



GENERAL NOTICE 83

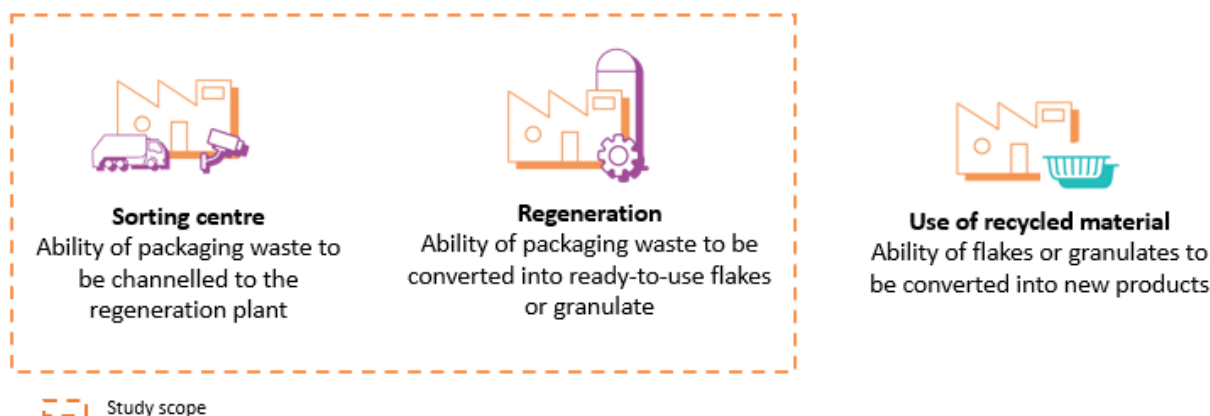
Impact of clear PET trays with absorbent pads on the sorting and regeneration of pots trays and other rigid packaging items made of clear PET

SUMMARY

The aim of this general notice is to assess the sorting and mechanical regeneration potential of clear PET pots and trays containing absorbent pads.

Absorbent pads are mainly used in the bottom of food trays to absorb exudate, the juice released from meat, poultry or fish. They generally consist of two PE layers surrounding a layer of cellulose, and are stuck to the tray with a spot of adhesive.

This notice does not concern absorbent pads used for fragile fruit (similar to bubble padding), which are made with a different production technique and differ in composition.



During the optical sorting stage, depending on its coverage rate, an absorbent pad can prevent packaging from being detected correctly¹. Sorting tests determined that the presence of an absorbent pad covering no more than 70% of the surface of the tray bottom does not affect detection.

Pilot-scale regeneration tests were then conducted to assess the impact of this packaging on mechanical recycling. Results obtained show that the presence of an absorbent pad disrupts certain stages of the mechanical regeneration process for clear PET pots and trays. Observations made during the washing stage revealed that the water turns viscous and cloudy, and equipment is affected, sometimes leading to failure.

Given the current state of equipment and sorting and regeneration techniques available in France, the use of absorbent pads consisting mainly of cellulose and PE in a clear PET tray is incompatible with the stream for pots trays and other rigid packaging made of clear PET²

COTREP may review this notice in light of developments in sorting and recycling technologies, markets, or quality requirements for recycled material.

¹ The coverage rate corresponds to the ratio between the absorbent pad surface and the surface of the tray bottom.

² For simplification purposes, the term "tray" used in this document refers to all rigid packaging excluding bottles and dispenser bottles, such as pots for example

1. CONTEXT

Absorbent pads are used to absorb exudate, the juice released from meat, poultry or fish. They generally have the following composition (standard design, non-exhaustive): PE/adhesive/cellulose/adhesive/PE. Some manufacturers also use super absorbent fibre (or SAF) pads combined with cellulose for more efficient absorption, or microporous material.

Absorbent pads are mainly assembled by gluing to the tray: adhesive is automatically applied on the thermoforming line, or else with a specific machine. Ultrasound sealing also exists but is still uncommon, and there is a risk of piercing the tray. Lastly, assembly without either adhesive or sealing is very rare as the absorbent pad could become detached during the different steps of the process (tray unstacking or in the consumer's home when the pad remains stuck to the meat).

PET trays with absorbent pads account for approximately 2% of mono-PET tray tonnage, i.e. approximately 887 tonnes.

This notice seeks to assess the impact of using absorbent pads in PET trays on detection by optical sorting and mechanical regeneration of the stream of pots, trays and other rigid packaging items made of clear PET.

2. IMPACT ON OPTICAL SORTING

The impact on optical sorting study consisted of assessing the impact of the absorbent pad and certain parameters (colour, coverage rate) on the detection of clear PET trays from household packaging waste.

Static and dynamic optical sorting tests were performed on the premises of optical sorting equipment manufacturers Tomra and Pellenc ST, with several samples of packaging representative of the market of absorbent pads in clear PET food trays. The aim was to determine the parameters that could prevent the packaging from being correctly detected and channelled to its target recycling stream.

2.1. Test samples

Tests were performed on several types of clear PET trays with absorbent pads representative of structures available on the market. Five samples were tested with the following characteristics:

- Tray colour: crystal
- Coverage rate between 40% and 90%
- Absorption capacity: 0.8, 2.5 and 3 L/m²
- Absorbent pad colour: white, transparent, red
- Pad placement method: spot of adhesive
- Adhesive not detachable during washing

The test samples did not contain food residue.

2.2. Results of static optical sorting tests

The packaging was positioned beneath the optical sorting machine with near infrared (NIR) technology. The static tests were performed with dry absorbent pads, absorbent pads soaked in water (to represent an absorbent pad soaked in exudate), on the top side (absorbent pad visible), on the underside (absorbent pad beneath the tray) and with the absorbent pad folded in two (absorbent pad inside). The results were as follows:

- ⇒ In all tested configurations, samples with a coverage rate lower than 70% were successfully detected as PET trays and the absorbent pads did not affect detection.

2.3. Results of dynamic optical sorting tests

COTREP provided pilot sorting lines with a rigid packaging stream from French sorting centres. The dynamic tests were performed on trays with dry absorbent pads only. 100 samples of clear PET trays with absorbent pads were injected into the packaging stream from French sorting centres. The machines were set to eject packaging to the stream for clear PET pots and trays (target stream) based on the standard settings used in French sorting centres. The results were as follows:

- ⇒ The results showed that over 90% of the tested packaging items with absorbent pads whose coverage rate was lower than 70% were successfully directed to the stream for clear PET pots and trays. In contrast, less than 40% of trays with absorbent pads whose coverage rate was higher than 70% were correctly directed.

IMPACT OF PET TRAYS WITH ABSORBENT PADS ON OPTICAL SORTING PROCESSES



No impact on optical sorting; the PET trays with an absorbent pad whose coverage rate was lower than 70% were correctly directed to the stream for clear PET pots and trays.

To ensure that packaging is directed to the appropriate recycling stream, the absorbent pad should not exceed 70% coverage. You are recommended to work with the smallest possible coverage rate to meet optical sorting capture requirements and reduce material use.

3. IMPACT ON REGENERATION

3.1. Principle and analytical criteria

In its recyclability study, COTREP assessed the impact of absorbent pads on the mechanical regeneration process for clear PET pots and trays.

Since there is no specific COTREP protocol for pots, trays and other rigid PET packaging items, pilot-scale regeneration tests were performed based on: a protocol drawn up by COTREP for recycling PET bottles and dispenser bottles; the TCEP³ assessment protocol; and mechanical regeneration practices applied by industrial operators receiving French clear PET pot and tray streams.

Various criteria (process behaviour, physical-chemical criteria) were measured during the test phases and compared to those of a standard sample composed of 100% clear PET trays.

3.2. Test samples

Tests were performed on two clear PET tray references with absorbent pads representative of structures available on the market.

The test samples did not contain food residue and the absorbent pads were dry.

The standard stream for the study consisted of clear PET trays without absorbent pads.

Tests were performed with 2% and 16% PET trays with absorbent pads by mass to account, respectively, for estimated volumes currently placed on the market and an estimate reflecting trends observed for PET trays with absorbent pads placed on the market.

³ Tray Recyclability Evaluation Platform

3.3. Results

IMPACT OF ABSORBENT PADS ON CLEAR PET POT AND TRAY REGENERATION PROCESSES

RECYCLING PROCESSES	IMPACT	DESCRIPTION
 SHREDDING		No impact on shredding
 WASHING, FLOTATION AND DRYING		Above a proportion of 2%, the presence of absorbent pads has an impact on washing, flotation and spinning: ⇒ Cloudy water with a viscous appearance ⇒ Centrifugal dryer drum clogged due to the presence of fibres, with jamming of equipment at 16%
 AERAILIC SORTING		No impact on aerailic sorting
 EXTRUSION/ GRANULATION	N/A	Stage not carried out*
 APPLICATION	N/A	Stage not carried out*



Caution



No impact

*Tests carried out on the impact of absorbent pads on regeneration processes for pots, trays and other rigid PET packaging items revealed jamming of equipment during the washing/flotation/drying stage. Since the pass criterion was not met, COTREP decided not to perform the subsequent steps (extrusion/granulation, then application).

TECHNICAL CONCLUSIONS

Through tests performed by COTREP, it was possible to assess the impact of clear PET trays with absorbent pads on sorting and mechanical regeneration of pots, trays and other rigid packaging items made of clear PET.

Sorting tests determined that the presence of an absorbent pad covering no more than 70% of the tray surface does not affect detection by optical sorting. Pilot-scale regeneration tests were then conducted to assess the impact of this packaging on mechanical recycling. Results obtained show that the presence of an absorbent pad disrupts certain stages of the mechanical regeneration process for clear PET pots and trays. Observations made during the washing stage revealed that the water turns viscous and cloudy, and equipment is affected, sometimes leading to failure.

Given the current state of equipment and sorting and regeneration techniques available in France, the use of absorbent pads consisting mainly of cellulose and PE in a clear PET tray is incompatible with the mechanical regeneration of pots, trays and other rigid packaging items made of clear PET.

COTREP may review this notice in light of developments in sorting and recycling technologies, markets, or quality requirements for recycled material.