

Preliminary study in laboratory of NOVELIO® CleanAir concept

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Trade mark: Paintable wallcovering NOVELIO® CleanAir

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Summary description: Paintable wall covering made of glass fabric (75%) with
organic coating (25%) doped with formaldehyde absorbent agent.

Date of the report : October 13th, 2009 this report comprises 5 pages and appendix

This report of analysis attests only characteristics of the samples
submitted for testing and does not prejudge characteristics of similar products.
It thus does not consist a certification of product.

With the collaboration of EUROFINS Product Testing A/S



Context of the study

Indoor air quality is a major concern. Indeed, the interior air contains a large number of volatile organic compounds (VOCs) of which some are harmful and **develop nuisances** such as headaches, irritations, asthma, nausea, discomforts...

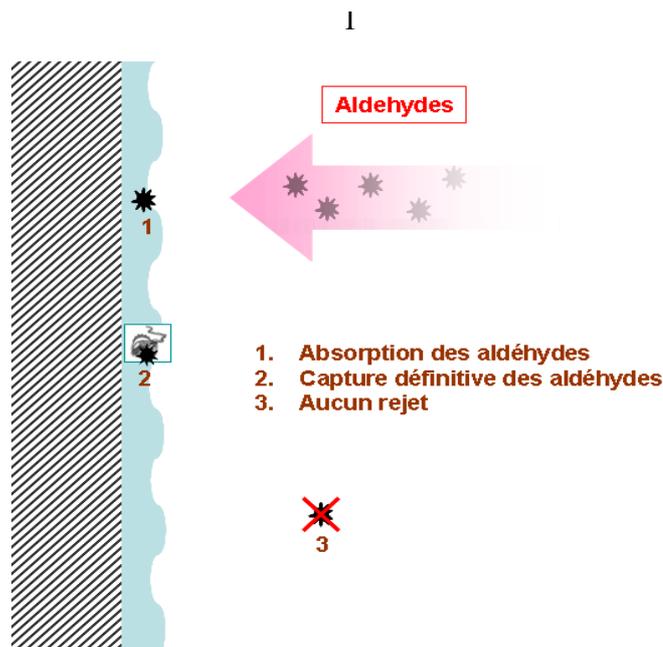
A study showed that we pass more than **90% of our time inside**: room, school, office, car, public building. A collective awakening is being fitted to improve interior air quality.

Among VOCs found in indoor air, the **formaldehydes** hold a very important attention because of their dangerousness and of their presence in a large number of components such as the laminated pieces of furniture, floor coverings, paintings, sticks...

As an indication, the World Health Organization (WHO) fixed a threshold value of recommendation for **formaldehyde at 100 µg/m³** in interior spaces.

The coating to paint **NOVELIO® CleanAir** contains an active component. It helps to reduce to a significant degree formaldehyde concentration in the interior air without carrying touched to the health of its occupants.

Principle of action of the coating to paint Novelio® CleanAir



This study was undertaken in collaboration with laboratory EUROFINS Product Testing.

1- Aim of the study

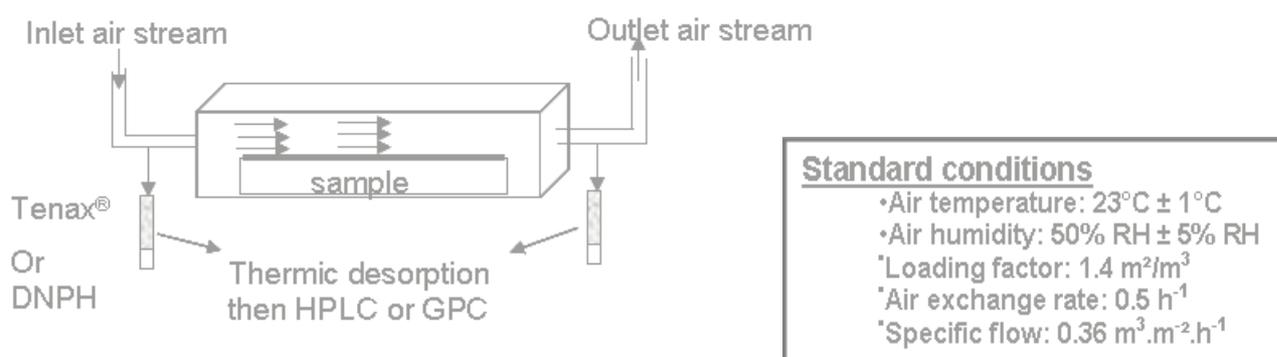

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The objective of this study is to evaluate the efficiency of the paintable wallcovering Novelio® CleanAir in term of capacity for formaldehydes sorption.

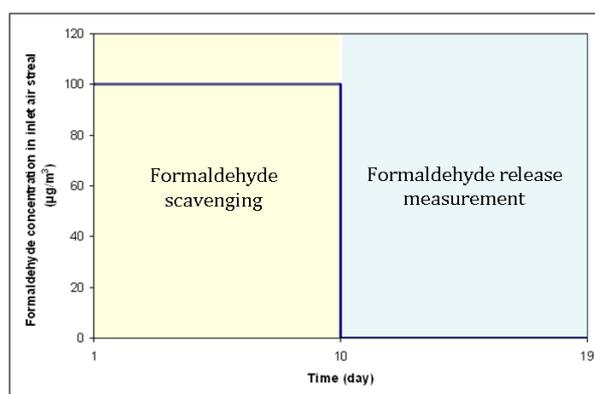
2- Evaluation of the efficiency

In order to evaluate the performances of Novelio® CleanAir, tests inspired from the standard ISO 16000-9 (Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method) were carried out.

The sample is placed in a chamber tests (23°C, 50% HR). An air flow polluted out of formaldehyde is injected into the chamber. The residual formaldehyde concentration is measured in the outlet air flow (see picture below).



Sorption capacity of a sample will be associated with a desorption measurement (release): this checks the irreversible effect of the material. A clean air flow is injected for this measurement of “release”: the formaldehyde rejected by the sample is measured in the outlet air stream. One can summarize the kinematics of these tests by this graph:



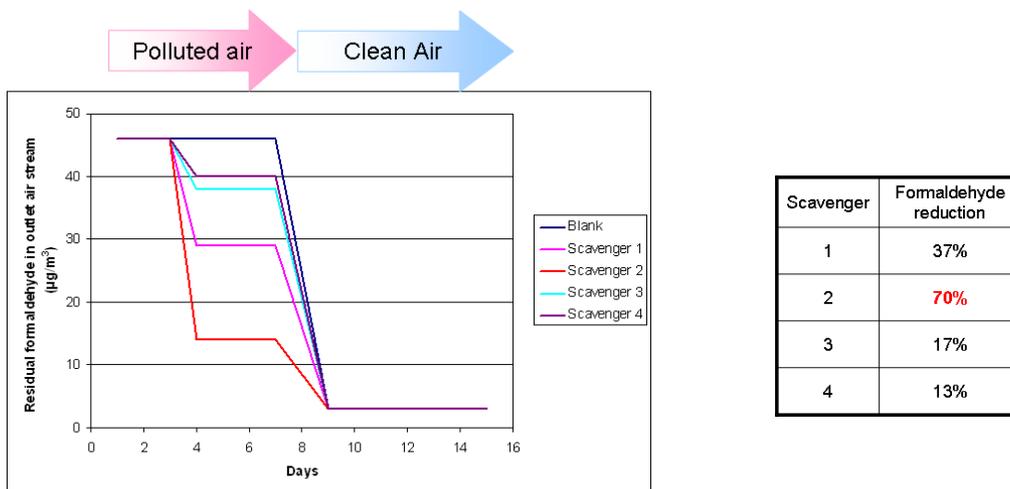
These tests simulate a non-ventilated room subjected to sources of formaldehyde.

3- Comparative study of the performances of various aldehyde scavengers



Four types of formaldehyde scavengers (numbered 1 to 4) at content of 15g/m² in the glass fabric were tested.

These samples were placed in the climatic chamber with an air flow polluted with formaldehyde (50µg/m³) for the first phase of measurements (values are provided in the appendix).



Of this first study, it appears clearly that the wallcovering containing the scavenger 2 gave the best results with an important reduction (- 70%) of the formaldehyde concentration at the exit of chamber test. Moreover, no formaldehyde release was detected in the air during the tests of “release” (the limit of detection is fixed at 3 µg/m³).

These first tests highlight that the best reduction ratio is of 70% (with the scavenger 2, which will be used thereafter).

4- Comparative test between a fabric standard Novelio® and CleanAir

The following systems were prepared for these tests:

Composition of the standard system:

Plasterboard	Vinyl adhesive	Wallcovering	Finishing
Standard BA13	Standard	Standard 128	Standard acrylic paint

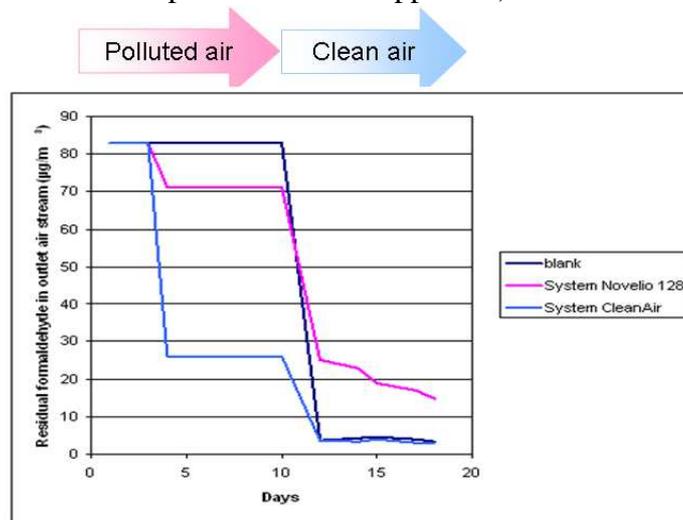
Composition of the CleanAir system:

Plasterboard	Vinyl adhesive	Wallcovering	Finishing
Standard BA13	Standard	CleanAir	Standard acrylic paint



These samples were placed in room tests with an air flow polluted with $83\mu\text{g}/\text{m}^3$ of formaldehyde for the first phase of measurements.

The figure below presents the experimental results obtained (the curves are smoothed for a clearness purpose; the values are presented in the appendix).



By comparison with an empty chamber (**blank**), the standard system (**System Novelio 128**) absorbs the formaldehyde ($10\mu\text{g}/\text{m}^3$; -13%). Nevertheless, the formaldehyde trapped is then released slowly (second phase of the test).

On the other hand, the system CleanAir (**System CleanAir**) reduced the formaldehyde concentration ($57\mu\text{g}/\text{m}^3$; -68%) and no release was measured.

Conclusion

It appears clearly that the paintable wallcovering **NOVELIO® CleanAir** enables a **very significant reduction (about 70%) and in an irreversible way** of the formaldehyde concentration in chamber tests under normal conditions of use.

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