

MOULD RESTORATION SYSTEMS

Goodbye to Mildew in Interior Spaces





MOULD AND ITS ORIGINS

The Problem of Mould in Interior Spaces

Infestation with mould and mildew is one of the most common “environmental” problems in interior spaces. The reason mould grows is usually a higher moisture content in the respective building material or on its surface. Along with “wet” walls due to insufficient protection against driving rain or rising damp, the cause is often due to the insufficient thermal insulation standard found in old buildings, particularly when the air exchange rate has been reduced because of changes made to the building.

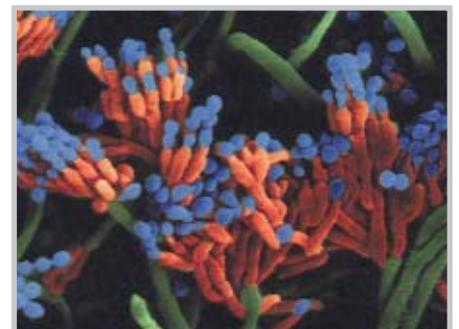
New windows are often installed without improving the insulation of exterior walls or taking into account that ventilation requirements are higher. Without sufficient ventilation, humidity on the surface of the walls rises, making it possible for mould to grow. Condensation doesn't even need to form. For most types of mould and mildew, 70% humidity is perfectly sufficient for growth.

The following conditions and factors are usually found when mould/mildew infests living spaces:

- Too much moisture is given off into the air of the room
- Ventilation is not executed properly or the capacity for ventilation is insufficient
- Insufficient heating
- Poor standard of heat insulation/heat bridges
- Furnishings have been put in the wrong place
- New windows have been installed when old buildings are restored.
- There is moisture in the structure, through insufficient protection of the facade against driving rain, missing or defective waterproofing, leaky roofs, dampness in new buildings or damage caused by water.



A mould culture under a microscope



Close-up of mould spores



MOULD RESTORATION SYSTEMS

All Mould Restoration Concepts from Just One Company

	Constantly high humidity (between approx. 70 and 99%)	Condensation forms on the surface of building elements (humidity \geq 100%)	Damp building elements <ul style="list-style-type: none"> ■ Rising damp ■ Insufficient protection against driving rain ■ Cracks in the exterior skin of the building
 Bioni Nature	 suitable	 makes sense as an interim solution	 unsuitable as the sole measure
 Mould Restoration Panels	 suitable extra benefit: thermal insulation	 suitable	 unsuitable as the sole measure
 Mould Restoration Render	 suitable extra benefit: thermal insulation	 suitable	 unsuitable as the sole measure
 Waterproofing & Facade Protection System	 in individual cases or as a supporting measure	 in individual cases or as a supporting measure	 suitable



REMMERS MOULD RESTORATION RENDER

The Classic Method for Getting Rid of Mould Permanently

Properties and Advantages

Remmers Mould Restoration Render is suitable for single layers from 20 to 50 mm thick. The set render is water vapour permeable, has good capillary conductivity and accelerates drying of damp surfaces. Because it has a low thermal transmittance coefficient, it also has thermal insulating properties. Mould Restoration Render has favourable deformation behaviour, low weight per unit area and, because of its thermal insulating properties, it raises the temperature on the surface of interior walls. This reduces increased humidity in the layers of air close to the surface and thus prevents spores from germinating in damp areas that are above the dew point. The render is water resistant and has high water storage capacity.

Through its capillary conductivity and ability to store water, this restoration render made by Remmers is able to lead off water so that it is no longer available to micro-organisms even in

unfavourable external or internal climatic conditions that start the condensation process. All of these properties prevent infestation with mould.

- Total pore space approx. 80 %
- Thermally insulating ($\lambda = 0,125 \text{ W/m}^2 \text{ K}$)
- Water absorption of up to 1.0 l per m^2 with just a 2 cm thick layer
- Optimal release of water during airing intervals
- Protects and maintains the value of existing building substance

Range of Use

- For restoration of walls that are at risk of mould
- To prevent condensation processes
- To save energy when renovating and restoring old and new buildings, particularly historical buildings and monuments

Because of its low weight per unit area and favourable deformation behaviour, Remmers Mould Restoration Render can also be used on substrates with less strength and load-bearing capacity, e.g. in historical buildings. It can be used on all mineral wall building materials that are suitable for the application of render and render bases.



1

PRE-TREATMENT

Mould spores must be bonded to the surface first by treating with Remmers Spore Binder. On small surfaces (< 0.5 m²) it suffices to kill the mould with Remmers Mildew Stop; on larger surfaces (> 0.5 m²) wall forming materials such as wall paper and render should be removed.



2

PREPARATORY MORTAR

After the substrate has been pre-treated, Remmers Preparatory Mortar is applied over the entire surface.



3

APPLICATION OF RENDER

Application of Remmers Mould Restoration Render.



4

WORKING WITH THE GRATED SCRAPER

The render surfaces are worked over with a grated scraper.



5

FINE FILLER

Surfaces worked over with the grated scraper are then leveled with Remmers Mould Fine Filler. Remmers Historic Fine Lime Filler can also be used.



6

COATING

A finishing coat of Remmers Mould Restoration Paint is then applied. Remmers Historic Lime Paint can also be used..



REMMERS MOULD RESTORATION PANELS

The fast method for getting rid of mould permanently

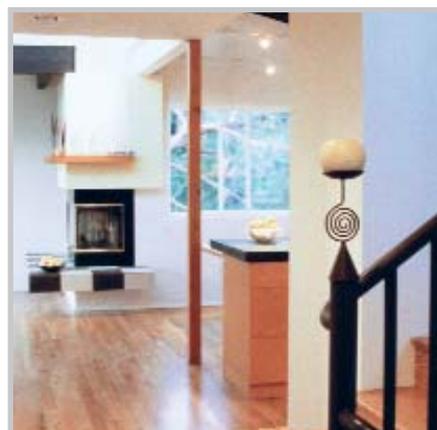
Properties and Advantages of Mould Restoration Panels

Remmers Mould Restoration Panels are made of pulp reinforced calcium silicate. They are extremely light and absorbent. Condensation that forms is absorbed and then given off again into the room over a large surface area during evaporation periods. The surface remains permanently dry and therefore mould spores do not find the conditions necessary to survive. And since the panels also have a high pH value of approx. 10.5 (alkaline), the growth of mildew is further retarded.

- Protect and maintain the value of existing building substance
- Reduce heating costs
- Improve the climate of the room
- Remedy damage caused by moisture
- Prevent reinfestation with mould
- Construction of physically correct system solutions
- Natural material that is safe
- Cost advantage through a space saving solution and simple handling

Interior Insulation without Moisture Problems

Remmers is a specialist when it comes to facades on old buildings. For aesthetic reasons or when preserving historical buildings, exterior insulation is not desirable. In these cases, the Remmers Mould Restoration Panel System, used as interior insulation, clearly improves thermal insulation and the facade can be preserved as it is. But before interior insulation is carried out, a professional should be called in to analyse the state of the building.



Restoration of Damage Caused by Mould or Water

Remmers Restoration Panels are suitable for permanently restoring the interior sides of exterior walls that have a problem with condensation and the resulting consequences such as a musty odour, disintegration of interior render, detachment of wall paper or coatings as well as the growth of mildew and the health problems that can arise from this. The panels are especially effective if condensation has been forming on the walls.

If, along with the formation of condensation, there are also other causes for the moisture, a professional should be called in. Structural defects such as defective horizontal or vertical waterproofing or facades that are not driving rain tight must be remedied first.



1

PRE-TREATMENT

Mould and bacteria spores must be bonded to the surface first by treating with Remmers Spore Binder. On small surfaces (< 0.5 m²) it suffices to kill the mould with Remmers Mildew Stop; on larger surfaces (> 0.5 m²) wall forming materials such as wall paper and render should be removed.



2

APPLYING THE MORTAR

After cleaning, the Attachment Mortar SLP is applied to the pre-wet wall which is then combed with a toothed float. To avoid gaps between the panels, cement should also be applied to the butt ends.



3

ATTACHING THE RESTORATION PANELS

When attaching and pressing the panels in position, make sure that the panels are properly pressed together in butt areas. Any excess panel cement is then removed.



4

PRIMING

To prevent the subsequently applied filler from "burning", the panels are primed with Remmers Deep Primer W.



5

LEVELLING

Uneven areas are levelled with Remmers Mould Restoration Filler or Remmers Historic Lime Filler.



6

COATING

A finishing coat of diffusion open, capillary open, alkaline paint is applied (Remmers Historic Lime Paint or Remmers Mould Restoration Paint).



REMMERS BIONI NATURE

The Revolutionary Way to Get Rid of Mould Permanently

Properties

Remmers Bioni Nature is not just a cutting edge problem solution for rooms that already show signs of mould. The coating is also ideal for all areas where you would like to have a healthy and hygienic climate in the room. Remmers Bioni Nature is furthermore diffusion-open, solvent-free and “non-combustible” and is distinguished by high scrub resistance, outstanding hiding power as well as excellent working properties.

An essential characteristic besides its permanent anti-microbial effect is the paint's safeness as far as the hygiene of room air is concerned.

This was confirmed, not only within the scope of extensive examinations by TÜV Product and Environment, which awarded Bioni Nature the TÜV Rhineland mark for wall paints tested for emission, but was also impressively proved by a certificate stating that the paint is “recommended for living spaces from a medical standpoint” issued by the German “committee on health in residential housing and building hygiene.”

Advantages

- Resistant to mould and mildew through nanosilver
- “Recommended for living spaces from a medical standpoint”
- Does not pollute room air
- Diffusion-open
- Non-combustible (A2)
- Hard wearing and scrub resistant (wet abrasion class 2)
- Hiding power class 2
- No solvents or plasticizers
- Gentle to the environment and good for your health
- No fogging-active substances
- Low odour





Mould and Mildew in Interior Spaces

Micro-organisms such as fungi and bacteria are found everywhere and are an important and natural part of the environment. However, when they appear in the form of mildew on walls, they quickly become a nuisance and a problem. When restoring the damage caused by moisture and mould, wall paints formulated with biocidal ingredients are often used. These can remedy the problem over the short term but are not a satisfactory solution for the problem over the long term. There is a time limit to the effectiveness of the biocidal and fungicidal ingredients used in the paints and the risk these ingredients present to your health is meanwhile undisputed.

Using Silver to Combat Micro-Organisms

Remmers Bioni Nature stands for a quantum leap in paint technology. Based on the latest findings in nanotechnology research, it was possible for the first time to develop an interior paint that has permanently high resistance to mould and does not pollute the air in the room. To achieve this, we have utilised the century old knowledge that SILVER has a strong anti-bacterial effect.

As an essential component in a new type of nano-ingredient combination jointly developed with the Fraunhofer Institute for Chemical Technology, the tiny nanosilver particles in Remmers Bioni Nature adversely affect important metabolism processes in micro-organisms, causing them to die on the surface of the coating.



REMMERS NANOTECHNOLOGY

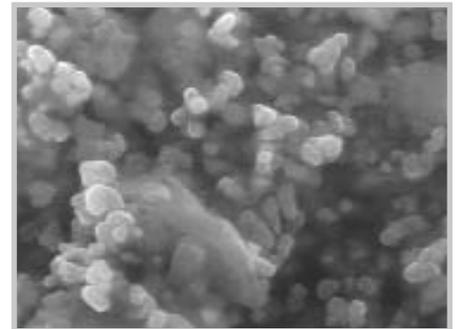
Sensational Success in Practice

Research and technology

Remmers' product philosophy is reflected by its desire to develop "intelligent coatings for buildings" that are equipped with special functions and therefore have added benefits for customers and users. To achieve this, it is necessary to continuously utilise the latest scientific findings and technologies. Nanotechnology plays a key role here.

In the Realm of Dwarfs

Nanotechnology is increasingly being paid attention to the world over and has already been designated the key technology of the 21st century. Nano comes from the old Greek word "Nanos" which means "dwarf". Research in the field of nanotechnology deals with the smallest particles from which materials are composed. The basis for products with special properties can be created at this lowest level. Nanotechnology makes it possible to selectively change the properties of surfaces so that they can fulfil practically any desired function.



With a diameter of 10 nanometre (which corresponds to one hundred-thousandth of a millimetre), the materials that are developed in nano research are 5,000 times more narrow than a human hair and have the same relationship in size to a soccer ball as a soccer ball has to the earth.



Functionalised Coatings

We work closely with leading research institutes when developing new products. The starting point for every research project begins with a market-oriented problem, for example mould in interior spaces. On the basis of the latest scientific findings in nanotechnology, it was possible, together with researchers at the Fraunhofer Institute for Chemical Technology, to develop an active ingredient combination that gives wall paints permanently high resistance against microbial infestation with mould, bacteria and germs without polluting the air in the room or harming the environment.

To be able to guarantee our customers the highest degree of product safety, Remmers coatings are continuously subjected to extensive testing.

The following testing institutes have tested Remmers Bioni Nature:

- TÜV Product and Environment, Cologne
- Material Testing Office for the Building Trade, Hanover
- Official Material Testing Institute, Bremen
- Institute for Hospital Hygiene and Infection Control, Giessen
- Research Institute for Pigments and Varnishes, Stuttgart
- Fraunhofer Institute for Construction Physics, Holzkirchen
- Rhineland-Westphalian Technical College, Aachen
- Research and Development Association for Varnishes and Paints, Magdeburg
- Registered Certification Association of the Concrete Industry NRW
- ISEGA Research and Examination Association, Aschaffenburg
- Rhineland-Westphalian TÜV, Essen
- Dubai Municipality, Dubai (VAE)



REM-photographs of the surface of the Bioni coating. What you see here is the layer close to the surface with the nano particles that are bedded in the binder. (Photograph: Fraunhofer ICT)

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