



## **BARRIER OF PRIMARY PACKAGING IN RESPECT OF COMPOUNDS COMING FROM SECONDARY PACKAGING**

### **AIM**

The aim of the study is the evaluation of the functional barrier:

- of a layer of material against compounds coming from the layers upstream;
- of a primary packaging against compounds coming from the outside, including secondary packaging

**IRCPACK** and **SEPACK LAB** developed a new protocol for the verification of the barrier effect applied to some situations of packaging for food.

In order to comply the functional barrier concept, the specific migration should be inferior to 0.01 mg/Kg (10 ppb) (ref. Article 13 of Regulation 10/2011/EU regarding to plastic materials intended to come into contact with food).

#### **STEP 1**

Identification of marker compounds in the "donor" and possible addition of markers if necessary

#### **STEP 2**

Preparation of migration tests with food simulants

#### **STEP 3**

Determination of markers migrated in the food simulants

# **IRCPACK**

Institute of Research and Consulting on PACKaging

[www.ircpack.com](http://www.ircpack.com)

## EXAMPLE

- Primary packaging: plastic film
- Secondary packaging: multilayer paperboard constituted by recycled fibers, printed and varnished

### STEP 1

#### Identification of marker compounds

The first phase of the study involves the identification of marker compounds used for the verification of the functional barrier of the plastic film into direct contact with food. If the presence of marker compounds in the secondary packaging is not significant for the study, they can be suitably added. In particular, addition of benzo-phenone (important marker for the evaluation). The analysis is performed by solvent extraction of the paperboard and analysis by GC/MS.

### STEP 2

#### Functional barrier testing

The assessment of the functional barrier is produced by setting up a migration test using a solid simulant (Tenax) by a special glass cell. It simulates a packaging consisting of a secondary packaging (cardboard), a primary packaging (plastic film) and the edible part (Tenax). Therefore, organic compounds possibly coming from paperboard and migrated through the film can be adsorbed by Tenax.

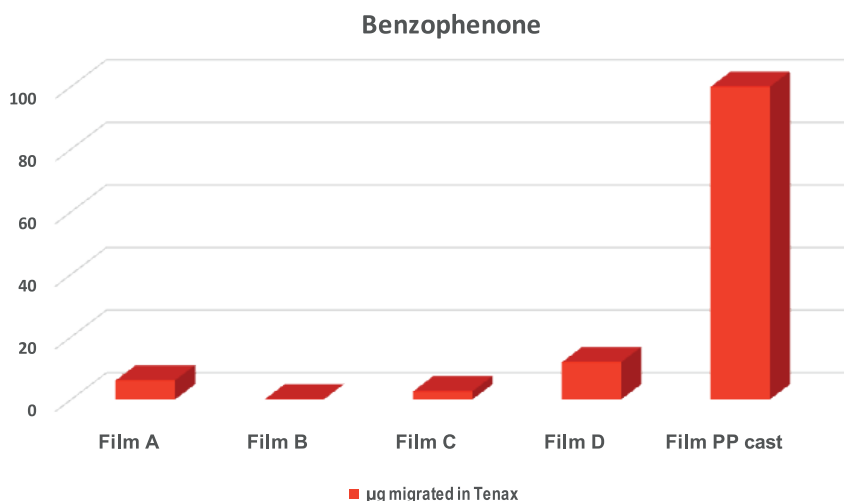
### STEP 3

#### Identification of marker migrated into Tenax

The objective of this phase is to determine the organic compounds (marker) migrated from packaging material to simulant Tenax to evaluate the barrier effect of the plastic film (primary packaging). The Tenax coming from contact with the sample is extracted with diethyl ether and analysed by GC/MS.

## IS YOUR PACKAGING A **FUNCTIONAL BARRIER** ?

The migrated quantity of benzophenone and/or other marker compounds determine the effect of functional barrier of several type of plastic film (primary packaging).



This study was carried out in Mara Baronciani's laboratory **SEPACK LAB S.R.L.** Presented to the 1<sup>st</sup> International Congress "Advances in the Packaging Industry Product and Process" - 20-19 November 2015 – Naples (ITALY).