

## Association of Conscious Consumers Product Test: VOC and formaldehyde emission of white wall paints

*The Association of Conscious Consumers laboratory tested twenty-three white wall paints for their volatile organic compound (VOC) content and formaldehyde emission. The products were scored according to their VOC content, formaldehyde emission level and to presence of isothiasolinone preservative.*

The Association of Conscious Consumers, Hungary, conducted accredited laboratory tests on twenty-three white wall paints and analyzed their VOC content and formaldehyde emissions. Products were also scored on the basis of their isothiasolinone content that is an allergenic preservative – this aspect was evaluated according to the information provided on the product label, not on laboratory test results.

Indoor VOCs, including formaldehyde, are released into the air partly from furnishings, curtains, wall-papers, paints and glues. Indoor VOC exposure can cause headache, respiratory tract diseases, eye and throat irritation, and reduce ability to concentrate. The potential long-term effects include liver or nervous system damage. In large concentrations, formaldehyde may cause allergic reactions and increase the risk of cancer.

### Results

Laboratory tests were conducted to measure VOC content, and formaldehyde emission from paints in confined space for twenty-four hours at 23°C. According to EU regulations VOC content is limited to a maximum of 30 gram per liter. There is no direct threshold limit value for formaldehyde. The occupational health limit for formaldehyde is determined by a Hungarian ministry decree, which allows 0.6 milligram per cubic meter concentration in the air in confined spaces.

All tested products contained less volatile organic compound (VOC) than the official threshold limit value. However, the measured values showed huge deviation. While the lowest VOC content was 0.04 gram per liter, the highest measured value was 2.79 grams per liter.

Formaldehyde emission showed a large deviation as well. While in one product formaldehyde emission was under the limit of detection, the lowest detected concentration was 0.006 gram per cubic meter, and the highest emission was five hundred times higher, 2.83 gram per cubic meter. Thirty percent of the tested products' formaldehyde emission was higher than the 0.6 gram per cubic meter threshold based on the occupational health limit value.

Consumers have to take into consideration that VOC and formaldehyde emission is highly dependent on ventilation conditions and temperature, and occasional use consumers are not frequently exposed to VOCs. Nevertheless, consumers are advised to choose products with lower VOC emission and maintain good air ventilation.

Only one product, the OBI indoor white wall paint, did not contain formaldehyde. One product (*Poli-farbe Platinum white, water-based interior-paint*) was labelled as formaldehyde-free,

but the laboratory test detected formaldehyde emission, although not the highest value among the test results.

The final scores included the allergenic isothiazoline preservative content on the base of product labels. Altogether 4 product labels did not list isothiazoline component, the same products received the best scores according to all the other tested parameters.

### **How good are third party certified products?**

The best product was the anti-mold *Kreidezeit Lime Paint* reaching 99% of the potential scores, the second bests were OBI's own brand product and the *Bio pin* interior white wall paint, closely followed by products of *Düfa*, *Swingcolor* and *Dulux*. All of them received good scores for the low VOC content and formaldehyde emission. However, another *Dulux* product was placed at the end of the list due to the high VOC content.

More products of *Polifarbe*, *Dulux* and *Tikkurila* reached low scores due to their highest VOC content and formaldehyde emission. At the same time several *Polifarbe* products scored above 90%, so there are significant differences between products of the same brand.

Mold growth is a widespread problem in poorly insulated buildings. Using anti-mold paints is a chemical solution to control mold. The test covered 5 anti-mold products, and 4 of them scored among the best products.

Two products had independent third party certifications. The *Kreidezeit Lime Paint* had *Öko test sehr gut* certification and also had good scores in the test. The *Schöner Wohnen Polarweiss* paint had *Blau Engel* certification. It had low (good) emission results and had a 95% score, however some of the non-certified products had better emission results than this product. The test evaluation concluded that independent, third party certifications can provide good guidance for consumers, but that not only certified products are good.

### **Are the more expensive products better?**

The unit price of the best scoring products were 4.7 EUR and 1.1 EUR per liter. On the other end of the list products costed 0.5 EUR, 6.3 EUR and 22.5 EUR per liter. Thus price is not always the best quality indicator.

### **What do product labels indicate?**

Maximum VOC content has to be labelled on paints. The comprehension of labels may be difficult for consumers, since manufacturers communicated only their compliance with the legal limits on the significant portion of products: "not more than 30 g/l". This means that the VOC content can vary between 0 and 30 gram per liter. This kind of labeling does not give sufficient information for consumers given that the laboratory test found significant, as much as seventyfold, difference between the VOC content of products.

In case of those 1 l wall paints, where manufacturers provided more information on the labels than the legal minimum and indicated realistic VOC values, the information was proved to be correct. The laboratory tests found lower VOC content than the indicated values. Thus

consumers can trust products with a more accurate labeling than the legal minimum. These products usually contained less VOC than products labelled as “not more than 30 g/l”.

### **How can consumers reduce the harmful emission in their homes?**

For example, when consumers paint the room of a new-born child with paint that contains volatile organic compounds, they risk the development of the asthma or allergies.

The most harmful components are released from paints in the first months. If consumers frequently ventilate, harmful compounds can clear more quickly from the air.

Consumers are advised to look for natural base materials that are free from harmful compounds.

Consumers shall prefer accurately labelled products, where manufacturers provide more exact information on VOC content than the legal obligation, consequently consumers can choose products with lower VOC.

### **Explanation for the scores**

All products started from 50 points

For the presence of isothiazolinone 1 point was deducted. The source of information was the product label.

For VOC content and formaldehyde emission we deducted the measured value times ten. The source of information was laboratory test.

For the final scores the VOC content was weighted 70%, formaldehyde emission 20% and isothiazolinone content 10%.

The test was supported by the *Ministry of Innovation and Technology consumer protection program, the European Union LIFE program and the Ministry of Agriculture (ENV GIE HU000622 Green&Safe LIFE-styles).*