



Press Release

Nanotechnology - The Key Technology of the 21st Century

A major breakthrough prevents mould, mildew and fungus forming inside buildings

**A new type of coating puts an end to micro-organisms permanently and non-toxically;
deploys nanotechnology - provides the solution to mould and problems with hygiene**

In the course of a research project, the German paint and coatings manufacturer Bioni CS GmbH, together with research scientists of the renowned Fraunhofer Institute for Chemical Technology succeeded in developing a new type of coating. This coating, non-toxic and based upon nanotechnology, not only permanently prevents the formation of mould on walls, but also very effectively reduces common hospital germs which are resistant to antibiotics.

Conventional biocides, fungicides and preservatives are a thing of the past. The newly developed nano-formula coating, consisting of particles one thousand times smaller than most mould spores and bacteria, contaminates neither the air in the home nor the environment.

The Innovative Coating in Detail

Both Annoying and Dangerous - mould and mildew in the home

Micro-organisms such as fungi, bacteria and algae are all around us and are an important, natural part of our environment. However, when they appear as mould on a wall, they quickly develop into an annoyance and a problem.

For a number of reasons the problems associated with mould on interior walls have commanded greater attention all over the world over the last few years. On the one hand, the number of instances of damage caused by mould within buildings has risen as a consequence of modern methods of construction and the necessity to save energy. On the other hand, doctors and the medical community have been logging an increasing number of cases of respiratory complaints as well as allergies, due to the exposure to mould and mildew.

Conventional "anti-mould, anti-mildew paints" are effective only over a limited period of time and can endanger both the health of the dwelling's occupants and the environment

The basic pre-condition necessary for the formation of mould and mildew in living areas is dampness. Increased humidity in the home can have a variety of causes. In addition to "operator error" such as poor ventilation practices, or elevated levels of moisture being produced by the occupants, quite often physical aspects of the construction, such as thermal bridges, are responsible for the growth of mould. These are usually confined to certain areas of the shell of the building (e.g. corners) where, due to the geometry or the difference in thermal conductivity, a larger thermal flow occurs compared to the immediately surrounding components of the building. This results in differences in surface temperatures, especially where air conditioners are heavily used; in addition there is also the danger of falling below the dew point, leading to condensation and the formation of mould and mildew.

Often "anti-mould, anti-mildew paints" are applied, in an attempt to remedy mould and mildew damage. These can help in the short-term but are not a satisfactory long-term solution to the problem. The biocides and fungicides contained in these paints are effective for a very limited period only and the danger they pose to both the health of the occupants and the environment is undisputed today.

Nanotechnology Has Provided a Revolutionary Solution

The goal of the research project undertaken by the Fraunhofer Institute for Chemical Technology and Bioni was to develop a formula for a coating or paint to prevent the formation of mould not only temporarily, but lastingly, over a period of many years. Simultaneously, the new coatings were to release absolutely no contaminants into the air in the home, in order to protect both the health of the people and the environment. To achieve these goals, the latest discoveries in the field of nanotechnology were brought to bear. Non-toxic nano-particles with an average diameter of approximately 10 nanometres (equivalent to one hundred thousandth of a millimetre) constitute the most important component of the newly developed, antibacterial coating called Bioni Nature. These key particles are thus approximately 1,000 times smaller than most of the fungi spores and germs which are targeted. The results of the microbiological investigation have shown that when fungi spores come into contact with Bioni Nature and its integrated nano-particles, they are destroyed in a very short time.

A Quantum Leap in the field of Paints and Coatings

- the environmentally-friendly fight against mould and mildew

Since the nano formula developed by the scientists consists of solid bodies which are chemically extremely stable, the anti-microbiological efficacy of the coating is permanent. The usual rapid decline in the efficacy of the protection provided due to the gassing of the active agent, as happens when volatile biocides are used in conventional paints does not take place. By virtue of these properties and our refusal to consider conventional biocides, solvents, plasticizers and preservatives, the quality of the air in the home is assured by the use of Bioni coatings. The "TÜV Produkt und Umwelt" (a famous German test and evaluation institute) based in Cologne, has confirmed these findings and awarded Bioni interior paints and coatings the much-coveted "TÜV Rheinland Signet" for emission-free paints and coatings.

Hospital Germs are also in the Firing Line

Not only mould and mildew have been in the news lately. Reports from all over the world describe dangerous hospital germs, resistant to antibiotics. According to the estimates available, in Germany alone around 500,000 people are infected every year. The new Bioni coatings are extremely effective against even these germs, otherwise resistant, according to studies conducted by the "Institute for Hospital Hygiene and Infection Control (IKI)" in Giessen, Germany. When brought into direct contact with the Bioni coating, a 5-log reduction (99.999%) was proven in the dangerous hospital micro-organisms *Staphylococcus aureus* and *Enterococcus Faecium*. Bioni Hygienic, especially developed for use in medical facilities, is thus able to improve hygienic conditions in hospitals and clinics not just permanently, but also healthfully.

There are Many, Many Applications...

Bioni coatings incorporating nanotechnology are suitable for a great variety of applications. Not just simply rooms subject to dampness and mould and mildew, but also areas accommodating particularly sensitive occupants, such as children, people with allergies, or elderly people. Children's' bedrooms, schools, kindergartens, bathrooms, showers and toilets, hospitals, retirement homes for the elderly - all these benefit from an elevation in the level of hygiene as do living rooms and bedrooms afflicted by mould and mildew, offices, warehouses, manufacturing facilities, hotels and indoor swimming pools.

The Fraunhofer ICT has recognised that the nano formula used in the Bioni coatings endows an antibacterial effect to not only Bioni's facade paints and coatings; they are now planning to extend the technology to other branches of industry. Numerous enquires from all over the world are waiting to be dealt with. Just some of the future areas of application include the coating of dental implants, synthetic bones, catheters, cardiac valves, packaging for the foodstuffs industry and toys.

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