Mold, mildew and efflorescence

All organic building materials can be affected by **mould and mildew** if the right conditions are present – primarily **too high moisture in the material**.

Efflorescence is a **chemical/physical process** that can occur in both organic and inorganic materials when water-soluble salts are transported to the surface and crystallize. Colloquially, this is often referred to as salt extraction.

What conditions must be met?

You can find mold, mildew, and efflorescence both indoors and outdoors. The occurrence varies depending on climate, the location of the building and local humidity conditions.

Mold and mildew require:

1. Organic matter that the fungus can live on
2. Moisture in which the fungus can thrive

If the fungus lacks either moisture or nutrients, it perishes. Wood and paint (even with fungicides) are examples of organic materials that can be attacked if conditions are present.

Efflorescence requires:

1. Presence of water-soluble salts in or on the material
2. Moisture, which dissolves the salts and transports them to the surface

When the moisture evaporates at the surface, the salts crystallize and form visible extractions.

If there is no elevated moisture in the material, mold, mildew or efflorescence can not occur.

The common denominator: Moisture in the construction, the typical causes:

- Lack of or insufficient ventilation (e.g. too tight cross-formwork)
- Missing openings for ventilated rear compartment (top and/or bottom)
- Defects in underlying structures that draw in moisture
- Wood cladding mounted too close to ground or tiles
- Use of wet joists or formwork
- Lack of sealing of end wood and nail holes
- Improper storage of materials (on soil or in the rain)

Osmosis and salt transport

An often overlooked problem is that wet building materials can start a process similar to osmosis – a self-reinforcing mechanism in which water moves towards areas with a high salt concentration.

When water evaporates from the surface, salts are left behind. These create a high concentration that attracts more moisture. This can lead to hydrostatic pressure in the material, which can damage surface treatments such as paint and oil.

The pressure may exceed the cohesiveness of the paint and may lead to: cracking, peeling, crumbling, separation of paint or surface layers.

Diffusion-open paint

Outdoor paints are diffusion-open, which means they allow a certain amount of moisture to pass through. The paint thus does not prevent efflorescence, but can in some cases reduce the amount of salts that reach the surface.

Prevention

- **Store building materials in a dry place, before and during the construction process**
- **Ensure effective ventilation in the structure**
- **Avoid mounting on damp/wet materials**

Even with good construction practices, problems can arise due to the sum of small errors. Therefore, it is important to be able to identify the cause if damage occurs.

Debugging

- **Assess the age of the building**: If it is a new build, the moisture is often from the construction process. If the building is older, you should look for new leaks.
- **Location of symptoms**: May indicate the source of the moisture.
- **Condition of the building material**: Cracks and defects can be entry routes.
- **Construction details**: Check wall and roof sections, ventilation, sheet metal and covering.
- **Laboratory reports**: May reveal the presence of salts and minerals.
- **Moisture sources**: Consider condensation, ground contact, stagnant air, leaking pipes, etc.

If problems with mold, mildew or efflorescence have arisen, it is important to eliminate the cause and remedy the problem.

Removal of mold, mildew and efflorescence

Once the moisture source has been removed, the surface must be cleaned.

- **Pressurized water: Effective, but can damage paint and wood. Wipe down to avoid new crystals if it is efflorescence you remove.**
- **Soapy water and soft brush: Gentle and effective method.**
- **Diluted vinegar: Can be used for both salt, mold and mold. Eco-friendly alternative.**
- **Rodalon and the like: Effective against mold, but use with caution and never mix with other cleaning agents.**

The surface should be wiped after cleaning so that the problem does not recur.

NOTE: Mold, mildew and efflorescence can permanently discolor paint and wood if it is allowed to sit for too long. Dark and transparent paints are particularly prone to discoloration by efflorescence, light colors are particularly prone to discoloration by mold and mildew.

If the paint has been destroyed by mold, mildew, osmosis or the cleaning itself, it must be removed and replaced with new treatment on all affected areas.