COTREP

Comité Technique pour le Recyclage des Emballages Plastiques

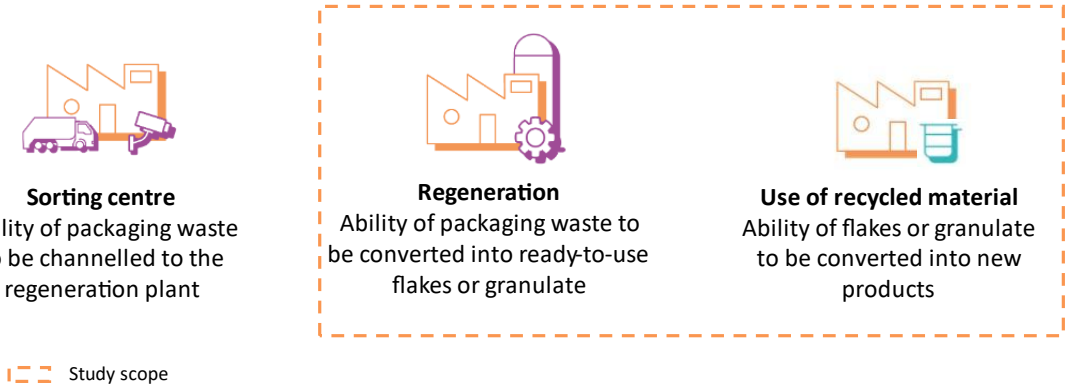
Resin
Rigid PS

GENERAL NOTICE 85

Impact of paper bands on the regeneration of rigid PS packaging

SUMMARY

The aim of this general notice is to assess the mechanical regeneration potential of household rigid PS packaging with a paper band.



Yoghurt pots account for a large amount of packaging in the PS stream. Currently, these pots are mainly bundled with a full paper band. During sorting stages, this paper band cannot be separated and a large amount of paper ends up in the PS stream. COTREP tested the impact of this packaging on regeneration of the rigid PS stream.

The results of tests carried out on the premises of an industrial operator handling this stream show that **the presence of paper bands on PS yoghurt pots given the quantities currently on the market directly impacts regeneration efficiency but does not affect the different stages in the process or the quality of regenerated material. It is hence preferable to limit the quantity of paper to be used to ensure recovery of a greater proportion of recyclable PS.**

In conclusion, given the current state of the market and regeneration equipment and techniques available for the PS stream arriving from French sorting centres, rigid PS packaging with **a full paper band** offers **limited compatibility** in the rigid PS stream, and rigid PS packaging with **a partial paper band** offers **partial compatibility** in the rigid PS stream.

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

1. CONTEXT

Paper bands are commonly used on PS yoghurt pot packaging for information and communication purposes. They also help to improve the vertical compression strength of PS pots with a density of between 0.8 and 1, thus facilitating palletising and transport.

Rigid PS packaging with a paper band represents 60% of the tonnage of fresh dairy products placed on the market. The majority of this packaging includes full bands covering more than 50% of the surface area. This rigid PS packaging with paper banding accounts for roughly 38.5% of overall PS tonnage (excluding EPS).

The paper bands are heat-sealed to the PS pots; they are therefore collected and sorted in the rigid PS stream.

This notice seeks to assess the impact of the paper band on mechanical regeneration of the rigid PS stream and the quality of regenerated material.

2. IMPACT ON INDUSTRIAL SCALE REGENERATION

2.1. Principle and analytical criteria

In its recyclability study, COTREP assessed the impact of the paper band on the regeneration process and quality of rPS[1] produced from French rigid PS household packaging.

The regeneration tests were conducted on an industrial scale at a regeneration plant processing French rigid PS household packaging streams. Experimental conditions were defined to be representative of the industrial line and with sufficient quantities so that any impacts could be observed in comparison with a standard stream.

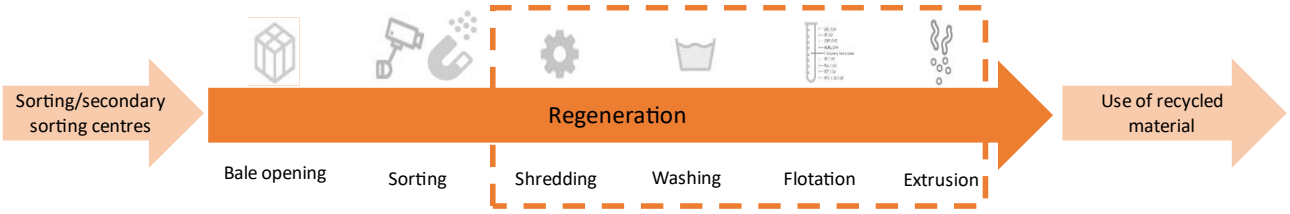


Figure 1: Analytical scope of the regeneration impact study

Various physical-chemical criteria were measured during the test phases and compared to those of a standard sample composed of 100% rPS produced from French household packaging.

The technical characteristics of the regenerated material were assessed on injection moulded specimens.

2.2. Test samples

Tests were performed on rigid PS pots with a density of between 0.8 and 1 bundled with a full paper band. This structure is representative of the structures available on the market.

A market survey estimated that PS pots with a full paper band contain a paper mass of roughly 28%. These parameters were considered in the choice of test samples.

To isolate the issues and test solely the impact of the paper bands, we used unlidded samples. The test samples did not contain food residue and were unsoiled.

The standard stream is a stream of French rigid PS household packaging waste from a secondary sorting centre, already containing a proportion of banded PS pots.

Tests were performed with 38.5% PS pots with paper bands by mass introduced into the standard stream. This proportion corresponds to the current estimated marketed volumes.

[1] rPS means recycled material from rigid PS packaging

2.3. Results

IMPACT OF PAPER BANDS ON RIGID PS REGENERATION PROCESSES

REGENERATION PROCESSES	IMPACT	*DESCRIPTION*
SHREDDING	✓	*No impact on shredding*
WASHING AND SPINNING	⚠	*No impact on the plastic fraction during washing and spinning* ➔ *Significant quantity of paper eliminated, impacting efficiency*
SORTING BY DENSITY	✓	*No impact on flotation and drying*
EXTRUSION/ GRANULATION	✓	*No impact on extrusion/granulation*
INJECTION MOULDING OF SPECIMENS:	✓	*No impact during standard specimen injection moulding*

⚠ Caution ✓ No impact

TECHNICAL CONCLUSIONS

Through tests performed by COTREP, it was possible to assess the impact of rigid PS packaging with a paper band on mechanical regeneration of rigid PS household packaging.

The results of tests carried out on the premises of an industrial operator handling this stream show that **the presence of paper bands on PS yoghurt pots given the quantities currently on the market does not affect the different stages in the process or the quality of regenerated material.** However, the high amount of paper in the stream directly impacts process efficiency due to a reduction in incoming plastic. **It is hence preferable to limit the quantity of paper to be used to ensure recovery of a greater proportion of recyclable PS.**

In conclusion, given the current state of the market and regeneration equipment and techniques available for the PS stream arriving from French sorting centres, rigid PS packaging with **a full paper band** offers **limited compatibility** in the rigid PS stream, and rigid PS packaging with **a partial paper band** offers **partial compatibility** in the rigid PS stream.

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