

Printing ink industry contribution to the paper, paper converting and food industry initiatives to reduce mineral oil in paper and board packaging

Monitoring in Europe of packaging and foods has identified mineral oil contamination in a range of packaged foods. Mineral oils are widely used, and end up in foodstuffs by various routes. Since then, almost all sectors of the food industry as well as laboratories and supply industries have been concerned with the presence of mineral oil hydrocarbons and investigated into their origin. As a result, industry has gained a comprehensive understanding of the different sources of mineral oil contaminations.¹ Many measures for the reduction of the transfer and occurrence of undesired mineral oils that have already been taken, show objectively measurable success.

There are many different routes by which contamination of foodstuffs with mineral oils can occur. Food packaging has been identified as one of these sources. EuPIA members have long offered mineral oil-free inks to be applied to the non-food side of packaging, and recommend that only these inks are used for these applications. Mineral oils can, however, migrate from recycled paper and board used for food packaging.

In several EU member states the food packaging chain was called to take measures such that levels of mineral oil in foodstuffs are reduced. The European Commission has issued a recommendation² on the monitoring of mineral oil hydrocarbons in food and in materials and articles intended to come into contact with food in 2017. In Germany, the BMEL has drafted a legislation aimed at restricting mineral oil in food contact materials made from recycled paper and board.

In this respect, the European trade associations representing the paper industry (CEPI) and the paper converting industries (CITPA) have recommended to their members to only use mineral oil-free printing inks on paper and board packaging. Additionally, the German Federation for Food Law and Food Science (BLL) has recommended to the food industry the use of specific printing inks:

- **for food packaging:** printing ink systems, which have been optimized for migration
- **for all other packaging:** mineral oil free printing inks

To enable printers and converters to meet their respective industry associations' commitment, EuPIA identifies the following packaging ink options:

¹ BLL (German Federation of Food Law and Food Science) "Toolbox for Preventing the Transfer of Undesired Mineral Oil Hydrocarbons into Food" 2017

² Commission recommendation (EU) 2017/84

- **Sheetfed offset printing**

Both types of offset inks mentioned below are formulated without mineral oils³ and are usually based on vegetable oils, vegetable oil esters or, in case of UV curable sheetfed inks, are based on synthetic reactive diluents and resins.

- **Printing inks for food contact materials (FCM inks)**

These inks, sometimes addressed as “low migration inks” or “food packaging inks”, are manufactured according to GMP and are optimized not only with regard to the lowest possible content of mineral oil, but also any unevaluated migratory substances. As raw materials are specially selected, the levels of trace impurities are significantly lower compared with standard inks.

For more information, please consult the EuPIA customer information note regarding the use of sheetfed offset inks and varnishes for the manufacture of food packaging (www.eupia.org).

- **Conventional printing inks formulated without mineral oil for all other packaging**

Generally the content of mineral oils originating from the raw materials is no more than 1%.

- **Flexographic printing**

- Flexographic inks for paper and board are usually water based or UV curable, and are therefore free of mineral oils.
 - For food packaging applications, specially formulated flexographic inks are recommended.

- **Digital printing**

- Digital printing technologies include inkjet, electrophotography, magnetography, among others
 - Digital printing inks are usually water based, UV cured, solvent free or solvent based and are free of mineral oils

EuPIA, 2010-10-14

1st amendment 2015-03-11

2nd amendment 2015-12-01

3rd amendment 2018-08-02

³ For the purposes of this initiative, EuPIA defines mineral oil as follows: Mineral oils are petroleum derived substances, produced by refining crude oils. They are manufactured by atmospheric and vacuum distillation (at temperatures between ~300°C and ~700°C) of crude oil and are then further refined. They consist of complex mixtures of hydrocarbon molecules of different size (20 to 30 carbon atoms) in which the carbon chains are linear, branched and/or cyclic. Types of mineral oils may be characterised by their content of paraffinic, naphthenic and/or aromatic structures. Mineral oils classified as carcinogenic according to CLP regulation are not used by EuPIA members in accordance with the EuPIA Exclusion Policy. Mineral oils have to be distinguished from waxes and hydrocarbon solvents. Hydrocarbon solvents have a different manufacturing process which distinguishes them from mineral oil, with their chain lengths up to C20. The terms MOSH, MOAH, POSH, etc are terms used to describe various components seen in chromatography, and do not necessarily align with the hydrocarbon derivatives used as raw materials.