



*In a time of drastic change it is the learners who inherit the future. The learned usually find themselves equipped to live in a world that no longer exists. – Eric Hoffer*



**Building Biology Institute**  
The science of healthy buildings



## Natural Finishes Fact Sheet

Surface finishes have always been at the heart of the building biology movement. Today, many finishing products are toxic to the environment, as well as to human health. It is most unfortunate when healthy building materials become unhealthy by the application of toxic finishes.

Natural building materials such as wood, clay or lime are highly recommended by building biology, as they have a very positive impact on indoor air quality (i.e. breathability, hygroscopicity, non-toxicity). But even such natural materials can easily lose their beneficial properties when coated with the wrong products.

There is a long list of symptoms caused by toxins added to finishes, especially pesticides and fungicides. Acute symptoms, such as irritation of the eyes and mucous membranes, headaches or vomiting can be easily related to a specific product and hopefully will subside after the exposure is eliminated. However, it is both complicated and challenging to investigate the sources of chronic poisoning, caused by low-level exposure over long periods of time.

Not all “natural” finishes are as safe as they claim to be. Essential oils, for example, are sometimes added in very high concentrations. As with many other natural substances such as salt, sugar, coffee or black tea, essential oils become poisonous at higher dosages. The risk associated with natural finishes is often a question of concentration, amount and frequency of usage. Compared to conventional finishes, however, natural finishes are usually a better choice.

The public demand for less toxic, environmentally-friendly and healthy alternatives has been growing. As a prime example, natural paint manufacturers have come a long way and offer competitive products, often with superior properties.

Finishing products usually consist of four major ingredients: binders, solvents, coloring agents and additives.

**Binders**, also referred to as **mediums**, are a type of adhesive, which binds the pigments together and attaches them to a surface. They not only have an impact on the visual appearance of the finish (e.g. flat or non-flat) but on the area of application as well (e.g. washable or waterproof).

**Solvents**, also referred to as **thinners**, effectively “thin” the mixture of binders and color pigments, improve its workability, and sometimes also increase its penetration depth. The simplest and most natural solvent is water, though it is only suitable for water-soluble binders.

**Pigments** lend color and opacity to a finish. In exterior applications, the pigment particles also protect wood from UV radiation by reflecting solar rays.

**Other additives** are various compounds which are added to improve the application properties of a given finish. One such group of additives includes so-called driers that are made from heavy metals.



The following recommendations are meant to offer guidance for the selection of healthy interior and exterior surface coatings:

- Paint as little as possible
- Prefer natural finishes
- Choose non-toxic finishes
- Insist on pleasant or no smell
- Maintain breathability of surfaces
- No static build-up
- Open surface porosity
- Low environmental impact
- Avoid glossy surfaces
- Skid-proof flooring

We are currently faced with a dazzling array of finishing products. It is a daunting task to make a choice, especially when considering how little information is revealed on the product labels and how much expert knowledge is required to decipher them. The quality of any given finish is determined by its chemical-physical properties, as well as the origin of its ingredients.