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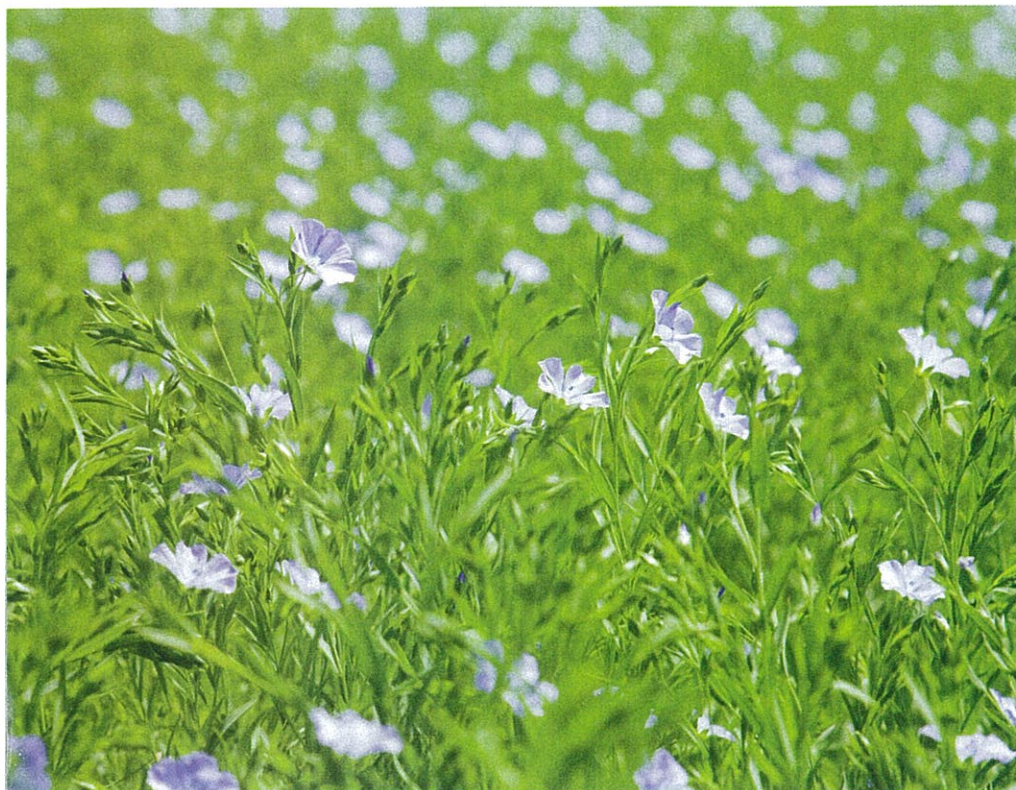
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# Colour my world

YOU CAN'T RENOVATE A PROPERTY WITHOUT PAINT. KEVIN DAVIES TAKES A LOOK AT THE REVIVAL OF LINSEED OIL IN PAINT-MAKING



From this to this: seeds from the flax plant can be made into oil and paint, which will transform this tired wooden door

Whether you're renovating your French property wholesale, or simply want to stamp your identity on it, at some point your thoughts will turn to paint. Before you rush off to buy, say, acrylic or alkyd paint, it is worth considering the merits of an ancient paint that is making a comeback.

Linseed oil-based paints have been around for centuries. What's more, they are non-toxic, durable and eco-friendly.

The cultivation of the humble flax plant dates back several thousands of years. Flax seeds and woven cloth have been found in Egyptian tombs. It has been used for millennia in all manner of ways.

Today you may have lino covering the kitchen floor – it's made from solidified linseed oil (linoxyn) – or have fed the birds some flax seed or taken a drop yourself for nutritional

purposes (flax contains the highest level of omega-3 fatty acids among all vegetable oils). You may have applied linseed oil to protect your willow cricket bat and, if you have, you will have done this because everyone knows linseed oil is good for wood.

Oil has been pressed from the seed of this versatile and pretty little plant, and has been used for thousands of years. In France, linseed oil is also the traditional finish for earthenware floor tiles or *les tomnettes anciennes*. The chemistry may not have been understood, as it is today, but its performance as a protective and extremely durable coating is not disputed.

## GETTING TECHNICAL

There are two basic types of flax – oilseed and spinning flax. Oilseed flax grows with shorter fibres and produces seeds that are rich in oil. Spinning flax has long fibres,

but with less oil in its seeds. Linseed oil (or flax seed oil) is referred to as a 'drying oil', meaning the initial material is liquid but after a period of exposure to air, it hardens to a tough, solid film. The 'drying' process – there is no evaporation – is the result of an oxidative reaction where oxygen attacks the hydrocarbon chain and the oil polymerises, forming long chain-like molecules.

As time passes, the polymer chains cross-link, resulting in a vast polymer network. The result is an aged material that is stable and rigid but remains somewhat elastic. Most applications of linseed oil exploit these drying properties.

Linseed oil molecules are also small and, aided by an expansion in volume of around 10% during drying, it offers excellent penetration into wood pores, both visible and microscopic but without expanding the wood itself.

Linseed oil is also hydrophobic; its molecules repel water. Droplets of water will form on the linseed oil film much like morning dew on grass or on the surface of a leaf.

We can begin to appreciate how linseed oil can protect not only our cricket bat but most surfaces exposed to the elements.

In due course, colour pigments were 'suspended' in the linseed oil and it became the preferred supporting medium (binder) for making oil-based paint.

Linseed oil paints have been used in Europe since the 13th century and were widely adopted as an artistic medium during the Renaissance period. Pigments are essentially 'fillers' that serve to thicken the film, increase the volume of paint and provide colour. They also affect drying time and durability. Natural granular solids were typically



Paints made from linseed oil are starting to make a comeback onto ironmongers' shelves

used, including clays, oxides and carbon. With these pigments, a palette of natural earth colours can be achieved including sienna, ochre and umber. These traditional linseed oil paints have lasted centuries and continue to protect exterior timbers, windows, doors and ironmongery. Paint failure was unheard of.

### STING IN THE TALE

All was well... aside from some poisonous pigments that is. Various poisonous minerals and metals have been added to paint over the years. Emerald green is a pigment based on arsenic while vermilion is based on mercury. These colours were favoured by the Impressionist painters.

Cezanne developed severe diabetes (due to arsenic poisoning), Monet went blind and Van Gogh suffered neurological disorders.

These illnesses may also, in

part, be attributed to use of other commonly used substances including liquor and absinthe, and solvents such as turpentine and lead pigment.

The addition of lead as a pigment improved paint performance and increased durability; it is 'drier', resisting moisture and retaining the paint's appearance. Lead was used in high levels in paint between the 1930s and mid-1950s, and in significant quantities up to the early 1960s. However, lead is poisonous so European Union legislation banned the sale of lead-based paint to the public from the early 1990s.

In France a lead survey, referred to as a *diagnostic*

*plomb: constat de risqué d'exposition au plomb* (CREP), is obligatory if selling or letting property constructed before 1 Jan 1949. More information can be found at [www.afnor.org](http://www.afnor.org) (search for *peintures au plomb*) or [www.defra.gov.uk](http://www.defra.gov.uk) (search for lead paint).

### HEALTHY OPTIONS

Since the 1940s, the paint industry moved away from traditional (linseed) paint production in favour of chemical, petroleum and solvent-based paints (alkyd and acrylic).

Paint manufacture became a high-tech industrial-scale process that continues to this day; think large carbon footprint! Vast quantities of

**TOP TIP!**  
Linseed oil paints can also be used on walls and ceilings where you would commonly use an emulsion. Check the manufacturer's instructions

paint could be made at relatively little expense, thanks to the use of fossil fuels.

However we are now in a period of green enlightenment and I would like to think that it's unlikely we would have chosen the petrochemical and paint industry giants' solutions if they were proposed today.

With alkyd paint – artificial oil paint – linseed oil is replaced with synthetic alkyd resin oil, which is then dissolved in petrochemical solvent. These solvents evaporate as the paint dries and they contain high levels of volatile organic compounds (VOCs), which are harmful; exposure to high concentrations have

CEZANNE DEVELOPED SEVERE DIABETES, MONET WENT BLIND AND VAN GOGH SUFFERED NEUROLOGICAL DISORDERS



Paint has been used to decorate our homes for hundreds of years

been the cause of ill health among painters for decades.

Most of us will, at some time, have experienced the general narcotic effects of using solvents – headaches, drowsiness, dizziness and nausea. The dangers of long-term exposure to solvents can be much more serious. The World Health Organisation reports a 20% increase of cancers and in Denmark a chronic cerebral syndrome is referred to as 'painter's dementia'.

It is not surprising then that there has been a demand to reduce the amount of VOCs emitted from many products and this includes oil paints, varnishes and wood stains. In the European Union this has resulted in directive

2004/42/EC which came into effect on 1 January 2010.

All manufactured decorative coatings have to comply with new VOC limits. There are many who believe that these limits are still too high. The VOC limit for solvent-based oil paint for wood is 300g/litre whereas traditional linseed paint will contain less than 18g/litre.

Acrylic or latex paint (plastic dispersion) is a fast-drying paint containing pigment suspended in an acrylic polymer emulsion. A rapid

drying time enables a painter to apply two or three coats in a day and move onto the next job; this is very advantageous.

These paints are often sold as environmentally friendly because the solvent used is water. VOC emissions are low and the painter will suffer no ill-effects. The downside, and it's a big one, is that acrylic polymers are derived from petroleum products; it's plastic.

Acrylic paint consists of polymethyl methacrylate (PMMA) suspended in water and you need 2kg of petroleum to make 1kg of PMMA. In my opinion, paint derived from non-renewable fossil fuels cannot be eco, green or environmentally friendly.

### A PAINT COMPARISON

When renovating your French property, cost will be an important consideration. So, if we can put aside for one moment the image of oil refineries and painters suffering the worst effects of toxic paint fumes, let us consider cost, performance and durability.

Acrylic and alkyd paints have a dry matter content of around 40% and 55% respectively; the remainder is solvents and these evaporate as the paint dries. So, about half the 'paint' in the pot actually goes into the atmosphere, not on the surface being painted. By contrast linseed paint 'dries' through oxidation and the dry matter content is therefore 100%.

Coverage rates for the alkyd

and acrylic paints are between 10% and 40% lower than for linseed paint. Lower coverage rates combined with the necessity to apply primers and undercoats result in higher costs for the application of the modern paint system and this is without considering the additional labour costs or wastage.

If a higher overall paint cost corresponded to an increased longevity this would be acceptable. However, this is not the case. The modern paints have a claimed life expectancy of around six years and this is less than half that of the linseed oil paint.

Why is this? The answer lies in our earlier explanations. Modern paints have been unable to successfully replicate the properties of linseed oil. Modern paint does not penetrate, breathe or remain elastic as linseed oil paint can and has proven to do so for generations. So our modern paints don't last very long, are rarely green, but are expensive. We have paid a high price for paint failure.

We are fortunate then that, although in decline since the 1960s, the linseed oil pressing industry did not completely vanish with the advent of modern paints. Today, linseed acreage is actually on the increase and raw cold-pressed linseed oil is being produced in northern Europe, Canada and in the United States.

Furthermore, a combination of traditional European skill, ancient wisdom, modern production techniques and cooperation with farmers, has enabled the development of a new generation of linseed oil paints that are long-lasting, ecologically friendly and free of solvents or poisonous pigments.

As they say in Sweden, 'we have to look back if we are to see the future' and we must therefore 'rediscover the ancient wisdom'. ■

MODERN  
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#### Typical examples for exterior wood paint specified for windows, shutters and doors

Paint group	Dry matter content	Coverage (m <sup>2</sup> /litre)	Surface penetration	Drying time (top coat)	Longevity	Cost (1m <sup>2</sup> all coats)	Life (1m <sup>2</sup> per year)
Alkyd oil <sup>1</sup> (artificial oil)	± 55%	≤18 (top coat)	No penetration	16 hours	±6 years	£5.49	£0.92
Acrylic <sup>2</sup> (plastic)	± 40%	≤12 (top coat)	No penetration	4-6 hours	4-6 years	£8.12	£1.62
Linseed oil <sup>3</sup>	100%	≤20 (top coat)	Penetration	24 hours	±15 years	£5.03	£0.34

#### Notes

- Quality UK branded paint – one coat primer, two coats undercoat, two coats top coat gloss
  - Quality UK branded paint – two coats primer/ undercoat, two coats top coat eggshell (micro-porous)
  - Swedish paint – three coats linseed oil paint, after 6 – 8 years apply one coat boiled linseed oil
- Alkyd & acrylic paint – failure occurs and application process is repeated after approximately six years
  - Linseed paint – oxidation process, apply one additional coat of paint after approximately 15 years

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Recommended linseed paints:  
[www.peintureauthentique.fr](http://www.peintureauthentique.fr)  
[www.allbackpaint.com](http://www.allbackpaint.com)  
[www.holkhamlinseedpaints.co.uk](http://www.holkhamlinseedpaints.co.uk)