



HOW TO CHOOSE YOUR PAINT: NATURAL OR SYNTHETIC?

CHOOSING A PAINT

If, like some people, you are confused by the vast choice of paints available on the market, you should know that a certain number of criteria should be considered. First and foremost, your paint must be adapted to the type of room. The performance of the paint, its coverage, its cost, its composition, and its ecological impact, are also criteria to consider.

Here is a short guide to interior wall paints that will give you an overview of the different types of paints available on the market, their properties and application possibilities to help you see more clearly.

PAINT COMPOSITION

A paint is generally composed of:

- **Binders or resins:** they bind the components of the paint together and allow the mixture to set on the base when drying or solidifying.
- **Solvents (thinners):** they dissolve all the components to obtain a liquid formula easy to apply. They are said to be inorganic solvents such as water or organic solvents such as hydrocarbon-based solvents (e.g. white spirit, toluene, xylene...)
- **Pigments:** they give the paint the desired color.
- **Additives:** they improve the qualities of the mixture of the paint components (faster drying, better conservation...)
- **Fillers:** Substances generally of natural origin. They provide other specific properties such as: viscosity, thickness, stabilizing effect, etc. (ex: marble powder, silicas, talc, kaolin, etc.)

TYPES OF PAINTS

In the following information, paints are classified into 2 main categories and 2 sub-categories, each describing the composition of a paint. The term synthetic paints refers to common paints made from petrochemicals and the term natural paints refers to less common paints made from eco-friendly natural materials*.

Subcategories:

- **Solvent-phase** - indicates paints that thin with organic solvent, and
- **Water-phase** - indicates paints that are diluted with water.





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The table below is not exhaustive. It indicates the main categories of paints available on the market, and details their components and certain characteristics.

	Synthetic Paint: Latex, latex-acrylic, alkyd...		Natural Paint: Lime paint, clay paint, natural resin paint, silicate...	
	Solvent-phase	Water-phase	Solvent-phase	Water-phase
Categories	Alkyd paint	Acrylic paint/vinyl paint, latex paint	Natural oils	Lime-based paint, clay paint, natural resins, silicates...
Binder	Alkyd resin	Acrylic resin/vinyl resin	Natural resins, mineral binders (ex. clay...)	Natural oils, lime, silicate
Solvent (thinner)	Petroleum-based solvents	Water and 5-15% petroleum solvent	Often natural turpentine or essential citrus oils from renewable resources (reduced impact on the environment)	Water
Pigments	Of petrochemical or mineral origin, often sources of VOCs, some contain heavy metals (dark colors)		Of vegetable, animal or mineral origin	
Additives	Often toxic products such as biocides, fungicides, thickeners, etc.		Often no additives or, in some cases, additives from soft chemistry** and based on renewable and eco-compatible raw materials*. (e.g. essential oil as a preservative, food preservative, etc.)	





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<p>Nature of the ingredients</p>	<ul style="list-style-type: none"> - Almost all of them come from petrochemicals or so-called heavy chemicals. It should be noted that water-based products always contain solvents. - Not all ingredients are declared, and several chemical substances are not subject to any regulation. - High energy consumption in manufacturing. 		<ul style="list-style-type: none"> - Natural mineral or organic ingredients with a low transformation process. - All renewable and eco-compatible*. - Low energy consumption in manufacturing.
<p>Toxicity</p>	<ul style="list-style-type: none"> - Polluting and non-environmentally friendly chemicals - Even without VOCs, they contain solvents in varying quantities and several toxic additives - Strong and noxious odors - Use of solvent for tool cleaning - Slower drying 	<ul style="list-style-type: none"> - Cleaning of tools in water: → spillage of tiny, uncontained synthetic particles → pollution of waterways 	<ul style="list-style-type: none"> - Some paints contain natural citrus essential oils that can cause allergies in some people - Strong and noxious odors - Use of solvent for tool cleaning - Slower drying - None or very low odors
<p>Waste</p>	<p>Leftover paint should be disposed of in a hazardous waste landfill.</p>		<p>The dry remains are eco-compatible* and can be put in the household garbage. Many products are even compostable.</p>
<p>Advantages</p>	<ul style="list-style-type: none"> - High adhesion power - Wide range of colors - Highly resistant to dirt (glossier finishes) - Ready to use - Long shelf life for leftover paint 	<ul style="list-style-type: none"> - Dries quickly - Low odor - Wide range of colors - Can be diluted with water - Easy to apply - Ready to use - Long shelf life for leftover paint 	<ul style="list-style-type: none"> - Healthy and ecological - No petrochemical products - Natural renewable raw materials - Can be diluted with water - No toxic fumes (except citrus and turpentine) - All eco-compatible* or compostable - Diffusion capacity (breathable) - Antistatic - Antifungal, antiseptic (lime) - Hypoallergenic - Durable - Vibrant and natural colors - Authentic and very decorative effects - Rich reflection of light





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Disadvantages	<ul style="list-style-type: none"> - Their manufacture consumes large quantities of non-renewable raw materials and a lot of energy - (Potentially) dangerous components coming mainly from the petrochemical and heavy chemical industry creating toxic waste - Does not allow the walls to breathe, or does not breathe at all, forming a kind of "plastic" film <ul style="list-style-type: none"> → promote electrostatic charges → attract dust and mites 	<ul style="list-style-type: none"> - More methodical implementation and sometimes longer drying time - Can be tinted with natural pigments in powder or liquid (more limited choice of colors) - Leftover paint does not last as long
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Unfortunately, manufacturers are not obliged to disclose the list of ingredients in their products. However, the most serious manufacturers declare all ingredients transparently, others do so only partially and do not hesitate to disguise petrochemical ingredients under innocuous-looking names offering you pseudo-natural paints.

INTERIOR PAINTS ADAPTED FOR EACH TYPE OF SUPPORT

The table below is not exhaustive. It indicates the main categories of ready-to-use interior wall and ceiling paints available on the market and the substrates/backgrounds that are generally suitable for them. It is important to check with the supplier to see if a finish is compatible with the chosen substrate. Some brands may offer differences.

	Blank gypsum board, gypsum sheet	Concrete, masonry, plaster, lime, clay	Support painted with old water-based paint	Support painted with old paint in solvent phase	Spaces with very high humidity
Latex paints	☺	☺	☺	☹	☹
Acrylic paints	☺	☺	☺	☹	☹
Alkyd paints	☺	☹	☹	☺	☺
Silicate paints	☹	☺	☹	☹	☺
Lime paint	☺	☺	☹	☹	☺
Clay paint	☺	☺	☹	☹	☹
Natural resin paints	☺	☺	☺	☹	☹

The table above indicates the paint suitable for each type of substrate: ☺ = suitable, ☹ = unsuitable, ☹ = suitable under certain conditions (e.g. with prior treatment or under certain conditions). This assessment only concerns the suitability of the substrate and does not give any assessment from the point of view of environmental and health criteria.





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Tips & Tricks:

- Carefully read the instructions on the packaging and the technical data sheets, and if in doubt, ask the manufacturer or the point of sale for further information on the product. The application of the paint requires all the attention it deserves.
- To find out if a previously painted surface is covered with a water-borne or solvent-borne paint, do a simple test. Apply rubbing alcohol to a cloth and rub the surface. If the paint peels off, it is water-borne; if it remains intact, it is solvent-borne.

PAINTS OF YESTERDAY AND TODAY

The first paints used by man were made from natural materials: clay, lime, casein, natural oils, natural pigments. They were widely used until the Second World War when synthetic products of petrochemical origin appeared and largely dethroned natural paints. Modern synthetic coatings such as latex, acrylic, alkyds, or vinyl offer several advantages. However, they are sources of air (e.g. VOC), soil and water pollution with serious consequences on the environment and health.

A return to the use of natural paints has been taking place in recent years. This is encouraged by some manufacturers who have developed a new generation of paints based on natural materials eco-compatible * of high quality and adapted to modern construction.

TECHNICAL QUESTIONS

The quality and durability of a paint depends on:

- the choice of the type of paint
- the good preliminary preparation of the substrates
- the correct application of the paint

There is a wide variety of paints of different brands on the market, each with their own characteristics.

The application of natural paints is generally comparable to that of a common synthetic paint but may have some specific characteristics. Not containing ingredients of the so-called heavy chemistry to improve certain behaviors, they will require for example to be stirred from time to time during their applications, they will have longer drying times, etc. These characteristics do not constitute a major obstacle in themselves and, above all, avoid the use of toxic ingredients.

Do not hesitate to ask your paint dealer and read carefully the technical data sheets of the chosen paint.





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Tips & Tricks:

- To ensure a finish of quality, take special care in preparing your base/substrate. This step is just as important as the application of the finishing coats.
- Conventional washable synthetic paints are generally more resistant to dirt but have the disadvantage of being composed of various chemicals that are harmful to health and the environment. Most natural paints have a matte to velvety finish, which generally implies, like synthetic paints of the same finish, a lower resistance to dirt that varies according to the type of paint and brand. Several brands of natural paints offer products to increase this resistance such as waxes, natural binders, or Marseille soap (on lime only), etc.

HEALTH ASPECTS

Synthetic paints are composed of ingredients from petrochemicals and heavy chemicals. They contain toxic products that are released during and after their implementation. These fumes permeate fabrics and carpets in the home and remain in the air for several months. Synthetic paints in water phase contain much less solvents (5 to 15%) compared to synthetic paints in solvent phase and are to be preferred for this reason. Unfortunately, they are not completely free of toxic substances. Chemical additives, pigments containing VOCs, biocides and even heavy metals are often added to paints to prevent the growth of mold and bacteria to improve certain characteristics of the product.

Natural paints made from renewable and eco-compatible* raw materials, especially those in water phase, are non-toxic. Their diffusion capacity (breathability) is in most cases much higher than that of synthetic paints, which contributes to a healthy interior. They are antistatic, eliminate electrostatic charges and dust attraction and therefore reduce the development of dust mites. Thus, the high PH of limewash paint is a natural-based (non-toxic) anti-mould system suitable for wet areas such as bathrooms, without the use of (toxic) anti-fungal chemicals.

Some natural paints can be offered in powder form. They are without preservatives and must be mixed with water by the applicator. The transport of this type of packaging requires less energy by avoiding the unnecessary displacement of liters of water.





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ENVIRONMENTAL ASPECTS

Synthetic paints and the solvents they contain have a harmful impact on both health and the environment. Although water-based synthetic paints (e.g. latex, acrylic) are less toxic and polluting than solvent-based synthetic paints, they contain tiny synthetic particles that are not retained by any water treatment plant and pollute waterways. Even if these products are water dilutable, it is important to remember that they are essentially made of ingredients from the petrochemical industry.

Recycling old synthetic paints helps reduce hazardous waste, and their processing is said to require less energy consumption than the manufacture of current non-recycled paints. They contain little or no VOCs, but there are concerns about the health and environmental impact of other unmentioned chemicals in recycled paints. The latter must in any case be disposed of at the hazardous materials landfill.

The ingredients of natural paints are largely renewable. They reduce the environmental impact throughout their life cycle, from the extraction of raw materials to their end-of-life treatment. There is a wide range of different types of vegetable or mineral-based paints: silicate-based paint, lime-based paint, milk-based paint, clay-based paint, natural resins, natural oils, etc. Depending on the manufacturer, such paints contain either products that are not very toxic for the environment and health or products that do not contain any hazardous materials. Unlike conventional paints, the dry residues of most natural paints can be disposed of in household waste or even composted.

ECONOMIC ASPECTS

More expensive paints are sometimes stronger in charge, and thus have a better coverage. They have a higher yield, allowing more square footage to be covered and possibly fewer coats to be applied. When comparing prices of paints, it is important to consider the yield of the paint and not the content (liters) of the can.

First, calculate the surface to be painted and then refer to the paint yield indicated on the label. You can then calculate the amount of paint needed for each brand, and compare them. Note that all products express the yield for one coat of paint. Generally, two coats are required. The yield may vary depending on how you paint, but especially if your support is porous or structured (plastered or brick wall for example).

Always calculate a little more material to easily perform touch-ups or fittings and to have enough left over for possible repairs. Be aware that the amateur painter often tends to use more materials than necessary. Consider that it is important to prepare your supports well. In most cases, a primer should be applied first to ensure a good finish.

Be sure to calculate the quantity and avoid buying too much paint unnecessarily. Powder paints allow you to mix only the quantities you need.





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DIFFERENCES BETWEEN "ECOLOGICAL" PAINTS

The current policy to reduce VOC emissions aims to limit the development of solvent-based paints in favor of water-based paints such as latex, acrylics, etc.

In general, low-VOC or VOC-free synthetic paints are now less toxic but are still mostly made of petrochemical ingredients and contain other materials that are (potentially) hazardous to health and the environment.

Most of the manufacturers do not give the complete list of the ingredients of their product neither on the packaging, nor on the data sheet. Therefore, the consumer cannot know the exact composition of the product purchased.

The most consistent manufacturers of natural paints voluntarily indicate the full list of ingredients on the packaging. They do not use petrochemical and heavy chemical ingredients. They avoid hazardous materials. They offer eco-compatible* products, even compostable.

When in doubt, ask your local retailer for more information or do a search on the internet.

COST

A natural paint is more expensive when compared to other quality paints. It will not cost more when compared to a higher quality synthetic paint that offers VOC-free tinting. Environmentally friendly* natural paints also offer great health value to the consumer. It should be noted that in general, the darker colors of natural paints increase the price because they use natural pigments.

VOC?

Volatile organic compounds are household chemical pollutants, they are greenhouse gases. Formaldehyde, benzene, toluene, alcohols, organic solvents, and combustible gases (propane, etc.) are the most common VOCs. They can cause dizziness, nausea, fatigue, and many other symptoms. They are found in furniture, chipboard, paints, and household products. They should therefore be limited or even banned from our living spaces.

Did you know that there are two types of VOCs?

On a strictly chemical level, volatile organic compounds are composed of carbon and hydrogen that can easily be found in gaseous form in the atmosphere.





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Anthropogenic VOCs: from refining, transportation, industrial solvents, chemical processes, agricultural waste, etc.

Natural VOCs: from emissions by plants, forests, fermentations, etc.

It should be noted that both can be harmful to your health.

According to Environment Canada, anthropogenic sources of VOCs in highly populated and industrial areas remain the primary cause of air quality problems.

Naturally occurring VOCs have always existed and are an integral part of life. Our planet has lived with them for millions of years, many of them being naturally biodegraded by bacteria, fungi, plants, UV light or ozone. It is human activity and moreover anthropogenic VOCs that have upset this balance.

More and more people in the ecological and eco-building community are pointing the finger at industry. The latter seems to have launched a zero VOC war drawing the public's attention to one component without taking into consideration the harmfulness or biodegradability of these VOCs and especially by wanting to make us forget all the other harmful components in the composition of these products. What the industry is trying to make us believe is that if your paint has no VOCs then it is ecological!

ECOLOGICAL CERTIFICATIONS

There are several eco-labels in the paint industry. Generally speaking, certified paints are more environmentally friendly than others, even if they are not necessarily free of certain synthetic petrochemical products. However, the requirements of a specific label must be independently verified by a third party.

In addition to ecolabels, national regulations also establish criteria that limit the toxicity of products placed on the market. These criteria are more or less severe depending on the country.

Some manufacturers of natural paints do not wish to obtain certifications because their product does not contain VOCs or any other pollutant. Some say they refuse to participate in a system that they believe manipulates public opinion.

On the other hand, it should be noted that an essential problem remains at the base for these small companies: the financial aspect. Ecolabel programs are voluntary, but they are not free. Also, it is both a lot of time and money that manufacturers invest in order to obtain certifications. The option is therefore favorable to large manufacturers who often limit themselves to one or a few products that meet the specifications of a given ecolabel. It is a difficult option for small manufacturers, some of whom could be certified for all their products.





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CONCLUSION

There are many brands and types of paint on the market. Each of them has its own composition, so it is impossible to compare them all. A wise choice of paint must first take into consideration the type of room and the substrate to which the paint will be applied. Be sure to prepare the substrate with products that are compatible with both the substrate material and the chosen finish. To save your health and the environment, choose environmentally friendly paints and finishing materials made primarily from renewable and inexhaustible mineral or vegetable raw materials. These finishing products contain no solvents, consume very little energy in their manufacture and are eco-compatible*.

Lexicon:

*Ecocompatible: A discharge is said to be ecocompatible when its return to the natural environment is acceptable. An ecocompatible discharge does not lead to foreseeable or identifiable dysfunctions or to significant variations in its ecological balance.

**Soft chemistry: A recent discipline that promotes the most harmless use of biogenic, renewable and mineral raw materials transformed in an environmentally friendly manner and returned to nature at the end of their life.

Sources and more information:

Legislation in Canada:

<http://www.ec.gc.ca/cov-voc/default.asp?lang=Fr&n=59828567-1>

<http://www.ec.gc.ca/cov-voc/default.asp?lang=Fr&n=79D4AE5C-1>

Government of Quebec VOC definition (in French):

<http://www.mddep.gouv.qc.ca/air/cov/index.htm>

Legislation in Europe:

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3A128029b>

European Ecolabel:

<http://ec.europa.eu/environment/ecolabel/>

Brussels Environment (in French):

<http://www.bruxellesenvironnement.be>

Ecoconso (in French):

<http://www.ecoconso.be>

Écohabitation (in French):

<http://www.ecohabitation.com/annuaire/>

