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Laboratory Lommatzsch & Säger publish FEICA-commissioned study on the safety of packaging hotmelts published

Study looks into the potential migration of mineral oil hydrocarbons from typical packaging hotmelts

FEICA commissioned a study from Laboratory Lommatzsch & Säger to look into the potential migration of mineral oil hydrocarbons from typical packaging hotmelts. This study, titled 'Extraction, migration simulation and storage test regarding oligomeric hydrocarbons from hotmelt adhesives used in cardboard packaging', is now available for the food packaging value chain and regulators.

The purpose of the study was to determine the safety of hotmelts in adhesives applications, specifically in cardboard food packaging. The conclusion was that all investigated hotmelts were safe for use in the tested application. The study used a systematic approach to examine the migration from hotmelt adhesives and considered correlation factors.

Executive Director of Regulatory Affairs at FEICA, Jana Cohrs, stated 'Laboratory Lommatzsch & Säger was commissioned by FEICA as they are experts in the field. The study revealed that the investigated hotmelts meet the BfR draft criteria concerning MOAH, if interpreted as mineral oil. The resulting report, freely available on the FEICA website, will take you step-by-step through the study'.

Typical hotmelt raw materials, are mainly comprised of polymers, paraffinic waxes, hydrocarbon resins and additives. Although the single components might be all listed in the 10/2011 positive list, especially oligomers from the hydrocarbon resins may partly contribute to MOSH (Mineral oil saturated hydrocarbons) / MOAH (Mineral oil aromatic hydrocarbons) fractions in LC-GC-FID (liquid chromatography-gas chromatography with flame ionisation detector) analysis. When applying further analytical techniques (e.g. GCxGC-TOF-MS) it is possible to distinguish hydrocarbon resin oligomers from the hydrocarbons (MOH) derived from mineral oil.

Three approaches were used in the study: extraction of hotmelt, migration simulation of hotmelt (gaseous phase) and real storage tests (food in a cardboard box sealed with hotmelt). Relationships and comparisons of the results of the tests were also considered. As expected, extraction was determined not to be a meaningful approach to estimate migration because this approach severely overestimates reality. In the extraction approach, the solvent extracts the total available hotmelt hydrocarbons, and does not consider just the part that could migrate. Real storage tests on the other hand are prohibitive because they take too much time to carry out. The study could show that simulation is the preferred way forward. Migration simulation is able to correctly predict the real situation in a packaging application, when the analysis is focused on saturated hydrocarbons and aromatic hydrocarbons (MOSH / MOAH).

A calculation model, furthermore, was developed based on MPPO (Modified polyphenylene oxide) migration simulation (Tenax®, 40 °C, 10 days). The model predicts real migration in terms of indirect contact concerning storage of dry foodstuff for 12 months at room temperature. The

model will help prevent testing set-ups that are inappropriate and interpretations that are incorrect.

In summary, all investigated hotmelts (typical food packaging hotmelts), were demonstrated in the study to be safe* for use in the tested application. The hotmelts would therefore meet BfR draft criteria concerning MOAH, if interpreted as mineral oil. Of the three methods used in the study, extraction provided no meaningful approach to estimate migration. Simulated real storage proved to be the best method.

Alexandra Ross, Product Regulatory Specialist EIMEA at H.B. Fuller Deutschland GmbH, and chair of the FEICA Paper & Packaging Technical Working Group, said 'We are glad that the results of the study could underpin our approach as described in an earlier MOH FEICA factsheet. With the storage of real packed food over 12 months, the applied hotmelts could show pretty low migration tendency, especially for the fraction of MOAH. The structured approach with typical hotmelt variations together with the competent analysis by Lommatzsch & Säger Laboratories has led to a great document with understandable arguments, also for the right choice of test method. This report will certainly help us in any discussion with our customers, when the subject of MOSH and MOAH is raised'.

The study is available via www.feica.eu.

* Safe here means that the hotmelts would meet BfR (Bundesinstitut für Risikobewertung) draft criteria concerning MOAH (mineral oil aromatic hydrocarbons), if interpreted as mineral oil.
<https://ec.europa.eu/growth/tools-databases/tris/en/index.cfm/search/?trisaction=search.detail&year=2020&num=510&mLang=EN>

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About FEICA

FEICA, the Association of the European Adhesive & Sealant Industry is a multinational association representing the European adhesive and sealant industry. With the support of its national associations and several direct and affiliated members, FEICA coordinates, represents and advocates the common interests of our industry throughout Europe. In this regard FEICA aims to establish a constructive dialogue with legislators in order to act as a reliable partner to resolve issues affecting the European adhesive and sealant industry.

Our industry provides leading edge technologies that make the manufacture and supply of many everyday products possible; it contributes greatly to the European and global economy, fosters sustainable development, encourages innovation and offers stimulating careers for people with a wide range of skills.

For further information about FEICA, please visit our website www.feica.eu.

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