

Sensory testing for Food Contact Material



A company to declare the compliance with Reg. (EC) n. 1935/2004 (Art. 3) has to demonstrate that the packaging *does not cause any organoleptic changes to the food.*



The risk assessment of the organoleptic contamination is carried out through sensory analyzes that allow to measure:

- *The packaging specific smell*
- *Its ability to change the taste of packaged foods*



Neutron possesses a full department called **Sen&CA** sensory and consumer analysis carrying out Sensory Analysis with the involvement of trained assessors panels.



The tests are carried out according to the methods provided by the following Standards:

- **UNI 10192:** Proceeding for the assessing of the possible organoleptic damage originated from food contact with the packaging
- **ISO 13302:** Methods for assessing modifications to the flavour foodstuffs due to packaging
- **DIN 10955:** Testing of packaging materials and packages for food products
- **UNI EN 1230-1 e 1230-2:** Paper and board intended to come into contact with foodstuffs – *Part 1. Odour – Part 2. Off-flavour (taint)*

In general, the standards indicate the use of food simulants that reproduce the characteristics of physical state, acidity, fat content, etc. of the food intended for contact, for example:



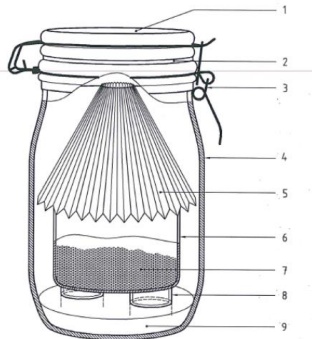
If the packaged food characteristics are unknown, you choose the worst condition by selecting a neutral taste simulant.

TYPE OF FOODSTUFF	SUGGESTED SIMULANT
Unfermented dairy products, thickened milks	Homogenized whole milk
Dairy products (yoghurt, soft white cheese, etc.)	Water + lactic acid
Liquid fatty products	Refined vegetable oil
Meat and meat-based processed products (cooked dishes) + cheese and butter	Margarine or butter
Dry biscuits and dry products with low fat content	Crushed rusks
Products containing more than 35% water (fruits, vegetables, beverages)	Water + citric acid + sugar (to be mixed in the same proportion as in the product to be simulated)
Alcoholic drinks	Water + Ethanol + glycerol
Chocolate, chocolate [by-] products and fatty biscuits. Dry fatty biscuits	Grated milk chocolate
Water	Odourless water

In taste tests, the **contact** between simulant and material can be **direct** or **indirect**.

In general, the **contact time** is *24-48h*, in temperature conditions indicated by the standard according to the type of simulant used and the intended use.

In the standard ISO 13302 the contact times recommended for the test purposes, depend on the expected storage times (product's shelf life), are as follows:



- Key
- | | |
|--|--|
| 1 glass lid | 6 glass crystallizing dish (diameter 8 cm) |
| 2 polytetrafluoroethylene [Teflon® 1] | 7 grated milk chocolate (25 g) |
| 3 metal dip | 8 glass rings |
| 4 glass jar (1 000 ml) | 9 saturated NaCl solution (60 ml) |
| 5 packaging material under test (8 dm ²) | |

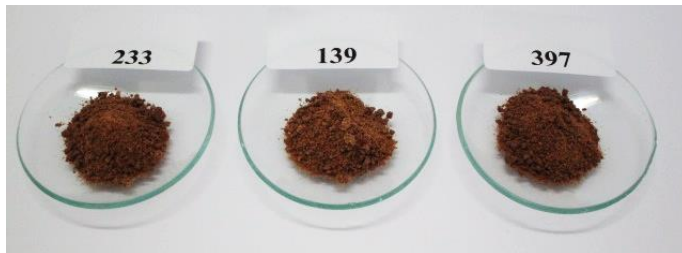
Figure 1 — Set-up for testing paper/corrugated cardboard

- **Short storage time** (*less than 1 month*) → **48 h**
- **Average storage time** (*from 1 to 9 months*) → **10 days**
- **Long storage time** (*9 months and over*) → **30 days**

Never less than 48h!




The procedures consist in putting a sample of packaging material in contact with a simulant and set up and store, in the same conditions, also a jar with only the simulant that will be used as *reference* (without off-notes).

After the phase of "conditioning", a panel of *assessors trained to sensory analysis*, assess and compare the taste perceived in the samples.



SENSORY TESTS

Hereby some sensory tests described in the standards:

- PAIRED COMPARISON TEST (ISO 5495)  Two samples are presented:
"Which one of the two samples is contaminated?"
The test is conducted with "**forced choice**" method.
- TRIANGULAR TEST (ISO 4120)  Three samples are presented:
two are the same sample and the third one is different
"Which is the different sample?"
The test is conducted with "**forced choice**" method.
- SCORING TEST  Two samples are presented:
for each sample, the assessors have to indicate the **intensity** of the smell perceived in the jar (olfactory test) and the intensity of the off taste perceived in the simulant.
They use an intensity scale.