DESIGN FOR RECYCLING GUIDELINES FOR THERMOFORMED PET PACKAGING

ECOSENSE FOUNDATION
RECYCLED & RECYCLABLE PET PACKAGING

January 2022

PACKAGING OPTIONS FOR THERMOFORMED PET CONTAINERS WITH BARRIER PROPERTIES ACCORDING TO THE FOOD TO BE PACKED

Level of barrier necessary for packaging	Packaged food	Material used			
		Thermoformed base		Container lid	
		Multilayer PET	Monolayer PET	Multilayer PET	Multilayer PO[3]
High barrier	Sliced cold cuts (slightly cured, cooked)[1]	✓	!	✓	✓
Medium - high barrier	Fresh meat[2]	✓	✓	✓	✓
	Fresh meat preparations[2]	✓	✓	✓	✓
	Fresh fish[2]	✓	✓	✓	✓
	Ready to eat foods	✓	✓	✓	✓
	White cheese	✓	✓	✓	✓
	Fresh pasta	✓	✓	✓	✓
Medium - low barrier	Cold cuts	✓	✓	✓	✓
	Sliced cold cuts (cured, dried)	✓	✓	✓	✓
	Sliced cheese	✓	✓	✓	✓
	Pre-prepared fruit and vegetables	✓	✓	✓	✓
	Long-lasting pastries	✓	✓	✓	✓

[1] For the packaging of food with preference consumption date from 20 days or more the use of multilayer PET with high barrier is recommended.

[2] When packaging is manufactured in monolayer PET more than 400 microns thickness is recommended.

[3] The multilayer PO is a double laminate formed by a layer of non-oriented polyolefins (inner packaging surface) and a layer of oriented polyolefins (outer packaging surface). In this type of lid, EVOH is not required for "Pre-prepared fruit and vegetables" and, depending on the type of product, usually not for "Long-lasting pastries" either.

✓	Option recommended as it meets food safety and conservation requirements
!	Possible option provided that some additional requirements are met to ensure necessary conditions of conservation (for example, with additives and/or recyclable masterbatches)

GUIDELINES ESTABLISHED BY PLASTIC SENSE FOUNDATION TO ENSURE THERMOFORMED PET CONTAINERS RECYCLING

Thermoformed base

Multilayer PET	Monolayer PET
❶ Transparent colourless sheet made of PET/PE ❷ No polyurethane glue should be used for bonding PET and polyolefin layers, use acrylate or acetate based adhesives instead. The adhesive should dissolve in caustic solution at 80ºC. ❸ It must not contain materials of similar density to PET (E.g. PVC, PVDC, HIPS). ❹ The barrier material must be laminated or incorporated to the polyolefin liner.	❶ Transparent colourless monomaterial PET sheet ❷ Preferably, do not use barrier components. If their use is inevitable, barrier components, either active or passive ones, should not have yellowness effect after oven test[3].

Container lid

Rigid lid	Flexible lid
❶ Transparent colourless PET must prevail in rigid lid weight with a thickness of over 150 micron. ❷ Lids made of materials with a density similar to that of the PET shall not be admitted (E.g. PVC, PVDC, HIPS) or multilayer PET lids using PU adhesives. ❸ In case the lid must contain a polyamide (PA), PETG or EVOH layer, its thickness must be below 35 micron and it must never be adhered to the PET layer by means of a PU adhesive. It is recommended to avoid using PETG (glycol-modified PET), as it hinders container recyclability and reduces the properties of the recycled material. ❹ The PET of the lid must be transparent (point 1). .- Should it be necessary to add printed opaque elements, the ink layer must preferably go in a separate layer, polyethylene or PA for instance. In case of the ink layer should be directly printed in the PET layer, it should be projected in nitrocellulose-based or water-based ink and preferably on the external surface. .- One option could be using a paperboard blister pack which includes all the required information for consumers, being necessary for the consumer to separate the plastic packaging from the blister to be able to consume the product. In this way, separation of the blister pack with inks of the transparent thermoformed base and lid will be very easy and recyclability shall be guaranteed: the blister pack can be deposited in the blue paper and cardboard container[1], whereas the transparent thermoformed base and lid, when separated, can be deposited in the yellow light packaging container[2].	❶ The average density of the lid as a whole must be below 1, except in the case of non printed mono PET lids. ❷ Flexible printed mono PET lids are not allowed because their separation of the main flow of PET flakes is not possible and, among some of the consequences, they decrease the mechanical and optical properties of the recycled product. It is recommended to use PE as the majority material by weigh and not exceed 5% of barrier polymers. ❸ It is recommended to keep the lid weight to the minimum. For this purpose, biaxially oriented polypropylene (BOPP) may replace biaxially oriented PET (BOPET) in the case of structures of multilayer PET. In this way, the lid density can be reduced. ❹ It is recommended to include instructions on the package, easily visible and readable for consumers to detach (completely unstick) the flexible lid from the thermoformed base and to deposit the thermoformed base and the flexible lid separately in the yellow light packaging container[2].
❺ The lid-base adhesive must not harm the recycling process, for that it must comply with the corresponding removal test[4]. Resealable adhesives (e.g. Copolyester, hot melt) do not show recyclability issues, as they delaminate easily.	

Other elements of the package

❶ Labels made of PET, PETG or any other material of similar density to PET are not allowed (e.g. PVC, PVDC, HIPS).
❷ Avoid, if possible, adhesive paper labels because the final product can be contaminated with cellulose fibers. Polyolefins labels of acrylate base adhesives are more recommended.

[1] The color of the paper and cardboard waste container may differ from a country to another. In Spain, for example, it is blue.

[2] The color of the light packaging waste container may differ from a country to another. In Spain, for example, it is yellow.

[3] The "Oven Test" protocol (Quick test QT 500) from the European PET Bottle Platform (EPBP) must be followed for this test which conditions, regarding time and temperature (60 min at 220°C), are the same of that included on the UNE-EN-ISO 15348.

[4] The "Glue Separation Test" protocol from the EPBP (Quick test QT 504) must be followed for this test.

January 2022.5 version