RecyClass

c/o Plastics Recyclers Europe
Avenue de Broqueville 12
1150 Brussels, Brussels

Phone: +32 2 786 39 08
info@recyclass.eu
www.recyclass.eu

RECYCLASS TECHNICAL REVIEW

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The RecyClass PET Thermoforms Taskforce (TF) investigated the effect of the presence of soaker pads and labels on the sorting behaviour of PET Trays. The testing campaign was supported by both Klöckner Pentaplast and Avery Dennison while the tests were performed by Circpack at the Ochtendung (Germany) industrial sorting centre. Following these tests, the RecyClass PET Thermoforms TF delivered new design recommendations regarding the compatibility of soaker pads and labels with PET Thermoforms recycling.

The objective of the test campaign was to better understand how common features present on PET Trays could affect the detection of PET by Near Infrared (NIR) sorters. The study focused on the impact of the surface coverage on PET trays for both soaker pads and labels. A range from 20 to 50 % coverage of the back of tray was considered, to align with markets conditions. For labels, three different facestocks were considered: Polypropylene (PP), Paper, and Direct Thermal Paper (DTP). Three groups of samples were tested: Group 1) only labels, Group 2) only soaker pads, Group 3) real case packaging from the market with combinations of labels and soaker pads, or printed labels and lids (see Annex I).

Both static and dynamic sorting tests were performed to analyse the level of detection of PET trays by NIR sorters. The samples were virgin and unused (e.g. no product residues or cross-contamination) and were tested on both sides to evaluate if the label or the soaker pad would be hindering PET NIR detection. For all labelled samples (Group 1), the PET was perfectly detected in both bottom and top orientations of the tray, with no sign that labels were hindering the detection of the underlying PET material. For the soaker pads (Group 2), the trays could be well identified as PET-based material, but PET could not be detected through the soaker pads when NIR detection was done from top view. Therefore, the well detection and identification of the PET tray is directly depending on the size of the soaker pads and its coverage compared to the surface of the back of the tray. Finally, the market samples (Group 3) showed results aligned with the previous investigations, with printed labels not affecting the detection of the underlying PET tray, and soaker pads reduce the surface of detection of PET. Besides, lidding films, even if weakening the detection of the PET tray, did not hamper the positive identification of the PET.

Based on the findings from the sorting tests, the RecyClass PET Thermoforms TF has decided to update the following Design for Recycling recommendations for the PET Thermoform streams:

For the soaker pads:

- Full compatible: PET Trays with pores enabling liquid retention (no soaker pad)
- Limited compatible: Soaker pads with coverage less than 50% of the back of the tray (sorting test mandatory above 50% coverage)

For the labels:

- Full compatible: Labels in PE; PP; OPP (all with density < 1g/cm^3) on lids, or with coverage less than 50% of the back of the tray (<50% coverage)
- Limited compatible: BPA-free paper labels without fibreloss during recycling process applied on lids, or with coverage less than 50% of the back of the tray. Labels with a coverage >50% (sorting test mandatory)

Note that other recommendations can apply regarding the material used for the soaker pads or labels. Besides, it remains crucial to use an adhesive that can be washed-off at 70°C under aqueous washing conditions used by PET Thermoforms recyclers.

As a matter of clarity, the coverage of labels or soaker pads should be measured according to the following formula:

$$\text{Coverage} = l*w / L*W$$

With,

l and w corresponding to the length and width of the label or soaker pad, respectively;

L and W corresponding to the length and width of the PET tray, respectively, as defined on Annex II.

Contact: jean-emile.potaufeux@plasticsrecyclers.eu, www.recyclass.eu

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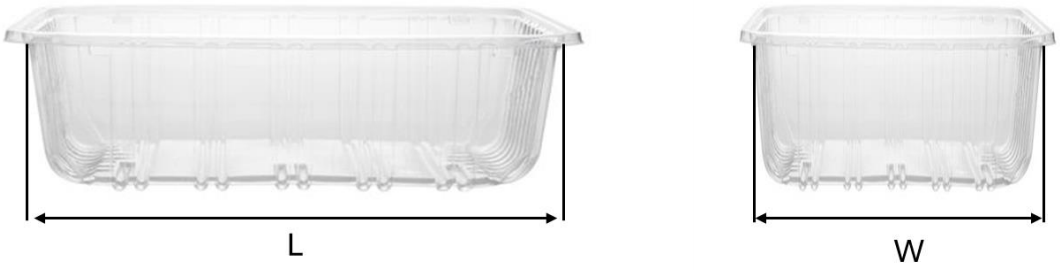
Annex I

Table 1: Pictures of the five Innovation pellets in comparison with the control

Group	Code	Tray	PP label	Paper label	Direct thermal paper label	Soaking pad
			in mm²			
Control	Control-R13	R13	-	-	-	-
	Control-R2	R2	-	-	-	-
1	Label-PP-20	R13	160*41	-	-	-
	Label-PP-30	R13	160*62	-	-	-
	Label-PP-50	R13	160*103	-	-	-
	Label-Paper-20	R13	-	160*41	-	-
	Label-Paper-30	R13	-	160*62	-	-
	Label-Paper-50	R13	-	160*103	-	-
	Label-DTP-20	R13	-	-	160*41	-
	Label-DTP-30	R13	-	-	160*62	-
	Label-DTP-50	R13	-	-	160*103	-
2	Pad-30	R13	-	-	-	120*80
	Pad-39	R2	-	-	-	120*80
	Pad-50	R2	-	-	-	140*90
3	Market sample #1	Unknown	-	-	100*60	-
	Market sample #2	Unknown	-	-	108x65	100*110
	Market sample #3	Unknown	-	-	108x65	100*110

Annex II



Picture 1: Visual help to measure soaker pads and labels coverage