Statement on

Mineral oils in printing inks and varnishes

Consumers are exposed to a wide range of mineral oils via different routes. These mineral oil hydrocarbons (MOH) may be used intentionally during the production of food, or may unintentionally migrate into the food from packaging materials. Newspapers and other printed media entering the recycling chain are regarded as the main source of mineral oils in recycled paper and cardboard food packaging (Biedermann, M., Grob, K., *Eur Food Res Technol* **2010**, 230**:**785; Biedermann, M., *et al. Packag Technol Sci.* **2011**, 24(2):61). There are numerous other mineral oil sources, including food additives, anti-dusting materials for grains, processing aids, additives in the manufacture of plastics, and lubricants in the manufacture of cans.

The uptake of MOH is seen as a potential health hazard, as some saturated mineral oils (MOSH) may accumulate in human tissue, and some aromatic hydrocarbons (MOAH) may act as genotoxic carcinogens. EFSA concluded in the draft of the *"Update of the risk assessment of mineral oil hydrocarbons (MOH) in food"* (endorsed 25.01.2023) that "Considering a margin of exposure approach, the Panel concluded that the dietary exposure to MOSH does not raise concern for human health for all age classes. Genotoxicity and carcinogenicity are associated with MOAH with 3- or more aromatic rings".

In our comprehensive raw material introduction process, we request from our suppliers the disclosure of even minute amounts of mineral oils (MOSH and MOAH, in the range of C10-C35). This knowledge enables us to formulate our inks in a responsible way.

MOSH and MOAH have to be unequivocally distinguished from "polyolefin oligomeric saturated hydrocarbons" (occasionally addressed as POSH). These are oligomers known to potentially be released from polyethylene and polypropylene food contact materials, which by coincidence have a similar analytical detection profile to MOSH in migration testing. The presence of trace amounts of the mentioned hydrocarbon fractions coming from raw material impurities, from the process or as adventitious contaminant cannot be excluded. However, the amount of MOSH, MOAH or POSH in printed products coming from the inks is expected to be negligible.

Inks intended for Tobacco Applications

For Tobacco Applications, especially for die/monogram inks, white mineral oils of pharmaceutical grade are still in use. These inks undergo specific brand owner and authority approval before implementation.

French order on mineral oils in printing inks

In **France**, "the ban on the use of mineral oils in packaging, provided for in article 112 of law n° 2020-105 of February 10, 2020 (loi AGEC) relating to circular economy and the fight against waste, applies to mineral oils containing substances that interfere with the recycling of packaging waste or limit the subsequent use of recycled materials because of the risk that these substances pose to human health". The decree n° 2020-1725 of December 29, 2020 specifies various adaptation provisions relating to extended producer responsibility

(EPR). An “Arrêté” from the Minister for the Environment with more information regarding how packaging and ink producers can remain compliant with this Décret was published on the 13th of April, 2022.

Contrary to the scope of the Circular Economy Law, which covers mineral oils on printed products and packaging, the French order is only focusing on the mineral oil content of the used printing inks. It defines limit values (mass concentration in ink) of certain mineral oil constituents for the inks, which may be used for the printed products in scope.

The substances affected by the ban on the use of mineral oils are:

- Mineral oil aromatic hydrocarbons (MOAH) comprising 1 to 7 aromatic rings;
- Mineral oil saturated hydrocarbons (MOSH) with 16 to 35 carbon atoms.

The regulatory reading can be summarized and illustrated in the figure below:

Mass concen-tration in ink	From 01/01/2023 to 31/12/2024	From 01/01/2025
[$MOAH_{1-7\ ring}$]	Allowed if [$MOAH_{1-7\ ring}$] ≤ 1 %	Allowed if [$MOAH_{1-7\ ring}$] ≤ 0.1 % **OR** Allowed if [$MOAH_{3-7\ ring}$] ≤ 1 ppm
[$MOSH_{C16-C35}$]	No specific requirements for this order for this period	Allowed if [$MOSH_{C16-C35}$] ≤ 0.1 %

This means, that until the end of 2024 a limit value only for MOAH applies, while from 2025 on limit values for MOAH and MOSH apply.

Compliance with the French Decree regarding mineral oils in packaging

The products from Siegwerk are fulfilling the requirements from the French Decree starting 2023. Subsequent 2025 limits are subject to current implementation measures.

Nevertheless, it has to be pointed out, that today ink manufacturers are not in a position to justify the MOAH threshold from 2025 ($MOAH_{3-7\ ring}$ ≤ 1ppm) in the French ban. The analytical capability to accurately quantify MOAH in printed articles is questionable. The inability to determine the source of MOAH in printed articles adds another level of uncertainty. Here it has to be mentioned that the French mineral oil decree refers specifically to mineral oils coming from printing inks. In addition to this there are a number of raw materials which are allowed to be used in Food Contact Material Applications, which can generate analytical results which can easily be mistaken for mineral oils. Examples of these include paraffin waxes and the lower molecular weight fraction of polyethylene.

The information in this document reflects Siegwerk’s policy and commitments. This statement is valid without signature.