

Food packaging - smart and safe

Always up to date with legislation changes
and new customer specifications with
Eurofins analyses for packaging

Context

An increasing amount of food is sold in packaging material. The packaging has to fulfil more and more requirements. Firstly, packaging shall sell, and carry all necessary information about the product, the ingredients and guidance on storage and preparation of food. Packaging has to be stable and fit for its purpose. It shall protect against microbial deterioration, and it shall be safe.

Materials and articles that come into contact with food are object of serious public concern. They must fulfil severe requirements on physical and chemical safety.

Legal Background

The European regulation (EC) No. 1935/2004 defines fundamental requirements of food packaging. According to this, packaging material shall not transfer their ingredients to food in quantities that may impair human health, or deteriorate aroma or taste.

Besides these very general rules some materials are regulated more in detail. Plastics are regulated in regulation 10/2011 amended by 321/2011. Specific rules are defined for twist off caps and the inner coatings of tin cans, but some very common food packaging materials like paper and board are regulated only in few countries.

Eurofins Offer

Eurofins offers a large range of services tailored to the needs of manufacturers and retailers.

Typical products investigated:

- Plastic containers, bottles, foils
- Tin cans, inner coatings
- Twist-off caps and glasses
- Paper and boards
- Printing inks and colorants used for packaging
- Dinnerware, cutlery (ceramic, metal, plastic)

Eurofins offers consulting on finding your way through the extensive European and national legislation.



Food



Typical food simulants

- Water
- Ethanol (10%, 50%, 95%)
- 3% acetic acid
- Olive oil
- Isooctane
- Tenax TA

Paper and board

Paper and board as packaging material for food are irreplaceable in every day life.

Also paper and board shall fulfil the general requirements for food contact material.

Some European countries have laws on paper and cardboard but there is no harmonised legislation for all of Europe.

Both European Council and German Federal Institute on Risk Assessment (BfR) published recommendations for paper and boards for food contact

Both recommendations contain lists with raw materials, additives, processing substances and colorants with upper limits for their use in food contact paper, along with specific migration limit values.

Tinplate cans

Tinplate cans offer food a very high protection against contamination, microbial deterioration as well as natural and artificial light.

There are no specific legal requirements on metallic food packages in Europe and most European countries, but cans shall, as all food packages, fulfil the requirements of European regulation (EC) No. 1935/2004 and thus alter neither food aroma nor taste, nor impair the customer's health.

Furthermore, substances must only migrate into food in technically unavoidable quantities. The inside of the tinplate cans shall be coated - either by a thin stannous layer or by varnishing typically based on PVC or epoxy resins.

Plastics

In case of plastics legal requirements are considerable.

Firstly, plastics shall, as all food packages, fulfil the requirements of European regulation (EC) No. 1935/2004 and thus alter neither food aroma nor taste nor impair the customer's health. Furthermore, substances must only migrate into food in technically unavoidable quantities.

There are many specific legal requirements on plastic food contact material in Europe and most European countries, defined by law or directive. There are three issues that shall be respected, as described below.

Approved ingredients

In general, only approved substances shall be used that are listed in table 1 in annex I European regulation 10/2011.

Overall Migration

Documentation shall be available showing that the overall migration limit is complied with. Future use of the packaging shall determine selection of food simulant, testing duration, and testing temperature.

The overall migration only determines the total amount of all substances that migrate from the plastics into a simulant, without any information on the specific substances involved.

Specific Migration

Some substances that are allowed in plastic for food have been assigned SML or Specific Migration Limit values (see appendix 1 of the regulation). If substances with an SML value are used then a specific migration test has to be performed.

Specific migration test may be skipped in case of sufficiently low result of overall migration test – or as a result of conservative estimation of the specific migration, e.g. by use of an approved migration modelling algorithm.



packaging

Varnish monomers and additives are restricted, e.g. BADGE, or banned, e.g. BFDGE and NOGE.

Screw caps

Glass bottles and jars with a screw cap offer food an utmost protection against contamination and microbial deterioration. But plasticisers in the PVC used in the lids as gasket are in public focus. PVC may contain up to 40 % softening agents:

Phthalic, adipic or sebacic esters, epoxidised native oils such as soybean (ESBO) or linseed oil (ELO), polyadipates, and many more. All these substances can migrate into packed food, especially into fatty food.

In regulation 10/2011 metal screw caps with plastic coating are regulated in line with other plastics. Overall migration of cans with such caps is limited to 60 mg/kg of food, and numerous plasticisers shall not exceed specific migration limits, e.g.:

- DEHP: 1.5 mg/kg
- DBP: 0.3 mg/kg
- BBP: 30 mg/kg
- DIDP + DINP: 9 mg/kg

Ceramic, glass, metal

Ceramic, glass

Ceramics and glassware may release significant amounts of lead and of cadmium. Limits for the release of lead and cadmium from ceramic utility articles are given in the European Directives 84/500/EEC amended by 2005/31/EC.

Metal

From time to time, cheap imported articles showed significant release of heavy metals such as chromium, nickel or zinc from household articles, e.g. cutlery, vacuum bottles, pots.

Migration limit values are found in a technical guideline of the European Council on "Metals and alloys used as food contact materials" and the European Directive 98/83/EC on drinking water. Even though a policy statement of the European parlia-

ment is not legally binding, these are accepted in some countries as state of knowledge.

Chemical Analyses

Eurofins Group offers fast and affordable testing of packaging in conformity with relevant European directives and ISO or EN standards:

- Overall and specific migration testing (EN 1186, EN 13130)
- Sensory evaluation on packaging material and unwrapped food (EN 1230, DIN 10955)
- Microbiological testing of packaging material and packaging containers (EN 1104)
- Colorants, formaldehyde, and many more substances in food packaging (EN 1541, 15136, 15320 and more)
- Plastic identification by FTIR-Spectroscopy

If successful, a certificate is issued confirming full compliance of the tested product with the relevant rules.

Performance Tests

Eurofins Group offers performance tests in accordance with internationally recognised testing standards, or tailored to each customers specific needs.

Here are just a few examples of such performance tests:

- Stability under load
- Stability when falling down
- Thermal stability
- Tensile strength
- Colour fastness (EN 646, EN 648)
- ...

Consulting

Eurofins offers the necessary consulting based on the specific product and application for fulfilling all legal requirements and any additional purchase specification.



Why select Eurofins as partner

- Eurofins provides end-to-end solutions that create value for our clients
- All competences in one Group - measurement, analyses, assessment, and consulting
- International network in more than 30 countries
- Flexible partner with major capacity and in time delivery
- High quality that complies with client's expectations and needs
- Employees with high qualification, experienced with international projects and all involved parties
- Work according to national and international standards, most methods are accredited (ISO/IEC 17025)
- No assignment is too small or too large
- Reasonable prices that are respected
- ... and our clients are guaranteed to have many more reasons



www.eurofins.com/migration-food

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