

The following article was published on www.proof.co.uk who are also known as "What doctors don't tell you". They are a very respectable group who do independent tests on eco products and publish the results.

In this test of emulsion wall paints, AURO came out with the best result.

Chemical-free paints

Paint manufacturers argue they have to add a cocktail of chemicals to their products - but for many they are a hazard to our health. Small independent manufacturers claim that chemicals such as VOCs aren't necessary at all, but do their paints measure up?

Most people can't stand the smell of paint, and for some the fumes can cause short-term headaches and nausea. But few realise that paint fumes can also lead to far more serious long-term health problems. The culprit is a range of chemicals in paints that are collectively known as Volatile Organic Compounds (VOCs), which manufacturers maintain are necessary in order to make the paint.

But a group of small, independent paint manufacturers claim otherwise. They are making paints that have little or no VOCs. But do they measure up in terms of price, quality, smell, coverage and durability?

On the face of it, there should be no need for the independent 'alternative' paint manufacturer. The major paint conglomerates have done a great deal in recent years to make their products safer. The first thing they did, years ago, was to remove the lead in their paints, after it had been shown to cause brain damage. More recently, major European manufacturers, such as ICI (Dulux), Akzo Nobel (Sadolin, Sandtex, Crown, Berger) and Ronseal have all cut down on VOC content.

Despite this, EU officials have been less than impressed and, in 2004, issued a new directive that limits the VOC content. It finally became law in the UK in November 2005.

So what's the problem with VOCs?

VOCs - 'volatile' means that the chemicals easily evaporate and can get into the air at normal room temperature, and 'organic' means that it contains carbon - are put into paint to improve qualities like drying times, spreadability and colour, and some VOCs are fungicides and pesticides.

There are hundreds of different VOCs, but a typical paint might contain a cocktail of benzene, toluene, methylene chloride, methyl chloroform, ethylene glycol, vinyl chloride and mercury. Solvent-based or 'oil' paints contain considerably more VOCs than water-based emulsion paints, but even emulsions are not totally VOC-free. Solvent-based paints typically contain 30-70 per cent VOCs by weight while typical water-based paints contain about 6 per cent. Colour is also important - by and large, the lighter the colour, the fewer the VOCs.

Tips for Healthy Indoor Painting

- Schedule painting for dry periods in the summer, when you can leave windows open for ventilation (2-3 days)
- Don't use exterior paints indoors
- Take frequent fresh air breaks while painting;
- Watch out for tell-tale symptoms like watery eyes, headache, dizziness, or breathing problems.

The US Environmental Protection Agency, an official body not known for over-hyping hazards, has found that there may be hundreds of individual VOCs in an indoor air sample. Some of these will come from paint, particularly new paint, which can “offgas” VOCs for up to two years after painting. Most offgassing, of course, occurs in the first few days after painting, while the paint is “fresh”.

There are two main problems with VOCs - human health, and the health of the planet. For most people, the worst they will suffer from the outgassing of VOCs are headaches and perhaps some dizziness or drowsiness. But it's not uncommon for VOCs also to irritate the eyes, nose and sinuses. Other more serious side-effects can be shortness of breath, nausea and depression. Further up the hazard scale, VOCs have been known to affect the nervous system, and cause blood, liver and kidney diseases. There is some evidence they may even cause cancer if the exposure is prolonged. Professional painters, for example, have a 10 per cent overall increased risk of cancer, but much higher risk rates of specific cancers such as leukemia (87 per cent), cancer of the liver (43 per cent), oesophagus (32 per cent), and lung (30 per cent) [Cancer Detect Prev. 1998;22(6):533-9].

Children are also more susceptible than adults to VOCs, according to a recent US symposium. “Children are still developing physically and they have higher breathing rates than adults, resulting in higher relative doses of pollutants than adults experience when exposed to the same air concentrations,” say these experts. “Child-related concerns include the rising rates of asthma and frequent problems with poor air quality in schools (due to) ...elevated levels of formaldehyde and other VOCs” [Indoor Air Quality: Risk Reduction in the 21st Century California Environmental Protection Agency Symposium May 3-4, 2000].

At work, VOCs are believed to be a major contributor to the “sick building syndrome”. At home, the ever-increasing air-tightness of new housing is making the VOC problem worse. A recent survey of people who had bought newly-built houses found a significant correlation between the amount of VOCs and throat, respiratory and eye symptoms, even at “relatively low” VOC levels. [Int Arch Occup Environ Health. 2004 Oct;77(7):461-70].

Of course, if you're unlucky enough to suffer from asthma or chemical sensitivity, VOCs can be some of the most noxious pollutants in your personal environment. Even ventilating the room while the paint dries won't help much. “Some people are particularly sensitive to the low levels of VOCs that are given off from paint, long after it has been applied,” says environmental architect Pat Borer, co-author of *The Whole House Book: ecological building design and materials* [Cat Publications, 2005]

As for the planetary environment, it's only recently been appreciated just how damaging VOCs can be. When they're at ground level, VOCs react with sunlight and oxygen to form a chemical smog. This can not only cause respiratory problems, but it also damages plant life.

The worst example is in Los Angeles, but every major urban area has the problem to some degree. In cities, of course, the main culprits are not paints but car exhausts, but nevertheless paints do contribute to some extent - in fact, about 5 per cent of environmental VOCs are from paint, according to a recent European Report [Conseil Europeens de l'Industrie des Peintures, des Encres, d'Imprimerie et des Couleurs d'Art]

VOCs' worst effects, however, are in the atmosphere, where they not only contribute to the greenhouse effect, but also damage the earth's protective ozone layer.

The third big environmental problem comes from half-used paint tins. These are often dumped into landfill sites along with the rest of our rubbish, contaminating both the ground and ground water.

Not banned, just reduced

Typical VOC content of ordinary paint

Dulux Emulsion "Low VOC"

up to 8% VOCs

Dulux Gloss

up to 50% VOCs

Sadolin Wood Stains

up to 25% VOCs

Crown Colorfects

up to 8% VOCs

For a host of good reasons, therefore, VOCs are bad news, so you'd imagine they would have been banned by now, or at least phased out. Although it's now been realised that paints don't actually need VOCs, paint manufacturers have only been required to reduce the VOC content, not eliminate VOCs entirely. The latest UK legislation still permits up to 700 gms of VOCs per litre in some indoor paint finishes.[The Volatile Organic Compounds in Paints, Varnishes and Vehicle Refinishing Products Regulations 2005]. In the USA, 350 gms/litre is the maximum permissible level.

So the reality is that most paints on sale in Britain contain VOCs. The best you can expect to find from conventional manufacturers are paints marked "low-VOC" or "low odour", but even these contain appreciable amounts [see box].

The other problem with conventional paints is that, in seeking to reduce VOCs, some manufacturers have substituted them for other chemicals which are just as toxic, but which haven't come to the attention of the authorities yet. Water-based gloss paint is a good example. In order to compensate for the loss of VOCs, manufacturers have added a cocktail of "neutralising agents", "auxiliary dilutants", and preservatives. Swedish authorities have warned that, in order to make low VOC water-based gloss paint harmless before entering the sewage system, the paint needs to be diluted in 40 million parts of water. "While the levels of VOCs might well be reduced," says Nicola Brooks of Ethical Consumer magazine, "paint still contains chemicals whose production is known to be polluting, and massively dependent on non-renewable resources."

A breath of fresh air

Fortunately, there are a number of small-scale paint manufacturers who have recognised the dangers of VOCs, and produce a range of safe, eco-friendly products - almost literally offering a breath of fresh air.

Totally non-VOC paints are made from such apparently bizarre ingredients as safflower oil, oranges and even milk - ingredients you might put on your skin, not your walls. A growing band of small, independent manufacturers across Europe and the USA are making paints with a host of traditional non-toxic ingredients, often including the natural dyes and pigments used by artists centuries ago. The downside is they offer a more limited choice of colours than conventional paints, but that's outweighed by their unusual "natural" look.

Because they don't have anything like the advertising budgets of Dulux or Crown, these companies are still fairly invisible to the average consumer. Nevertheless there are quite a few companies out there, some of which are actually manufactured in the UK. We have surveyed five of the leading ones.

In alphabetical order, they are:

Auro - Based in Gloucestershire, Auro has spent 3 years and "some millions of Euros" formulating environmentally friendly paints. They claim to have the highest standards in the industry, with price being a lesser consideration "Auro's uncompromising stance does make our products more costly, but, for those prepared to stand on their principles, this is a worthwhile price to pay", they say.

Website: www.auro.co.uk. Tel: 01452 772 020

Earthborn - A German company that adopts a more pragmatic approach to their ingredients than their rivals, occasionally using "zero or very low" VOC petrochemical derivatives when "the alternative can be more harmful to the environment or the health of the user". So they're not always 100 per cent VOC-free.

Website: www.earthbornpaints.co.uk. Tel: 01928 734 171

Ecos - Another British company, manufacturing in Lancashire. They claim their range is "the world's best-selling organic paint, with all the performance characteristics of modern paints".

Website: www.ecospaints.com. Tel: 01524 852 371

Green Paints - Founded by a renegade industrial chemist in 1986, this is probably Britain's oldest natural paint company. "All our products have been developed to provide durability that compares with that of conventional paints without the same hazards," they say. "When it comes to environmentally friendly coatings Green Paints really does set the standard".

Website: www.greenpaints.net. Tel: 01507 327 362

Livos - A German company with "30 years experience of manufacturing paints based on a selection of 150 natural materials, chosen not only for their performance, but also for the fact that they are safe to use". Livos even make a natural organic paint stripper.

Website: www.livos.co.uk. Tel: 01795 530 130 (UK supplier)

The Consumer Test

These companies' environmental credentials are obviously excellent. However, leaving sentiment aside, the real question is: can they compete against the big boys in terms of paint quality or value for money? After all, natural paints can be considerably more expensive than normal paint. Are they worth it? Pat Borer is in no doubt: "Natural paints perform much better and generally last longer than ordinary paints," he says. "If you look in the longer term, they do offer good value for money."

We bought a selection of each of these companies' wall paints - both white and coloured - and gave them to a panel of seven ordinary consumers. None was a paint expert; each simply had average DIY experience. Working singly, the panel members tested each manufacturer's paints for six qualities: colour, coverage, texture, quality of finish, odour in the pot, and odour on the wall.

Key to ratings:

aaaaa	Excellent
aaaa	Very Good
aaa	Good
aa	Fair
a	Poor

Auro

Rating: aaaaa

Price £31- £37 for 5 litres

Quite a hit with our panellists, with most of them giving the paints top or near top rating on all but one measure. The major downside was the smell, with about 50 per cent of the panel complaining about the odour in the pot - although most reported it wasn't so bad once the paint was actually on the wall. Auro helpfully give a full ingredients list on the tin - useful for people suffering from chemical sensitivity, who probably already know what they're allergic to. Ingredients range from linseed and eucalyptus oil to cellulose, chalk and clay, so there's apparently nothing in any of their paints to harm a flea (although fleas might not like the rosemary oil much).

Ecos

Price: £25 - £33 for 5 litres

Rating aaaa

Ecos claim their paints are the equal of conventional solvent-based paint, and certainly our panel gave them high marks on most characteristics. Reaction to the smell was mixed, though: two testers described the odour from the tin as "awful", but others thought it "neutral". "not too strong", and with a "quite pleasant yogurty smell". Once on the wall, however, the smell disappeared. One panellist thought the colours "a bit wishy-washy", but most rated the colours good to excellent. However, the list of contents might be thought a little lacking in information, particularly since some of the ingredients are classified as "synthetic binders". Not 100 per cent natural ingredients, then.

Earthborn

Price: £32 - £36 for 5 litres

Rating aaa

Received relatively high marks for lack of odour - "neutral smell", "low odour" were some comments. The panel generally liked the colour, coverage, texture and finish - "smooth finish", said one, although another thought it "quite sticky". Earthborn's ingredients list is shorter than most, and is honest enough to admit it contains a "synthetic preservative" - although only 0.1 per cent. Nevertheless, even such a tiny amount may cause problems for people with chemical sensitivities.

Livos

Price £28 for 5 litres. Colouring paste: £6.77 per 0.375 litres

Rating aaa

Despite their price and pedigree, these paints were not an overwhelming hit with our panel. Although most liked the colours, there was a vociferous dissenting minority - "not great colours", "really rancid - if painted my room in these colours, I would be so depressed". A few disliked the odour in the pot. On all other measures, however, the paints scored fair to excellent. Livos offer a pretty detailed list of ingredients, which will appeal to people with chemical sensitivities. Not quite as user-friendly as most paints, as you have to mix the colours yourself, thus making matching difficult.

Green Paints

Price : £32.60 for 5 litres

Rating aa

Our panel had a generally unfavourable response to this range, with the paints on average scoring no more than "fair". The colours in particular were disliked by most testers - particularly the cream, which was described as "a little mucky", and "like bile". Odour in the pot also got adverse comments - "really strong", "smells like ordinary oil paints". Green Paints are somewhat unusual in having less clay content than most. The major ingredient appears to be chalk, with "soya-based resin" from soya beans as the binding agent. Their paints also contain an unnamed preservative.