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Decorative Coatings producers contribute to sustainable development

The successful lowering of VOC contents in decorative paints

A CEPE opinion on efforts and results related to the complying with the Product Directive 2004/42/EC

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Executive summary

Achieving compliance with the stringent VOC limits of the Product Directive has been a major effort for the actors in the supply chain of Decorative Coatings. It involved the development of new resin technologies, new decorative paints and new ways of applying paint by the professional painters. Paint producers had to also absorb substantial costs for the new labelling according to this directive. By 2011, a complete new range of lower VOC content products has resulted from this legislation. The industry is proud to have achieved this. Lowering the VOCs into the air is for sure a good contribution to sustainability. At the same time CEPE also likes to remark that further reductions of the VOC levels in the Decorative paints would cause problems like quality loss, reduced application conditions and reduced customer choice. The paint industry is appreciative of the fact that the Product Directive ensures a level playing field across Europe when it comes to VOC levels per product category, however CEPE believes that enforcement at the national level could be improved and would therewith also contribute to further reductions in VOC.

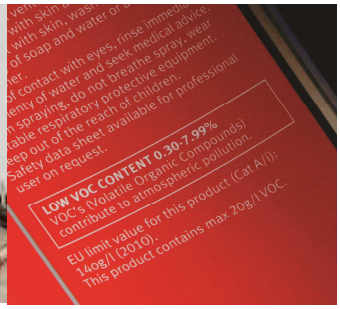
The cause for a regulation of VOC in deco paints

With the aim to reduce atmospheric ozone levels, the European Union has issued two regulations that restrict the use of volatile organic compounds (VOCs). The first was adopted in 1999 being the Solvent Emission Directive (SED; EC 1999/13) in which the emissions of VOCs from an installation (be it paint application or others) were obliged to remain within certain limits.

Realizing that a large portion of VOCs were in use in the Decorative paints sector, the European Commission in consultation with CEPE looked at ways to reduce the VOCs that originated from paints that were applied on an object at a fixed point ('in situ'). Rather than limiting the quantity of emissions as with installations, here the delivery form of the paint had to remain within limits of maximum VOC contents. This resulted in the adoption of the Product Directive (EC 2004/42).

The product directive was adopted into 2004 and came into force in 2007. It set limits for the main categories of Deco coatings valid from 1 January, 2007 and then more stringent limits for these categories from the year 2010 onwards.

Remark: the Product Directive also sets limits for vehicle refinishes; these products are not part of this paper.



Compliance without compromising quality and product choice

This motto formed the assignment of the CEPE members when around the year 2000 they became aware of the intended maximum levels of VOCs in DECO paints. VOCs are incorporated into paints for several functional reasons. They ensure the coatings can be applied by having the correct viscosity and that they have good drying properties. They are either added to a paint formulation or they come already incorporated in the ingredients of a paint (i.e. binders and additives etc.).

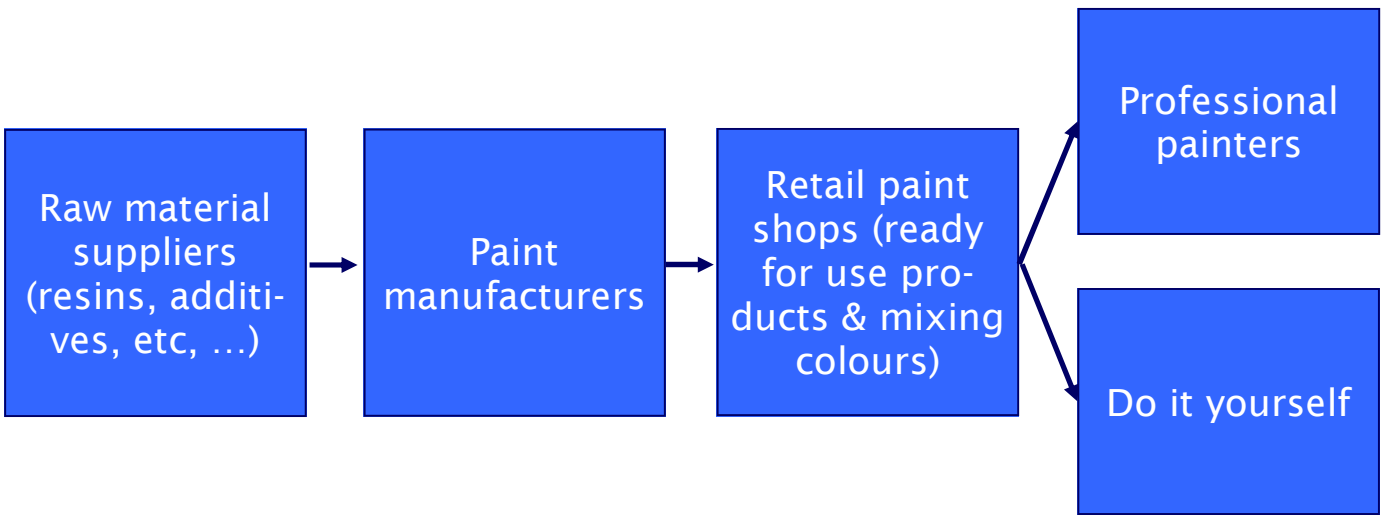
Ingredients and paint manufacturing

Decorative Paints and Varnishes comprise of resins, pigments and additives which are carried in a liquid phase. The liquid phase (VOCs or water) evaporates after application leaving a film on the substrate. The appearance and properties of the resulting coating film depend critically upon the formulation of the paint – which is designed to deliver films that meet specific market segment needs. Users of Decorative Paints and Varnishes apply them to the desired substrate under a wide variety of conditions (temperature, humidity etc.). It is essential that the desired appearance and performance of a dried DECO paint can be achieved under a broad range of these application conditions - so that the desired quality can be achieved every time the product is used.

Changing the VOC content meant nothing short of changing the delicate balance of the mixture of characteristics that comprise a paint.

The actors in the supply-chain.

As paint manufacturing is mainly a mixing of the carefully evaluated ingredients as they are available on the market, the paint manufacturers had to turn to their suppliers to pass on a part of the challenge.



R&D programs at these suppliers had to start to meet the challenge of reducing these critical VOC components without compromising the ease of applicability and of the ultimate properties of the dried paint. As the resin (or binder) in a decorative paint represents the largest component and is most often dissolved in VOCs, the main contribution to the VOC reduction had to come from these suppliers. They developed either resins with less VOC or waterborne products with a minimum amount of VOC.

The paint manufacturers received these new developed products and incorporated them in a new generation of paints. For them it meant extensively evaluating their new paints against many requirements for both the wet product and for the ultimate dried film. When supplying decorative paints one has to remember that products require stability when they are placed on the shelves in shops and also need to reproduce time and again the same colour from colour mixing systems in the paint shops.

From the lab to the field; the application by the master is the ultimate test!

As the VOCs were reduced in the new generation of coatings a whole set of new properties were to be evaluated during the application. How easily does the new paint brush or roll? How long does it need to dry before the painter can apply a second layer over it? The new generation required a complete re-training of the professional painter. The main problems that had to be addressed were applying the right layer thickness and drying times.

Via a process of reiteration of feed-back and next step improvements the hurdles were overcome. And today after a period of good communication along the supply chain the assignment has been fulfilled.

VOC benefits and the investment costs

How sustainable was this development? What effect will it have on the planet?

VOCs derive from petrochemical resources and are considered as scarce.

With the full conversion to the new generation of products now materialized, the Decorative coatings sector has since the year 2000 realized a reduction in the use of VOCs of approximately 250 thousand tons.

It is estimated that the cumulative R&D investment for the actors along the supply chain (in particular the resin producers and the paint manufacturers) ranges between 400 and 600 million € over the period between 2002 and 2010.

But the costs for product development were not the only ones. The decorative coatings sector had also to absorb higher than anticipated costs for compliance with labelling requirements of the PD. A complete new range of labels had to be developed and affixed on paint-cans reflecting the VOC content in the can.




Total costs for re-labelling and warehouse procedures for the Deco sector have been estimated to be: over 700 Million €.

It is clear that the Decorative paint industry will need several years to have a fair return on these investments.

Further reducing the VOC content in decorative paints may have a counter effect on sustainable development

Can the VOC content of this new 2010 generation products be squeezed further?

A fair question which was also posed during the review of the Product Directive that was organized by the European Commission (EC).

With the new generation of low VOC paints, the CEPE members from the decorative coatings sector believe that the 2010 VOC ceilings for Decorative Paints and Varnishes in the Product Directive (2004/42/EC) represent the practical limit of what is technically feasible without compromising quality and usability across the EU. More stringent limits would impact on practical workability and/or film performance and appearance.

And on top of that they would have a reduced service life before re-painting is needed. Those shorter repaint cycles would mean larger environmental impact such as an increased carbon foot print or VOC use. In other words less sustainable.

CEPE is pleased to say that her view has been recognized by the EC and that no further lowering of VOC limits were incorporated in the Product Directive.

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