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Understanding “VOC” in Paint: No Smell Does Not Necessarily Mean Non-Toxic When it Comes to Paints and Coatings

“VOC” does not mean harmful and “no VOC” does not mean harmless. The issue is the type of VOC, not how much VOC.

VOC stands for volatile organic compound, and it refers to certain chemical solvents that release gases into the air and contribute to indoor air pollution.

Types of VOC

There are several categories of VOC:

- Very VOC,
- Semi-VOC (SVOC), and
- Microbial VOC.

These are defined by their solvents' boiling point, not smell or toxicity. Just because something is odorless does not mean that there are no harmful VOC. To evaluate the possibility of harm, one must know exactly which ingredients are contained in a product.

Governments are now regulating against these unstable chemicals that are harmful to people and the environment. However the German Institute for Building Technology points out: “total VOC are only useful as an indicative value and results should be critically scrutinized”.

Not all VOC are the same. There is a large amount of research and scientific evidence to support the idea that there is a significant distinction, in terms of health impacts, between naturally occurring VOC such as orange oil, and synthetic VOC.

While most VOC evaporate rather quickly, the SVOC persist in the interior and are emitted only very slowly. These SVOC may also be taken up via skin contact, contaminated food or house dust.

The inconsistency in VOC testing and reporting means products such as water-based paints and varnishes can be labeled as VOC-free or low-VOC (or solvent-free or low-solvent), even though they can contain high levels of SVOC that can adversely affect the occupants' quality of living.

Not Just Numbers

One would think that relying solely on a numerical value should allow for easy comparison between products. However in practice, it is not so simple. The existence of “exempt” compounds and variable amounts of water (a solvent) in coatings may result in a significant difference between “actual VOC” and “regulatory VOC”. Furthermore, there is no consideration made between the origin of the VOC and its effect on indoor air quality.

In Australia, supporting documents such as the MSDS (Material Safety Data Sheets) are only required to list hazardous chemicals that individually make up more than 1% of the volume of the entire formula (unlike European guidelines). A paint company can put in several chemical masking agents and biocides, and not have to list any of them because individually they make up less than 1% of the volume. In combination, though, they can make up a large volume of the actual product.

Choosing Paints and Coatings

If you really want to use a paint that is truly healthier for you, look into products that have been used successfully by the chemically sensitive. It is not sufficient for manufacturers to simply state their ingredient list is a trade secret. Without

accurate information, especially a full declaration, it is nearly impossible to know how each component within a product will react with each other, let alone how it reacts with humans and the environment.

In addition, one would expect to have fewer health issues with substances found in nature than with synthetic chemicals. It is also worth noting that disposal of products manufactured from natural raw materials has less impact on the environment.

Many oils and paints are produced with water as the solvent. These require a multitude of auxiliary substances and preservatives to make them stable. As oil and water do not mix, strong emulsifiers are used to blend these substances together.

However, it also needs to be noted that some natural solvents can be highly aggressive and that, even though they are petroleum-based, highly purified isosalphates are a better alternative. They are recognized as one of the most harmless solvents known to man and are widely used in the medical, food and cosmetic industries.

Another factor to consider is the coverage rates of natural products, especially the penetrating oils. These are extremely economical. A low VOC product with poor coverage can actually emit more VOC per square meter than a higher VOC product that covers a larger area.

Type More Important Than Amount

For us mere mortals concerned for our health, the level of VOC in a container doesn't tell us much. It is the toxicity of the ingredients that is important to indoor air quality.

As mentioned "Free of VOC" does not mean that a product is completely safe for humans, animals or the environment. Even small quantities of solvents can be highly toxic. Today many of these are masked in such a way that they are converted into SVOC. They therefore avoid labeling requirements, but continue to be a source of potentially hazardous off-gassing, which is not assessed.

On the other hand, natural products classified as high VOC do not usually contain masking agents or SVOC and once dry they do not give off further gases.

Toxicity and VOC content are not automatically related. For example, oranges are not regulated, yet orange oil is a VOC. Low VOC does not inevitably mean a lower toxicity than a high VOC product or vice versa. Toxicity depends on the type of solvent, the percentage of the solvent in the wet product and how it influences the air that we breathe. It is not simply a number on a tin.

This information is aimed to provide food for thought when selecting products based on their VOC (Volatile Organic Compounds) information and why other important issues must also be considered when choosing paints and finishes.

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