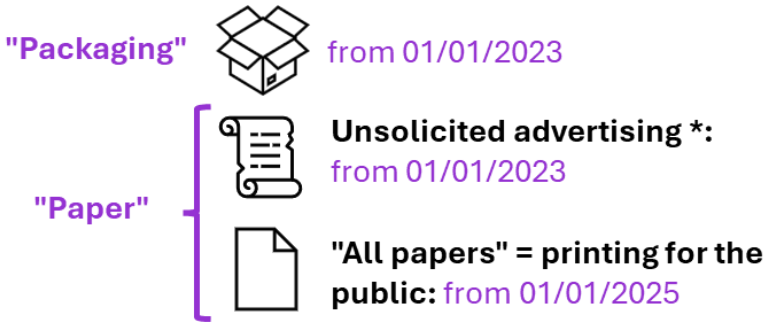
Information Note on French Order on Mineral Oils in Printing Inks

July 2024

Executive Summary

In France the use of mineral oils in packaging and prints shall be banned. As illustrated below, different phase-out timelines (fixing parameter and limit values) apply.



*art. 112 loi Agec: *'letters of unsolicited advertising leaflets and catalogs for the purpose of commercial promotion'*

As of 1 January 2025, stipulated limit values mean that any ink formulations containing intentionally added mineral oils can be considered to not meet the French Law thresholds and should therefore not be used. Alternatives might be available.

The limits in the French Order are low enough that unintentionally added trace mineral oils could result in findings above limit values. In the absence of a harmonised and reliable analytical method for the accurate quantification of MOSH/MOAH*, general declarations of "mineral oil free" inks down to ppm levels should be considered with caution.

EuPIA strongly recommends that for the time being compliance work should rely on a best practice approach; focusing on open discussions with the printing ink manufacturers and accompanied by fact based regulatory statements.

*MOSH: Mineral oil saturates hydrocarbons/MOAH: Mineral oil aromatic hydrocarbons

Legal background

Agec Law – Article 112[1]

The **French Circular Economy Law** (Loi) from 2020 specifies in article 112 that:

- from 1st **January 2022**, the use of mineral oils in **packaging** is prohibited.
- from 1st **January 2025,** it is prohibited to use mineral oils in **prints for the general public**. For **unsolicited advertising leaflets and catalogues** with commercial purposes, this prohibition shall apply from 1 January 2023.

Decree N°2020-1725[2]

Decree (Décret) N° 2020-1725 of 29 December 2020 elaborated, in Articles D. 543-45-1 and D. 543-213 of the Environmental Code, that this ban applies to mineral oils containing substances that interfere with the recycling of packaging waste, or limit the use of recycled materials, due to the risks that these substances present for human health.

French Order of 13th April 2022[3]

An Order (Arrêté) from the French Minister of the Environment was published in the French Official Journal on 3rd May 2022. This was necessary as Article 112 of the Circular Economy Law and the Decree N° 2020-1725 neither defined what was meant by the term mineral oil, nor the substances of interest, nor which limit values would apply. To paraphrase, the Order was supposed to contain technical details specifying the substances concerned by the ban on the use of mineral oils on packaging and printing intended for the public.

It can be concluded that inks for packaging as well as unsolicited publication purposes needed to be formulated in accordance with the mineral oil specifications of the French Order, starting from 1st January 2023.
Inks for other printed paper products for the public, such as newspapers, magazines, or books, will be subjected to this regulation starting 1st January 2025.

Precise provisions for mineral oils in inks from the French Order

Whereas the French Circular Economy Law covers all mineral oils on printed products and packaging, the French Order focuses only on printing ink mineral oil content. It defines limits (mass concentration in ink) of certain mineral oil constituents for inks used in the printed products mentioned in the Law.

The Order explains that "mineral oils" are defined as oils produced from feedstocks, derived from petroleum hydrocarbons, used in the manufacture of inks.

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**.

[1] Loi n° 2020-105 du 10 février 2020 relative à la lutte contre le gaspillage et à l'économie circulaire (https://www.legifrance.gouv.fr/jorf/article_jo/JORFARTI00004155387)
[2] Décret n° 2020-1725 (https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000042754025)
[3] Arrêté du 13 avril 2022 (https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000045733481)

The following limit values and timelines are defined:

- From **1 January 2023**, the ban on the use of mineral oils applied when the concentration by mass in the ink of MOAH is greater than 1%. *(already in force)*
- From **1 January 2025**, more demanding limit values on the presence of mineral oils apply
  - for MOAH: where the mass concentration in the ink of these substances is greater than 0.1% OR the mass concentration in the ink of compounds with 3 to 7 aromatic rings is greater than one parts per million (ppm);
  - for MOSH: where the mass concentration in the ink of these substances is greater than 0.1%.

Therefore, until the end of 2024 a limit value applies only to MOAH, while from January 2025, limit values for both MOSH and MOAH apply.

In light of the packaging and printing paper provisions of the Agec Law Article 112, at the time of writing bans are already in place for printed packaging as well as unsolicited publication purposes. Other paper printed products for the public, such as newspapers, magazines and books, will only be banned from 1st January 2025.

These points are summarised and illustrated in the figure below:

Affected Products	Packaging, Unsolicited advertising	Packaging, Unsolicited advertising, Printed Paper for the public
Mass mineral oil concentration in ink	**From 01/01/2023 to 31/12/2024**	**From 01/01/2025**
	Allowed if [**$MOAH_{1\text{-}7\ ring}$**] ≤ 1%	Allowed if [**$MOAH_{1\text{-}7\ ring}$**] ≤ 0.1% **OR** Allowed if [**$MOAH_{3\text{-}7\ ring}$**] ≤ 1 ppm
	No specific requirements for **MOSH**	Allowed if [**$MOSH_{C16\text{-}C35}$**] ≤ 0.1%

What is the general situation on the market?

Printing inks for packaging that are formulated without mineral oils are available on the market.

For several years, EuPIA and other associations of the packaging supply chain have recommended to use mineral oil free inks for food contact material applications.[4]

Mineral oil-based inks are mainly used in offset inks in the **publication** sector.[5]

For **Heatset,** inks with a reduced content of aromatic hydrocarbons are available and hence it is technically possible to fulfil the provisions that apply until 31 December 2024.
Typically, Heatset inks have been formulated with mineral oils from petroleum feedstocks. To note: Vegetable oils, such as linseed oil and soya oil, are generally not suitable as replacements for mineral oils, as their boiling points do not allow for efficient evaporation. Raw material suppliers have developed alternative solvents sourced from non-petroleum based feed stocks, which are not subject to the decree. These new alternatives are often falsely chemically interpreted as MOSH, but in reality are saturated hydrocarbons (alkanes) not originating from mineral oils.[6] EuPIA members are evaluating their potential as replacements. Therefore, **no broadly applicable mineral oil-free Heatset ink as defined by French Law is currently available** to meet the provisions from 1st January 2025 on the European market.

Newspapers are typically printed using the **Coldset printing** process, with **inks containing substances that fall under the scope of mineral oils.** Considering this fact, current Coldset inks can be used until December 2024. Two publicly funded projects in Germany and France investigated the potential use of Coldset inks formulated without mineral oils. EuPIA members contributed to both projects.[7] Within these projects it was shown that Coldset inks formulated without mineral oils are possible, but this is still in a testing phase. Before full commercialisation of such inks, major machinery adaptations are neededand unforeseen technical difficulties may yet arise.

Sheetfed inks based on vegetable-based oils and **formulated without mineral oils are available on the market.**

High volume catalogues and magazines are often printed using **Publication Gravure** inks. The inks primarily use toluene as the sole solvent. Toluene is generally not seen as a mineral oil, however under the definition of mineral oils provided by the French authorities, such inks would already have been banned from January 2023. Discussions between the French authorities and industry led to a draft Q&A document (in French)[8], which aimed to address several outstanding

[4] Printing ink industry contribution to the paper, paper converting and food industry initiatives to reduce mineral oil in paper and board packaging: 2018-08-02_Printing_Ink_Industry_Contribution_to_Mineral_Oil_Reduction_in_Paper_and_Board.pdf (eupia.org)
[5] EuPIA statement on the use of mineral oils in offset inks: 2019-11-06_EuPIA_Statement_on_Mineral_Oils_in_Offset_Inks.pdf
[6] Biomass-to-Liquid, Gas-to-Liquid and Hydrotreated Vegetable Oil are examples of processes used to produce such substances
[7] https://wan-ifra.org/insight/report-changing-to-mineral-oil-free-inks/
[8] Link on https://www.ecologie.gouv.fr/politiques-publiques/emballages-menagers-papiers-graphiques: www.ecologie.gouv.fr/sites/default/files/documents/FAQ_HM_emballages_impressions.pdf

questions including toluene. The French authorities clarified that **toluene, particularly used as a solvent in gravure printing, is not subject to the ban on the use of mineral oils**, although its physico-chemical properties may be similar to certain defined mineral oils. Partially in response to this issue, it was noted that Article 3 of the Decree of 13 April 2022 provides an additional possibility to verify compliance with the mineral oil threshold values after the printing ink has been applied to the printed product. This provides flexibility for manufacturers, or interested parties, to **demonstrate compliance of the printed goods**, particularly where the volatility of certain substances may result in a lower concentration after application to the medium (translation from Q&A document)

Please note: **As of 1st January 2025, any ink formulations containing intentionally added mineral oils can be considered to not meet the French Law related thresholds and should therefore not be used**. In case of doubt about intentionally added mineral oils, please discuss with your ink supplier as to which inks are affected and whether alternatives are available.

Critical issues for ink manufacturers

Article 112 of the overarching Circular Economy Law clearly covers mineral oils on packaging and printed matter. **However, the French Order only defines provisions for the inks, NOT the printed product.** As the printed products are also in scope of the regulation, it is unclear how to demonstrate or control compliance.

The Law might be interpretated as needing to 'demonstrate' that a printed product has been printed with 'compliant' inks. Therefore, in many cases, the burden of proof of compliance is transferred solely to the printing ink manufacturer. This has led to a large number of requests being received from converters and brand owners, demanding external analytical test reports specifically on ink level.
Yet both the French Decree and Order provide **no analytical guidance**, meaning it is currently unclear how compliance with the limit values should be reliably demonstrated. Test results will depend entirely on the analytical method applied, leading to market distortion. **A clear testing method standard still needs to be defined**.

In response to these requests, and in the absence of clear testing method standards in the French provisions, EuPIA member companies have gained wider knowledge about the reliability of external testing capabilities over the past year. Currently it can be stated that analytically accurate quantification of MOSH/MOAH in printing inks is questionable. Extensive discussions have been carried out with renowned laboratories in the field, leading to many open questions from both sides. Possible solutions from the side of the laboratories are not available for the moment.

Where some laboratories have implemented increasingly sophisticated mineral oil detection methods, when it comes to the interpretation of the results, the outcomes are not reliable enough. Exact knowledge of ink components, coupled with in depth analytical know-how on both sides (laboratory and test requester) is needed to avoid possible false positive/negative results being reported. In practice this is not readily manageable.
Additional complexity is added because a number of raw materials/substances legally allowed to be used in Food Contact Material applications can easily be mistaken for mineral oils. The analytical patterns they create are hardly able to be clearly separated. For example:

- saturated, oligomeric hydrocarbons made from polyolefins (**POSH** - Polyolefin Oligomeric Saturated Hydrocarbons), resin oligomeric saturated hydrocarbons (**ROSH**), and cycloalkanes are known to be falsely attributed to MOSH fractions.
- resin oligomeric aromatic hydrocarbons (**ROAH**) can be easily mistaken as MOAH.
- rosins, paraffin waxes, certain resins, bio-based solvents and lower molecular fractions of polyethylene/polyethene waxes (all widely used in printing inks) can be falsely allocated to belong either to MOSH and/or MOAH.

An explicit quantification of the possible real MOSH/MOAH's present in the sample material is therefore, due to interference, widely not possible.

As a consequence, EuPIA member companies refrain from conducting inconclusive analytical testing on inks until a proven and recognised analytical testing plan for mineral oils is available on a worldwide level.

To the same extent, analytical results/test reports which suggest full compliance with **all** the requirements of the French decree should be taken with caution.

Furthermore, as the 1 ppm threshold for MOAH of 3 to 7 aromatic rings is very low, this can encompass certain aromatic compounds that may be present as impurities in the raw materials used in ink formulations. This means that even if an ink is formulated without mineral oils (without explicitly known content), unintentional traces could still be present. It is important to note that the above described analytical challenges are applicable to the same extent to raw material suppliers of the printing ink industry. No clear guarantee of non-intentionally added mineral oils can be given for the time being. **Therefore, declarations from ink manufacturers on "mineral oil free" status, without a clear specification of the percentual boundaries of the declaration, should be considered with caution.**

For all these reasons, we strongly recommend that for the time being compliance work should rely only on a best practice approach: open discussion with printing ink manufacturers, regulatory statements based on known composition data and statements of composition for food packaging applications.

Plans of the EU Commission on Mineral Oils

Given the importance of the mineral oil topic, it is worth nothing that after the EFSA opinion on mineral oils was revised in 2023, the EU Commission started to work on regulations related to mineral oil hydrocarbons.

The Commission proposes three measures:

- The implementation of binding maximum levels of MOAH in foodstuffs
- A monitoring recommendation for MOSH
- A scheme for sampling and analysis

There has been clear progress in the area of food testing, and therefore EuPIA strongly recommends to follow-up and focus on these EU initiatives and the resulting measures.