



Food Packaging Materials Testing

Food packaging materials can be made with plastics, paper and board, glass, metal, wax, and printing inks. These packaging materials are directly and indirectly in contact with our food.

Eurofins EAG Laboratories offers a wide range of analytical instruments and capabilities to support the food industry with packaging testing including research and development, regulatory compliance, product safety, migration and failure analysis.

From standardized methods for food contact testing to customized methods for specialty materials, EAG can help.

Food Safety & Contamination

Example approaches for food safety and contamination testing:

- Gas Chromatography-Mass Spectroscopy (GC-MS) for volatiles and semi-volatiles
- Liquid Chromatography-Mass Spectroscopy (LC-MS) for non-volatiles
- Ion Chromatography (IC) for salt concentrations
- Inductively Coupled Plasma -Mass Spectroscopy (ICP-MS) for elements
- Fourier-Transform Infrared spectroscopy (FTIR) for bulk material characterization
- Microscopy to identify unknown particulates
- Migration testing via food or food simulant, solvent extraction, digestion, and leachables
- Scanning Electron Microscopy/Energy Dispersive Spectroscopy (SEM-EDS) for elemental profile



Case Study: Smoke Damage on Food Cans

Food packaging was exposed to a warehouse fire. There was concern about smoke residue on the packaging material. A comparative analysis was conducted on the inside of exposed versus unexposed packaging.

Extracts of the packaging were analyzed using GC-MS compared to a polyaromatic hydrocarbon (PAH) mixed analytical reference standard (indicative of smoke residue).

The results indicated smoke damage for certain cargoes located close to the fire, while products further away from the fire showed no sign of smoke damage.

Packaging Failure Analysis

Example approaches for packaging failure analysis:

- Optical Microscopy for film thickness
- Thermogravimetric Analysis (TGA)
- Rheology
- Differential Scanning Calorimetry (DSC) to study adhesive curing
- Gel Permeation Chromatography (GPC) for molecular weight distribution
- GC-MS and Pyrolysis-GC-MS
- Compression, tensile, and other mechanical testing
- LC-MS
- Dynamic Mechanical Analysis (DMA)



Case Study: Epoxy Liner Delamination

A metal can containing an epoxy liner was used for food packaging. However, the epoxy liner was delaminating from the inside surface of the can. A comparative analysis was conducted on a control versus suspect can looking for incorrect epoxy application (using cross sectional analysis and microscopy for film thickness), insufficient epoxy curing (using modulated DSC), and contamination (using GC-MS, FTIR, and EDS). We successfully identified the failure was caused by oil contamination.

Material Characterization & Deformulation

Techniques that can be used for materials characterization and deformulation:

- GC-MS
- LC-MS
- FTIR and SEM-EDS
- DSC
- Gel Permeation Chromatography (GPC)



Case Study: Deformulation of Casing

A specialty casing material was deformulated to determine the initial raw material and additive package. The starting materials, dyes, flavor package, thickness and strength of the casing were reported, and the client was able to make this specialty casing based on information provided.

Knowledgeable, Flexible Testing Support

Contact our team for help with your device testing needs.

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