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FACT SHEET
IMPACT OF PACKAGING ON CURBSIDE RECYCLING COLLECTION AND RECYCLING SYSTEM

Éco Entreprises Québec

PET BOTTLE with PVC sleeve-label

Introduction

The recovery and recycling stream for polyethylene terephtalate (PET) plastic bottles is well established in Quebec. Rates of recovery through curbside recycling collection are high, sorting the material is relatively easy for sorting centres, sorted material is worth several hundred dollars per tonne and there are business opportunities for its sale to recyclers.

The recent introduction of polyvinyl chloride (PVC) sleeves threatens this stream. As illustrated, the sleeves are used as a type of adhesive-free label that shrinks to the shape of containers. Keeping in mind Quebec's current system, the following table demonstrates the impact and consequences of using PVC sleeves on PET bottles. Consequences are both environmental and operational, therefore generating negative economic costs.

Summary Table

	STEPS	LEVEL OF IMPACT	IDENTIFIED IMPACTS	IDENTIFIED CONSEQUENCES
CURBSIDE RECYCLING COLLECTION	Collection and transportation	○	None	None
	Sorting centre operations	○	None	None
	Sorting			
	- manual	○	None	None
	- mechanical	○	None	None
	- optical	◑	• Increase in the percentage of bottles going into the wrong streams or being rejected due to equipment used	• Fewer PET bottles recycled • Contamination of other types of recyclable materials
CONDITIONING AND RECYCLING	Grinding and washing	○	None	None
	Additional sorting	◑	• Sorting by material density is ineffective for the sorting of PET bottle from PVC sleeve	• Requires special equipment
	Plastics processing	●	• Mechanical and chemical degradation of PET bottle due to low concentrations of PVC	• Lower quality resin produced by the recycling of PET bottles (black spots, discolouration)

LEGEND: ○ No impact ◑ Caution (uncertainty or complication) ● Problem

Recommendation

ÉEQ's research, available external studies and expert opinions all indicate that PVC sleeves have impacts on curbside recycling collection and recycling of PET bottles. The impacts identified in the summary table provide the basis for the following recommendation:

ÉEQ recommends avoiding the use of PVC sleeve-labels on PET bottles given the current state of Quebec's curbside recycling collection and recycling system.

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Additional information

PET bottle with PVC sleeve-label

ÉEQ's directory of fact sheets is growing and will soon contain recommendations on other types of sleeve-labels. Other than PVC, there are types of plastics that may be used for sleeves, such as oriented polypropylene (OPP) or low-density polyethylene (LDPE).

Impacts shown on the summary table

OPTICAL SORTING

Optical sorting equipment is used by some Quebec sorting centres to separate plastic packaging according to component materials. Some equipment may not correctly identify bottles with sleeve-labels due to the presence of combined materials. For any type of optical sorting equipment, dealing with combined materials increases the risk of PET bottles going into the wrong streams or being rejected [Expert opinions]. It should be noted that when recyclable materials are compacted in the collection and transportation process, most sleeves detach from the bottles, therefore facilitating optical sorting [Expert opinions].

ADDITIONAL SORTING

Sink/float tank separation is a sorting technique used by recyclers to separate materials with a lower density than that of water (and therefore float) from those that have a higher density than water. As both the PET from bottles and PVC from sleeves are more dense than water, they cannot be sorted by sink/float tank separation [External studies]. Additional equipments are necessary to cope with this matter and, therefore increase the costs of additional sorting.

PLASTICS PROCESSING

"Black spots" show up in PET that is contaminated with PVC, and the mechanical and chemical properties of the material are changed, even in the presence of low PVC concentrations. Quebec recyclers have informed ÉEQ that maximum concentration of PVC in PET is 50 ppm [Experts opinions]. A study conducted by Paci et al. (1999) showed that 100 ppm of PVC in recycled PET bales may increase its degradation and discolouration (Naït-Ali, 2008) [External studies].

Main references

Association of Postconsumer Plastic Recyclers (2009) *Design for Recyclability Guidelines*, viewed on July 28, 2010, http://www.plasticsrecycling.org/technical_resources/design_for_recyclability_guidelines/index.asp

Comité Technique de Recyclage des Emballages Plastiques (2004) *Avis génera l- Étiquettes et manchons PVC sur bouteille PET*, COTREP, viewed on December 16, 2010, http://www.cotrep.fr/fileadmin/contribution/mediatheque/avis-generaux/francais/etiquettes-et-manchons/FT08-etiquette-PVC-sur-bouteille-PET.pdf

NAÏT-ALI, Kako Linda (2008) *Le PET recyclé en emballages alimentaires : approche expérimentale et modélisation*, Doctorate thesis on the chemistry of materials, Université Montpellier II, viewed on November 16, 2010, 220 p. http://tel.archives-ouvertes.fr/docs/00/29/20/38/PDF/these_naitali_300408.pdf

PACI, M. and LA MANTIA, F.P. (1999) "Influence of small amounts of polyvinylchloride on the recycling of polyethyleneterephthalate", *Polymer Degradation and Stability*, vol. 63, n°1, p.11-14.

Recoup (2009) *Plastics Packaging - Recyclability by Design*, 2009 revised edition, viewed on September 24, 2010, http://www.recoup.org/design/docs/202July_09_APR_endorsement_RBD.pdf

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