

Information Sheet

Renewable Raw Materials in Offset Printing Inks

As far back as the time when letterpress printing was invented by Gutenberg, renewable raw materials such as vegetable oils, as well as tree derived natural resins, or their derivatives have been widely used in printing inks.

As a result of the industrialisation of the printing trade, diversification in printing methods and the constantly growing demands with respect to applications, printing inks have seen an increasing use of synthetic raw materials in their formulation.

Today, the printing inks industry is using raw materials from renewable resources as well as petrochemical based ones; this has become necessary in order to be able to produce high-performance printing inks with the desired properties for all printing processes.

Consequently, the use of vegetable oils and natural resins as raw materials is not just the latest gimmick in an ecological trend, but actually reflects the technical progress which has been made.

The European demand for printing inks currently lies at around 1 million tons per annum. Some 40% of these are offset printing inks, of which a great deal is manufactured from vehicles that are formulated to be mineral oil free. They consist mainly of vegetable oils, with fatty acid esters and alkyd resins derived from vegetable oils, as well as modified pine tree resins.

Despite all the euphoria about renewable raw materials, it is important to remember that the majority of them only take on their full effectiveness when they are adapted to the respective application through the various printing processes.

Sheet-fed offset printing inks based on mineral oil free vehicles are widely used and are applied on a large scale, both in packaging and publication printing. Web-offset printing inks (newspaper and heat-set) are also available in mineral oil free versions, but at present are only niche products.

The vapour pressures of solvents used in sheet-fed or web offset inks, be they mineral oils, vegetable oils or their derivatives, is < 10 Pascal at ambient temperature. As a result, under standard conditions¹, they are not categorised as volatile organic compounds (VOCs) as per European Directive 2010/75/EU.

The motivating forces behind the trend toward using renewable raw materials include performance benefits in a number of application areas, conservation of our finite reserves of crude oil in terms of sustainability, increasing prices for mineral oil products in the long term and – last but not least – ecological aspects.

In view of the ongoing discussions on sustainability and reduction of CO₂ emissions, a general return to renewable raw materials is also in the interest of the farming industry; this is because the industrial use of agricultural products in the non-food sector creates an additional outlet for the farming industry. However, the possible environmental impact of oil plant cultivation specifically for industrial use, as well as the effect on foodstuff supply in the countries of origin, must also be taken into account.

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¹ However, under application conditions (elevated temperature during the drying process), the solvents in heat-set printing inks are categorised as VOCs under the terms of Directive 2010/75/EU.