate

testo 175 H1 continuously records temperature and humidity values and shows the dewpoint in the display. This allows the indoor climate to be monitored over a long period, underlining the necessity for a systematic exchange of air.

Detection of construction-related mould damage

The following measuring instruments are suitable:

testo 905-T2 for contractors in heating and sanitation

Contact measurement for the determination of surface temperature on radiators or heating systems

testo 905-T2 adapts itself perfectly even to rough surfaces, achieving a high level of measurement accuracy. This allows the temperature on the surface of a wall, radiator, on valves or connections in a heatings system, to be measured quickly.

testo 830 for contractors in heating, sanitation and air conditioning

Non-contact determination of surface temperature

testo 830 measures the surface temperatures of walls, ceilings and floors using infrared technology. This allows points which are too cold, at which humidity could precipitate, to be determined and if necessary countermeasures taken.

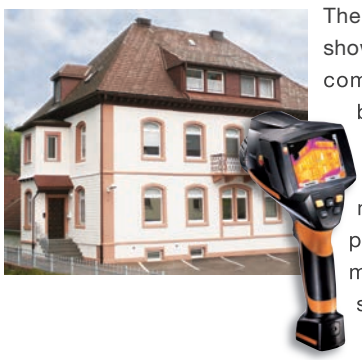
testo 616 for contractors in heating and sanitation

Monitoring material moisture in building materials, e.g. after water damage

testo 616 measures material moisture non-intrusively using a contact probe in wood, screed, cement and concrete at a depth of up to 5 cm. The instrument simplifies the work of anyone who must observe the drying processes of floors, walls and surfaces as well as moisture damage.

testo 875 for the building trade and for energy consultation

Identification of construction deficits on buildings



The thermal imager testo 875 shows deficits in materials and components, such as cold bridges, insufficient air-tightness, cracks in the brickwork or leaks, directly in the thermal image in the imager display. In the humidity mode, mould-risk areas are even shown up in red.

When the cause is incorrect heating or ventilation

Mould growth is in fact rarely caused by constructional deficits. The cause is more often the living habits of the tenants, for example incorrect or insufficient heating and ventilation of the living quarters. Because the humidity comes from the living quarters themselves, caused by the people, who automatically give off humidity to their surroundings. In colder places such as windows, this humidity leads to condensation, also referred to as “sweating”. For this reason, it must be extracted.

In a four-person household, between 8 and 15 litres of water daily are given off into the ambient air in the form of vapour. The warmer the room, the more water can be absorbed by the air. If this water vapour now meets colder air, a part condenses back to water, which then precipitates, especially in colder areas such as corners of rooms, behind furniture and on outer walls. Heating the living room in the winter, and leaving lesser used rooms such as bedrooms or bathrooms cool does not save heating costs. It actually increases them more than if the complete apartment were to be continually heated. The higher the temperature difference between the rooms, the greater the danger that condensation can precipitate on critical areas. In addition to this, damp wall conduct heat energy more quickly to the outside. The result is mould fungus and mildew.

Humidity caused in living quarters daily:

Cause	Humidity in litres
Humans sweating/breathing	approx. 1.0
Cooking	0.5 – 1.0
Showering/bathing per person	0.5 – 1.0
Drying laundry – spin-dried	1.0 – 1.5
Drying laundry – dripping wet	2.0 – 3.5
Houseplants	0.5 – 1.0

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Correct heating and ventilation

Observing a few simple heating and ventilation rules in the end not only prevents the development of mould in your apartment, it saves heating costs, protects the environment and ensures your own personal well-being.

Window and opposite door (or 2nd window), open wide 2 to 4 minutes

Window open wide 4 to 10 minutes

Window half open 8 to 15 minutes

Window ajar 30 to 75 minutes

Window ajar, blinds closed but ventilation slits open 45 to 120 minutes

Correct ventilation:

- Ventilate intensively several times a day with windows and doors open wide.
- No long-term ventilation with windows only ajar, as this cools the brickwork too much.
- Turn down radiators and/or thermostats.
- Ventilate intensively immediately after cooking or showering.
- Do not place furniture directly against outer walls, but pull them a few centimetres away.
- The warmer the outside temperature, the longer the need for ventilation. Ventilate for a quarter of an hour on warmer days (over 12 °C), three minutes suffice on days with continuous temperatures below freezing.

Correct heating:

- Ensure as uniform a temperature as possible in all rooms.
- Radiators must be freely accessible in order for the heat to be able to spread unhindered.
- Close blinds and curtains at night in order to avoid heat loss.
- Do not overheat the apartment. One degree Celcius of room temperature causes approximately 6% higher energy costs.
- Never switch heating off completely, even during longer absences. The rooms would otherwise cool down too much.

More information:

For detailed information and answers to your questions on our measuring instruments, contact our us at +49 7653 681 or www.testo.com.

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