



Analytical Support for Food Contact Notifications and Flavor Assessments

Method development, volatile fingerprinting and ultra-trace analysis for targeted and non-targeted regulatory compliance measurements.

Executive Summary

When developing new coatings or other food contact materials it is important to have analytical performance data at an early stage. To borrow a concept from the pharmaceutical industry it is better to fail early and fail hard – you do not want to go through all the product development and regulatory compliance expense only to find your new coatings degrade resulting in materials which will prohibit food contact approval or potentially fail the end-user's final taste panel testing.

At the ECCD Deventer we have developed a suite of strategies backed by state-of-the-art analytical systems which can ensure that whichever formulations you decide to take forward, you have the data to give you the best chance of not only meeting the strict regulatory requirements for a successful Food Contact Notification submission but will also keep the end-user community satisfied once the product is in acceptance testing.

Expert Capability
Center Deventer

Delivering Expertise to your Business

Key facts



>100

Analytical
Techniques



>1000

Customer
Requests
per year



>10000

Samples
Analysed
per year



Targeted and Non-Targeted Analysis

To deliver the analytical data required to ensure safe materials which are fit-for-purpose can be loosely classified into targeted and non-targeted analyses.

Targeted analytical methods have the lowest limits of detection and are often used to quantify residual unreacted monomers, oligomers and the multitude of additives which go to make up modern coatings systems. This is the normal approach in Food Contact Notification (FCN) studies.

Non-targeted analyses are becoming more important as regulators are more frequently requesting a “prove it is safe” approach to compliance. This essentially means you need to conduct screening experiments on samples to identify problems that are outside of the known potential sample contaminants monitored in the targeted approach. This can be relatively expensive to carry out and a cheaper alternative is to use normal chemical knowledge to execute a semi-targeted approach for potential degradation products or metabolites of the main components.

Complementary analytics to Taste Panel studies

Volatile fingerprinting

Analyzing (or sniffing) the headspace above a sample can yield very useful information accelerating time-to-market of successful formulations. Unwanted interactions of new coating candidates with food or beverage materials can be spotted much earlier in the new product development life-cycle allowing the early elimination of candidate formulations with fundamental issues conventionally only identified after FCN approval has been granted and the customer taste panels become involved in new-coating acceptance testing.

Additionally, volatile profiling can provide hard scientific data to support taste panel results following customer complaints.



Figure 1: Selected-ion flow-tube mass spectrometry (SIFT-MS).



Extract analysis

The ECCD in Deventer has a long-standing reputation for delivering results to regulatory body submissions in areas such as Total Non-volatile Extract analysis for components smaller than 1000 Da. These are never 'standard' analyses when dealing with research samples. The ECCD regularly relies on Size Exclusion Chromatography with mass spectrometric detection to deliver a more precise definition of the 1000 Da limit supported by a holistic quantitative Nuclear Magnetic Resonance spectroscopy approach and robust elemental analyses using ICP-OES and ICP-MS.

Ultra-trace analysis

In flavor studies laboratories often struggle to work reliably down to the ppb or ppt (i.e. µg/kg or ng/kg) levels of flavourants detected by human senses. The ECCD in Deventer is equipped with a GC/Ion Mobility Spectrometer routinely quantitatively measuring volatile sample fingerprints backed up by large volume SPE/GC/MS and SIFT/MS confirmatory studies delivering volatile compound identification and quantification.

In-situ coatings analysis by advanced microscopy

The physical state of a new coating on a substrate plays an important role in its performance characteristics. The ECCD in Deventer boasts a powerful suite of microanalysis capabilities to support new coatings development including:

- Scanning and transmission electron microscopy, both combined with energy dispersive X-ray analyzer
- Surface analysis by X-ray Photo-electron Spectroscopy and expertise in Time-of-Flight Secondary Ion Mass Spectrometry
- Atomic Force Microscopy linked to a Raman imaging microscope
- Infrared imaging microscope
- High resolution fluorescence microscopy

Conclusion

Whatever your requirements for analytical support for Food Contact Notifications and Flavor Assessments studies are, ECCD Deventer is best placed both from the perspective of a top of the range instrumentation park to some of the best analytical scientists in the business to ensure your success. With many years of experience in method development, volatile fingerprinting and ultra-trace analysis for targeted and non-targeted regulatory compliance measurements we should be able to accelerate and support your new product development.

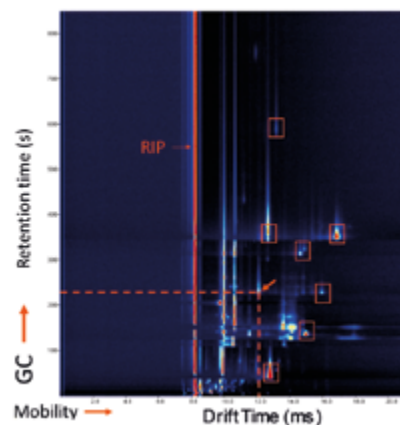


Figure 2: GC x Ion Mobility headspace analysis.

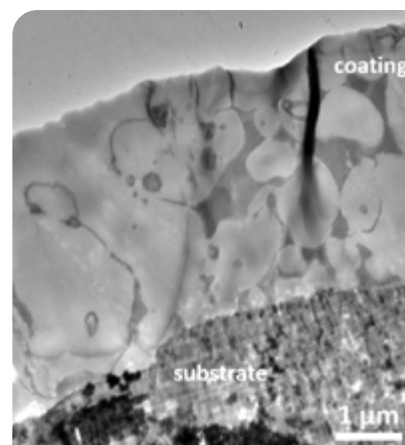


Figure 3: TEM image of a cross-sectioned, multi-polymeric, coating (3 µm) on a substrate, showing the distribution of the different polymers in the film.

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In terms of state of the art equipment and diversity of available expertise we are the most advanced independent problem solving analytical center in Europe. With world class experts and more than 50 years of success in problem solving in chemical industries, we recognise the need for high tech analytical problem solving. We have the knowledge and the capability to deliver efficient and effective solutions in areas such as:

- Analytics for better business development
- Method development
- Faster time to market
- Risk management and control
- R&D time reduction
- Better product quality
- Product registration

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