

**Hot Beverage Cup  
Acceptability &  
Recyclability in  
the Ontario Blue  
Box Program**





Stewardship Ontario

## **Acknowledgements**

This project has demonstrated the value of multi-stakeholder collaboration and partnerships when it comes to understanding and identifying ways to address the challenges of collecting, processing and marketing materials in a sustainable manner.

We gratefully acknowledge and thank Tim Hortons, the Carton Council of Canada and Emterra for their collaboration in this multi-phased project.



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## Executive Summary

Canadians love their coffee. According to a recent report, which compiled statistics on coffee consumption in 80 countries, Canada ranks number three for the total amount of brewed coffee consumed inside and outside the home.<sup>1</sup>

Outside the home, coffee is most often served in a plastic-laminated paper cup, known in the industry as polycoat cups. Polycoat cups are also commonly used for fountain pop, slushies and frozen yoghurt. While the material is a valuable source of high-quality paper fibre, there are still challenges when it comes to recycling it. In Ontario, some municipalities collect the cups as part of the Blue Box Program, whereas others do not. In 2014, approximately 13 per cent of Ontario's population had access to recycling services for hot beverage cups.<sup>2</sup>

However, a number of groups are working to divert more polycoat cups from landfill as well as identifying and developing commodity markets for the material. Industry stewards, municipalities, waste management companies, industry organizations and Stewardship Ontario have been looking for ways to more effectively and efficiently recycle polycoat cups and create good long-term environmental and economic solutions for managing this material.

Over the past seven years, Stewardship Ontario and its partners have undertaken a range of studies that have examined how to improve:

- the collection of polycoat cups.
- sorting in material recovery facilities (MRFs).
- milling and commodity markets.

Some of the studies referred to in this report included a broad range of composite paper packaging – including gable-top and aseptic containers, polycoat cups, spiral wound containers and bleached long fibre polycoat. Most of these materials were sorted accurately in MRFs, but, until recently, there remained particular challenges with sorting hot beverage polycoat cups.

**The results of the studies demonstrate that we have successfully:**

- Increased capture rates of polycoat cups within pilot communities by 22 per cent.**
- Tested and proven new MRF optical sorting technology that captures 90 per cent of polycoat cups without compromising the commodity output.**
- Identified stable markets for processing polycoat cups in North America and overseas.**

## Conclusion

There is evidence to suggest that local governments can proceed with the addition of polycoat cups to their recycling programs with the assurance that the majority of cups will be recycled. However, we strongly urge that prior to making such a decision, local governments ensure that the necessary sorting technology is employed in their MRFs and that their end markets will process the polycoat

<sup>1</sup> Euromonitor International. (2016) *Coffee in 2016: From Premium to Luxury*

<sup>2</sup> CM Consulting. (2014) *Access to Residential Recycling of Packaging and Packaging Materials in Canada* – Report submitted to Canadian Stewardship Services Alliance.



cups rather than treating them as residue. Local governments are also advised to contact their end markets for PSI-52 to ensure that any bales containing polycoat cups in excess of the three per cent outthrow threshold will not be downgraded or rejected as a result.

## Collecting the cups

Hot beverage cup collection by Ontario municipalities varies widely. At the time of writing this report, some municipalities instruct residents to put the cups in the garbage stream, while others encourage residents to put them in the Blue Box. In 2012, a small study was conducted in Halton Region to look at the feasibility of Blue Box collection of cups.<sup>3</sup> Residents were instructed to place coffee cups in their Blue Boxes, whereas prior to the pilot, residents had been told to dispose of them in the organics collection system.

The pilot resulted in:

- An increase in the proportion of cups in the Blue Box from 45 per cent to 55 per cent, representing a 22 per cent increase in the capture rate.
- A decrease in the proportion of cups found in organics collection from 19 per cent to 15 per cent, representing a 21 per cent decrease in this stream.
- A decrease in the proportion of cups found in the garbage from 36 per cent to 30 per cent, representing a 17 per cent decrease in this stream.

## Sorting polycoat cups at the MRF

The effective sorting of hot beverage cups in MRFs remains a challenge. Unlike gable-top and aseptic containers which are coated on the inside and outside with polycoat, coffee cups are coated only on the inside with polycoat. Frequently, by the time the cups pass through the optical equipment, they are flattened, providing the optical sorter with limited exposure to the polycoat surface and making it difficult for optical sorters to detect the cups. As a result, chances of detection are drastically reduced.

The challenges faced during material sorting were highlighted in two studies. As part of a broader strategy to divert from waste and recycle a larger amount of hot beverage cups, the City of Toronto found that optical sorting equipment at existing MRFs could not separate hot drink cups from other materials.<sup>4</sup>

The Ontario Carton Expansion Project<sup>5</sup> tested optical sorting effectiveness at four Ontario MRFs and found that, without specialized programming, optical sorters were not able to effectively detect and sort hot beverage cups. Optical sorter test results showed that only two per cent of the cups at Emterra Halton were being sorted to the polycoat stream.

Subsequent phases of the project focused on improving sorting results by reprogramming TITECH optical sorting equipment to more precisely identify the cups. Refinements to the equipment

<sup>3</sup> *Hot Beverage Paper Cup Recycling Final Report*. (2013)

<sup>4</sup> Kelleher Environmental. (2009) *City of Toronto Hot Drink Cup Strategy – Research on Behaviour Change*. Toronto, ON. [http://kelleherenvironmental.com/wp-content/uploads/2012/07/kell\\_env\\_hot\\_drink\\_report\\_behaviour\\_change.pdf](http://kelleherenvironmental.com/wp-content/uploads/2012/07/kell_env_hot_drink_report_behaviour_change.pdf)

<sup>5</sup> *Ontario Carton Expansion project*. (2014) [http://www.recyclecartons.ca/wp-content/uploads/2015/06/SPC-Advance\\_Sept2014\\_Presentation.pptx](http://www.recyclecartons.ca/wp-content/uploads/2015/06/SPC-Advance_Sept2014_Presentation.pptx)



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programming showed that 90 per cent of the hot beverage cups were correctly captured to the polycoat stream. Notably, the reprogramming of the equipment did not significantly affect the purity rate of the sorted polycoat material with 92 per cent of the total composition consisting of polycoat materials

## Processing polycoat cups

Effective sorting processes and technologies are vital in the preparation of materials for sale as commodities. Even so, while polycoat cup end markets are available, they are limited and processing the materials continues to be a challenge for some mills. The following summarizes the work that has been done to understand and expand mill capacity and extend markets for hot beverage cup polycoat.

**Note:** This section refers to PSI-52, a commodity grade for post-consumer aseptic and gable-top cartons, which may include up to three per cent outthrows and up to five per cent of outthrows and prohibitive combined.<sup>6</sup> Some end markets will consider polycoat cups as target polycoat material and others may treat them as outthrows.

The equipment available in a mill is a factor in the facility's capacity to adequately process hot beverage cups. In 2011, a contingent from Ontario visited the SFK/FibreK mill in West Virginia (now called Resolute), which was using a hydropulper for "wet-strength materials" including aseptic, gable-top and ice cream containers, and polycoat beverage cups. The facility yield averaged around 70 per cent with these materials processed in the batch pulper.

The Ontario Composite Paper Packaging Recycling Research Study<sup>7</sup> found that the typical end market for the polycoat material continues to be mill facilities with hydropulpers. The same study found that limited end markets are available, but challenges remain including the mill's ability to remove ink from dark-coloured cups. It is possible that the inclusion of polycoat cups in the PSI-52 grade bale may limit end markets to those that can effectively manage their unique processing challenges.

Developing markets and demand in North America for post-consumer polycoated cartons has been the focus of concerted efforts by the Carton Council for a number of years. In 2011, the adoption of the new commodity grade PSI-52 by the Institute of Scrap Recycling Industries (ISRI), along with the work of the Council led to an increase in the number of mills in North America accepting polycoated cartons.<sup>8</sup>

Mill testing done as part of the Ontario Carton Expansion Project<sup>9</sup> found that milling samples of cartons/PSI-52 grade plus hot beverage cups provided a comparable fibre yield and pulp quality as to milling only cartons.

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<sup>6</sup> Institute of Scrap Recycling Industries, Inc.. *Scrap Specification Circular* (2016): 31, <http://www.isri.org/docs/default-source/commodities/specupdate.pdf>.

<sup>7</sup> Kelleher Environmental. (2011) *Ontario Composite Paper Packaging Recycling Research Study*. Toronto, ON. <http://stewardshipontario.ca/wp-content/uploads/2013/03/SO-Comp-Paper-Pkg-Draft-Rep-12April2011.pdf>

<sup>8</sup> Carton Council. (2012)

<sup>9</sup> *Ontario Carton Expansion project*. (2014)



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Most recently, Stewardship Ontario commissioned a review of the current market for the inclusion of hot beverage cups in the PSI-52 grade.<sup>10</sup> The study, which was based on interviews with North American and International buyers of PSI-52, found that:

- PSI-52 is being used domestically and internationally and is increasingly being used in North American mills (versus brokered to international mills). It is possible that the inclusion of polycoat cups in the PSI-52 grade bale may limit end markets to those that can effectively manage their unique processing challenges.
- North American buyers for use in domestic mills indicated that the inclusion of a small quantity of hot beverage cups (less than 10 per cent of the bale) does not appear to negatively impact the PSI-52 grade.

## Conclusion

Polycoat cups are a valuable source of high-quality paper fibre for use as a post-consumer material. The work accomplished to date - by Stewardship Ontario, its study partners, and other organizations- and referenced in this document leads us to conclude that the necessary technologies are available to effectively sort and process polycoat cups. Local governments should ensure that such technologies are in place at their MRFs and end markets before accepting hot beverage polycoat cups in their programs.

## Disclaimer

Stewardship Ontario undertakes market development activities to support printed paper and packaging material recycling, including the publication of research findings. This report contains a summary of research findings to assist recycling program operators in their decision making. The report does not constitute advice or direction. Stewardship Ontario makes no claims with respect to performance or cost. Results may vary by facility and over time due to the lack of uniformity across recycling programs.

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<sup>10</sup> Recyclable Materials Marketing. (2016) *Recycling Hot Beverage Cups*.