



GROUPE D'ACTION PLASTIQUES CIRCULAIRES
CIRCULAR PLASTICS TASKFORCE

LeaPP: From Curbside Collection to Food-Grade Post-Consumer Recycled Polypropylene Packaging

Progress Report

Proposed PCR PP resin specifications suitable for food-contact packaging applications

PRESENTED BY:

Groupe d'action plastiques circulaires / Circular Plastic Taskforce

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ABOUT

The Circular Plastics Taskforce (CPT) is a non-profit organization, established in 2022, seeking to build a circular economy for post-consumer plastic packaging Canada-wide. The CPT was formed through an unprecedented collaboration of organizations across Canada's plastics value chain and is governed by Alberta Beverage Container Recycling Corporation (ABCRC), Cascades, Chemistry Industry Association of Canada (CIAC), Circular Materials, Danone, Éco Entreprises Québec (ÉEQ), Keurig Dr Pepper Canada, ProAmpac and Recycle BC. Together, these organizations establish, fund, and implement projects that identify and trial solutions to barriers preventing true plastics circularity.

ACKNOWLEDGEMENTS

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1.1 The Food-Grade Plastics Challenge

The CPT is interested in establishing pathways that would enable the manufacture of food-grade, post-consumer recycled (PCR) resin from feedstock collected through extended producer responsibility (EPR) systems for packaging and paper products (PPP). The typical pathway for manufacturing a new food-grade PCR resin is (see Figure 1):

- **Designing and marketing** packaging and products that can be recycled with current infrastructure (e.g., eco-design);
- **Collecting** end-of-life materials from end-users (e.g., through an EPR-based curbside collection system);
- **Sorting** the collected materials (e.g., at a materials recovery facility or MRF and/or at a reprocessing facility);
- **Washing and decontaminating** the sorted plastics;
- **Reprocessing** the sorted plastics into new recycled resins that meet industry needs and standards (e.g., plastic pellets or regrind that meet market requirements for purity, pigmentation, and contamination).

To better understand barriers hindering the conversion of plastics into food-grade PCR resin, and to identify opportunities, the CPT undertook a study to document the current state of food-grade PCR resin manufacturing in Canada. In 2023, the CPT published its findings in a report entitled: *Advancing Food-grade Recycled Plastics in Canada: Challenges and Regulatory Perspectives*. A key finding from that work was that the pathway to increase the manufacture of food-grade, PCR polypropylene (PCR PP) requires:

- **Systems and protocols to collect and sort food-grade PP from curbside sources;**
- **Systems and protocols to reprocess and decontaminate the sorted food-grade PP;**
- **Processes to test and confirm the safety of the resultant food-grade PCR PP.**

However, both the systems and processes needed are unclear. Neither Canada nor the United States (US) have set mandatory protocols or approval processes to guide the manufacturing and testing of PCR resins to confirm their suitability for food-contact applications. Instead, Health Canada and the US Food and Drug Administration (FDA) issue "Letters of No Objection" (LONOs) or "No Objection Letters" (NOLs), respectively, to those systems and processes that demonstrate feedstock control and decontamination capability.

Even after obtaining a LONO or NOL, producers bear responsibility for ensuring food safety. This may change in the future. In 2026, Health Canada announced its intention to implement a mandatory pre-market clearance process, similar to that applied in Europe, and establish a formal approval process.

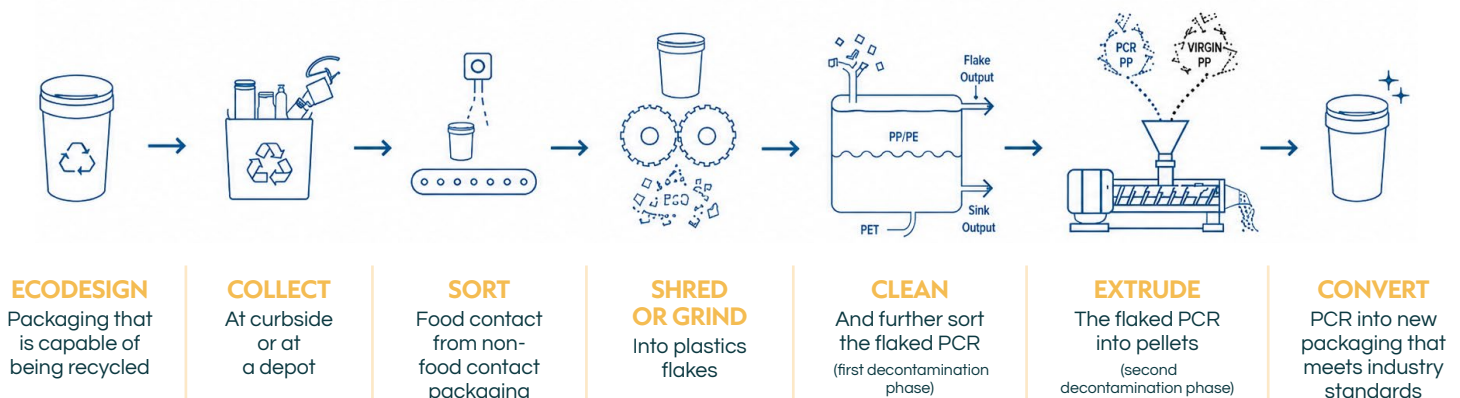


FIGURE 1: PCR PP RESIN MANUFACTURING VALUE CHAIN

1.2 PCR PP Packaging Specifications Targeted

There are two main types of processing systems used to make PP plastic packaging: injection moulding and thermoforming. Both enable high-volume applications.

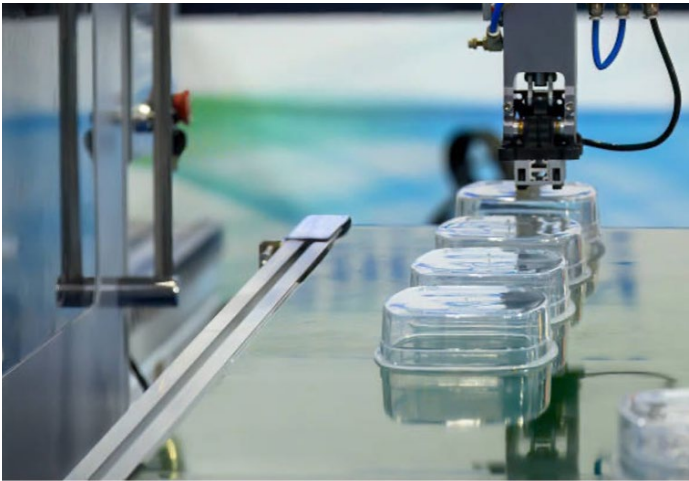


FIGURE 2:
EXAMPLE OF INJECTION MOULDED CONTAINER

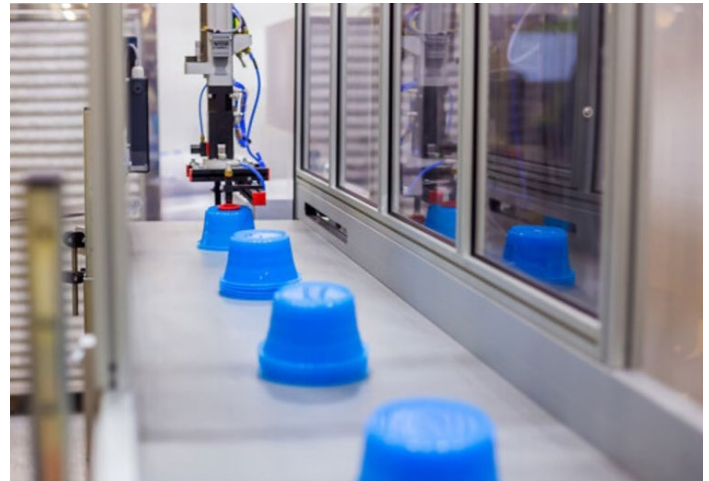


FIGURE 3:
EXAMPLE OF THERMOFORMED CONTAINER



FIGURE 4:
EXAMPLE OF INJECTION MOULDED CONTAINER



FIGURE 5:
EXAMPLE OF THERMOFORMED CONTAINER

Injection moulding is a manufacturing process in which PP pellets are melted and injected into a closed mould cavity under high pressure. The resultant packaging component cools and solidifies inside a mould, creating a rigid and precisely shaped component. Injection moulding enables high dimensional accuracy that is ideal for packaging applications that require strength and intricate details (Figure 2 and Figure 3). This method is widely used for producing complex and durable packaging parts such as caps, closures, and containers.

Thermoforming is a manufacturing process that involves a three-step process:

- A PP sheet is made through an extrusion process;
- The PP sheet is then heated until it becomes pliable;
- The PP sheet is then formed over a mould using vacuum, pressure, or mechanical force. After shaping, the material is cooled and trimmed to produce lightweight packaging items such as trays, cups, and clamshells. Thermoforming is ideal for lightweight, thin-walled packaging (Figure 4 and Figure 5).

Through this project, CPT is taking a step towards closing the food-grade PCR PP circularity gap. Brands recognize PCR resin integration as both a compliance measure and as a critical component of broader voluntary sustainability commitments. The use of PCR resin is widely recognized as a strategic lever for advancing circular economy goals and reducing greenhouse gas emissions. As a result, many brands have set targets for the meaningful inclusion of PCR content in plastic injection moulded and thermoformed packaging formats, including in the food sector despite the challenges associated with sourcing high-quality food-grade PCR resin.

The overarching goal of this project is to establish viable pathways for brands and their converters to incorporate PCR PP resin into high-volume applications (i.e., injection moulding and thermoforming) without compromising product integrity or safety. Since deposit return systems generate limited supply of post-consumer PP, CPT is seeking a pathway to enable the collection and recycling of curbside-generated PP food packaging to manufacture food-grade PCR PP resins.

Globally, several projects are underway seeking similar outcomes:

- In the United Kingdom, Berry Global has developed the CleanStream Process to sort bales of PP from its curbside collection systems and manufacture a food-grade PCR PP resin that has obtained an FDA NOL.
- In France, CITEO (a major French producer responsibility organization for the regulated EPR system for PPP) is funding the “SUPERPE project”, which aims to “validate the purification of rPE and rPP using a supercritical CO₂ treatment to restore the food-grade suitability of the resins”.

As these projects are situated in Europe, they are operating under distinct legal frameworks as well as different contextual factors, such as different types and ratios of packaging formats and compositions, as well as different collection systems. CPT is keeping apprised of this work to understand how the lessons learned in Europe might apply to or differ from a North American solution.

2.1 Objective, Scope, & Approach

Through this project, CPT aims to identify one or more pathways to manufacture PCR PP resin from curbside sources that would be acceptable to both the Canadian and American marketplaces, consider both Canada’s and United States’ polypropylene recycling infrastructure, and enable the use of curbside-sourced food-grade PP packaging as feedstock in the manufacture of food-grade PCR PP packaging. The project is being carried out in two phases:

The tasks by phase and project timeline are outlined in Table 1.

PHASE 1

Which is discussed in this report, sought to develop two PCR PP resin specifications that would be widely acceptable for use in targeted packaging items (e.g., refrigerated tubs, bottles, trays, pouches, coffee pods): i.e., one for food-grade injection moulded packaging and one for food-grade thermoformed packaging.

PHASE 2

Which will begin in the fall of 2026, will test the PCR PP resin packaging reprocessing process, including sorting of curbside-sourced plastic packaging to obtain only food-grade PP resins, washing, decontamination, PCR pellet manufacturing, and testing whether the final PCR PP resins meet brand and regulatory requirements.

² Amcor, 2023. CleanStream® - The Future for Contact-Sensitive Mechanically Recycled Plastic. Available at: <https://packagingsolutions.amcor.com/en/news/articles/cleanstream-the-future-for-contact-sensitive-mechanically-recycled-plastic#:~:text=CleanStream%C2%AE%20uses%20a%20sophisticated,%2C%20achieving%20over%2095%25%20purity>

³ Industrial Technical Center for Plastics and Composites, n.d. Available at: <https://www.ct-ipc.com/projets-de-recherche/superpe/>

TABLE 1: APPROACH, TASKS, AND TIMELINE

Phases	Tasks	Timeline	Status
PHASE 1	Develop suitable PCR PP resins specifications for the highest-volume applications, including one for injection moulding and one for thermoforming.	September 2025 to August 2026	Complete
PHASE 2	Engage one or more partner reclaimers to sort, clean, decontaminate, and finally reprocess curbside-sourced food-grade PP into food-grade PCR PP.	September 2026 to December 2027	In progress
	Test resin incorporation into test products.		
	Measure food safety according to brand requirements		
	Document the process in a manner that supports a Canada and US LNO application		

2.2 Rationale for Targeting Curbside Sources of PCR PP

This project is focused on PP packaging collected from curbside because source-separated PP feedstocks are not readily available in sufficient quantities in Canada / US to enable cost-effective and efficient PCR PP resin manufacturing. Curbside collection of PP packaging, especially through EPR systems, is a major source of untapped PP feedstock to manufacture food-grade PCR PP resins.

However, curbside sources of plastics are notoriously more contaminated, and as a result are more difficult and expensive to process, than source-separated sources (e.g., deposit return systems collecting beverage containers, dedicated reverse logistics systems collecting commercial PP packaging). Source-separated systems tend to have lower levels of organic contamination and generate cleaner bales than MRFs, which manage curbside collected materials.



3.1 Identifying Target Resin Specifications

To oversee Phase 1 research, the CPT established a Steering Committee with members across the PCR PP value chain, including brand owners (Danone, Keurig Dr Pepper Canada, and McDonald's Restaurants of Canada), a polymer manufacturer (Inter Pipeline Ltd.), a converter (Winpak), and a non-profit working on materials circularity (The Recycling Partnership). Reporting to the Steering Committee, the Project Team consisting of subject matter expert Green Group Consulting (GGC), the Chemistry Industry Association of Canada (CIAC), Lichens, and JTL Squared Consulting undertook the Phase 1 research.

The first task of Phase 1 was to understand brand use requirements for PP and PCR PP in food-grade packaging. GGC developed a questionnaire, with the support of the Project Team, and then undertook interviews to gain clarity on the criteria that would need to be met for consumer packaged goods (CPG) brands and their converters to shift from 100% virgin PP packaging to incorporating a minimum of 30% PCR PP resin into their packaging. Through the survey and interviews, the CPG brands and converters were queried about the makeup of their PP packaging, the technical requirements of the resins used to make their packaging, their requirements related to the use of PCR PP, their PCR-use strategies, as well as their respective health, safety, and technical compliance requirements.

Data and information were collected on targets and ranges for melt flow rate (MFR), flexural modulus (Flex Mod), Izod, ash, conditions of use (A-H), and colour. In addition, brands and converters were queried to understand the amount of PP they use annually, and whether they had any additional requirements or use preferences, such as:

- **how critical colour is;**
- **whether brand owners would consider paying a premium for PCR PP;**
- **whether their packaging is mono- or multi-layer, and if multi-layer whether placing PCR resin between layers would be acceptable;**
- **whether an FDA NOL would be acceptable to meet brand specifications;**
- **whether there are other internal or external specifications required.**

SEE APPENDIX B FOR THE FULL QUESTIONNAIRE

GGC signed non-disclosure agreements with each survey and interview participant to ensure confidential information was managed appropriately, as well as provide confidence about adherence to competition laws in Canada and the United States. GGC then compiled and anonymized the data and information collected and used it to design two specifications for packaging formats that had a high crossover of uses amongst the CPGs i.e., one specification for injection moulding and one for thermoforming. These specifications will be used to enable the project's Phase 2 tasks.

3.2 Specification Design Considerations

There are several properties that affect how a PP or PCR PP resin behaves in a packaging application. These are critical to consider when manufacturing PP-based packaging as they affect the packaging's safety in use, performance, and colour, as presented in this page:

Ultimately, it is the combination of these properties in the PCR PP resin that will determine whether a brand or converter would be willing to consider switching from their traditional virgin feedstock to include PCR PP resin feedstock in the design of their packaging.

1. MELT FLOW RATE (MFR)

A measure of viscosity, which is important because it affects the rigidity and processability of the resin. A higher MFR typically enables manufacturing stronger, more durable products through injection moulding, whereas a lower MFR enables more resin processability and is suitable for manufacturing thin-walled packaging items such as trays, cups, and clamshells through thermoforming (Figure 6).

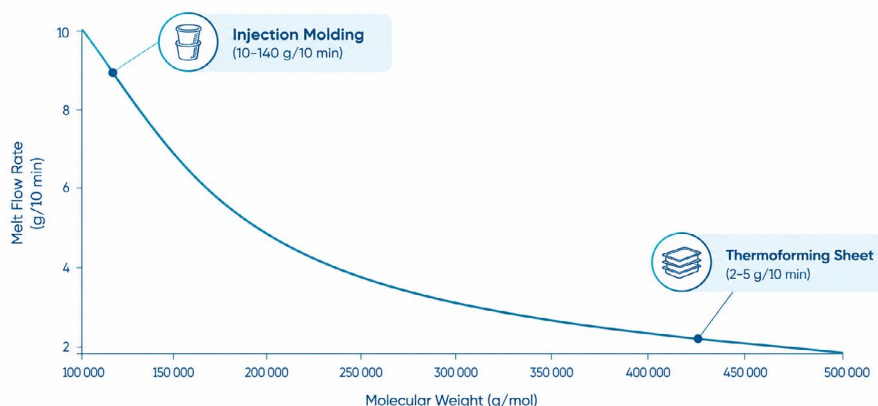


FIGURE 6: MELT FLOW RATE APPROPRIATE TO INJECTION MOULDING AND THERMOFORMING

2. FLEX MODULUS (FLEX MOD)

A measure of material stiffness, which is important because it determines the ability of a material to maintain its shape and structural integrity under applied forces.

3. IZOD

A measure of impact, which is important because it relates to the material's ability to absorb energy from a sudden shock or hit without shattering or cracking (i.e., its toughness).

4. ASH

A measure of the amount of filler and incombustibles in the resin, which is important because it directly affects material strength, dimensional stability, cost, and processing behaviour.

5. CONDITIONS OF USE REQUIREMENT (A-H)

The temperature and time classifications established by Health Canada and the US FDA to determine how materials or packaging can safely interact with food and help to evaluate the likelihood of substances migrating from packaging into food.

6. RESIN COLOUR

Affects final packaging colour, which is intimately tied with brand identity.

3.3 Options for Adjusting the PCR PP to Meet Specifications

The specifications needed to make PCR PP resin suitable for injection moulding and thermoforming processes vary in their needed MFR, Flex Mod, and Izod criteria. Injection moulding requires a higher MFR resin to create rigid structures whereas thermoforming requires a lower MFR resin to create extremely lightweight, thin structures.

There are four ways to change the properties of a PCR PP resin to improve its performance to meet a specification: i.e., change the resin's molecular weight, comonomer content, additives, and/or fillers. These are explained in Table 2.

TABLE 2: PRIMARY WAYS TO CHANGE PCR PP PROPERTIES.

Change	How change affects the resin	How to change it
Change the molecular weight to change its MFR—i.e., the size and length of the molecules in the resin	Impacts the MFR, which in turn affects the packaging's impact resistance and durability. - When the molecules are longer and the polymer has a higher molecular weight, the chains resist flow under heat and pressure, leading to a lower MFR. - When the molecules are shorter and the polymer has a lower molecular weight, the chains flow faster under heat and pressure, leading to a higher MFR.	To increase or decrease the molecular weight of the PCR PP resin, and thus its MFR, increase or decrease the amount of virgin resin of known MFR as feedstock. If additional virgin feedstock cannot be added, hydrogen peroxide may be used to increase the MFR. However, when using peroxide, polyethylene (PE) contamination can cause unintended consequences, so it is typically not the first choice of reclaimers.
Change the comonomer content to affect its Izod	Homopolymer (HOPP) makes plastics stiffer with less impact. Block or impact copolymer (COPP) provides the highest impact resistance and the lowest stiffness. COPP is 6-15% ethylene + 85-94% propylene with an Izod of 1.5 to no break (NB) ft•lb/in². HOPP is 0% ethylene + 100% propylene with an Izod of 0.5 to 0.7 ft•lb/in². Random copolymer (RACO) makes plastics a little more impact resistant than homopolymer but less than copolymer, and enables more flexibility than either the HOPP or COPP. RACO is 2-5% ethylene + 95-98% propylene with an Izod of 0.8 to 1.1 ft•lb/in². RACO can be clarified to reduce haze.	To increase homopolymer attributes, blend in virgin resin. Fillers may be added to increase stiffness. To increase copolymer-like properties, rubbers and modifiers may be blended in.

Change	How change affects the resin	How to change it
Add additives	Additives are substances added to a resin to give it new properties. For example, additives can help to make plastics stronger, cleaner, more resistant to various factors, or even safer. Common additives include: • Antiblock • Antistat • Clarifier • Colour • Flame Retardant • Impact modifiers (TPO, TPE, Rubber, etc.) • Mould Release • Nucleator • Slip • Stabilizer (i.e., heat, oxygen, acid) • UV inhibitor	There are two ways for additives to be included in the final PCR PP resin: 1) the portion of virgin plastics used in the PCR PP resin will have additives already included, and 2) additional additives could be added.
Add fillers	Fillers are materials added to a resin plastic to modify its physical, mechanical, or thermal properties, or reduce processing costs. Examples of common fillers include: • Calcium Carbonate • Talc • Glass	There are two ways for fillers to be included in the final PCR PP resin: 1) the portion of virgin plastics used in the PCR PP resin will have fillers already included, 2) additional fillers could be added.

4.1 Target Resin Specification Types

The CPG brands and converters surveyed use both injection moulded and thermoformed products. As a result, a specification for each type of packaging was developed. The target packaging formats selected are:

- **500-gram injection moulded container**
- **113-gram thermoformed container**

4.2 Specification Needs

CPGs often establish brand specifications for PCR resins that go beyond the minimum regulatory standards set by Health Canada and the US FDA, such as requiring additional migration studies, extraction tests, and audits of feedstock suppliers.

These CPG brand specifications ensure the PCR resins used meet both regulatory compliance and brand functional requirements. The average CPG brand specification needs identified through the Phase 1 research include:

- **Minimum compliance with food safety regulations** – i.e., achieve an FDA NOL and Health Canada LONO.
- **Variable conditions of use for food-contact applications** – i.e., the conditions of use needed must span a wide range, from high-temperature sterilization to refrigerated and frozen storage, requiring PCR resins to perform reliably under diverse conditions. Internal quality protocols and third-party certifications are often mandated to verify PCR resin content and ensure consistent performance.
- **Limited colour flexibility** – while some stakeholders require clarity as clear as virgin resin, most stakeholders expressed a willingness to accommodate variations such as off-white or grey tones, provided colour stability is maintained through proper colour concentrate dosing. While aesthetics remains important for certain product categories, they are not viewed as insurmountable barriers to PCR PP resin adoption.

- **Near virgin price parity** – while there is some willingness to absorb some cost increase, provided it aligns with sustainability objectives and market expectations, the PCR PP resin should aim to achieve price parity with virgin PP resin wherever possible.
- **Quality control and traceability** – suppliers emphasize the need for robust quality control, feedstock traceability, and compliance with chemical management policies. CPG brands commonly audit sourcing and program certifications to ensure process management. Reclaimers are expected to meet stringent standards to ensure food safety and regulatory compliance.

The target resin specifications developed for each type of container are presented in Figure 7.

Target PCR Content Resin for Specific Products

Properties	Units	Test Method	Injection Molded Target	Thermoformed Target
			500 gm Containers	113 gm Containers
Target Product	—	—	500 gm Containers	113 gm Containers
Melt Flow Rate	g/10 min	ASTM D1238	90	3.0
Flexural Modulus (0.05 in/min, 1% Secant, Proc A)	psi	ASTM D790	200,000	290,000
Tensile Strength at Yield (2 in/min)	psi	ASTM D638	3,800	—
Notched Izod Impact Strength (73o F, Method A)	ft-lb/in	ASTM D256	0.8	0.9
Ash	%	ASTM D5630	Unspecified	Unspecified
Additives	—	—	Nuc / AS	Nuc
Color	—	—	Can Go White	Can Go White
FDA Conditions of Use (COU)	—	—	A-H	A-H
More than standard FDA Testing Done	%	—	Yes	Yes
PCR	—	—	30%	30%
Pricing Above Virgin Allowed	—	—	20%	20%

AS = Antistat

Nuc = Nucleation

Conditions of use for FDA

- A** High temperature heat-sterilized over 212-degree F
- B** Boiling water sterilized at 212-degree F
- C** Hot filled or pasteurized above 150-degree F
- D** Hot filled or pasteurized below 150-degree F
- E** Room temperature filled and stored
- F** Refrigerated storage
- G** Frozen storage
- H** Frozen or refrigerated storage: Ready-prepared foods intended to be reheated in container at time of use

5.1 Phase 2 Tasks & Timelines

Planning for Phase 2 will be complete by Q4 2026 and an agreement with project partners will be finalized. Trial testing will commence in Q1 2027 and be complete by Q4. A mid-point status update will be provided to project partners in Q3. The Phase 2 tasks that will be undertaken to develop food-grade PCR PP resins that meet the Phase I specifications for injection moulding and thermoforming are as follows:

- 01 Bales of reclaimed PP packaging will be sourced from a MRF. The bales are likely to be a mixed PP bale (i.e., PP mixed with other plastics such as 1, 2, 3, 4, 6, and 7) containing both food and non-food contact plastics because the technology to further sort the bales is often not cost-effective to install at MRFs.
- 02 The bales will be sent to a reclaimer (also called a reprocessor).
- 03 The reclaimer will undertake a second sorting of the baled plastics to separate the PP packaging from other plastic packaging, as well as separate the food-contact from non-food contact packaging. This sortation is needed for the final PCR PP resin to meet regulatory standards for food-grade plastic resins. The sortation process is likely to include a first sorting by an optical sorter (to separate out the PP packaging from other types of plastic packaging and products), followed by a hand sorting to separate out the food and non-food packaging.
- 04 The reclaimer will then shred the sorted reclaimed food-grade PP into a plastic flake, wash it (completing its first decontamination step), and then undertake a final resin sort using a float tank. The float tank will ensure that only reclaimed PP is in the final PCR PP resin.
- 05 The reclaimer will then dry the flaked, reclaimed PP and sort it again using another optical sorter to sort coloured PP from clear/natural PP.
- 06 The reclaimer will then grind the clear/natural reclaimed PP along with virgin PP and add any additives that may be needed to enable the PCR PP to meet the specifications developed in Phase 1. At this time, the Project Team does not anticipate needing to include any additives.

Note: While the primary focus is to capture the clear/natural and white PP, there may be other non-food-grade markets for the coloured PP. As a result, the Project Team will also seek possible markets to recycle the coloured PP reclaimed at this stage.

- 07 The ground PCR PP resin combined with the appropriate amount of virgin PP resin will then be extruded (completing its second decontamination step) to make the final PCR PP resin pellets. The aim is to hit a minimum 30% PCR target in the final resin.
- 08 The resultant PCR PP resin will be tested for food safety (i.e., ability to meet an FDA NOL) either by the reclaimer using its onsite labs or by a third-party lab.
- 09 As well, CPG brands and converters will be offered a sample to test for whether the PCR PP resin pellets also meet brand specifications.

All the steps will be documented according to the need to submit a request for an FDA NOL.

5.2 Phase 2 Tests

The Phase 2 tests that will be undertaken to ensure the PCR PP meets regulatory requirements and the Phase I specifications are as follows:

- Melt Flow Rate ASTM D1238
- Flexural Modulus ASTM D790
- Tensile Strength ASTM D638
- Notched Izod ASTM D256
- Ash Content ASTM D5630

Chemicals testing will be aligned with both Health Canada and US FDA testing protocols. The chemicals that will be tested for include:

- Benzene
- Bisphenol A
- Total Organic Fluorine
- di(ethylhexyl)phthalate
- dibutyl phthalate
- Heavy Metals
- VOC Screening
- PFAS

5.3 Recycling needs for phase 2

Phase 2 will involve testing the target resin specifications developed for the two selected product applications designed in Phase 1. The Project Team is assessing potential reclaimer partners as well as third-party labs. The partner shortlist is being developed. Interested parties can contact the CPT to discuss potential participation.

Key considerations in selecting a partner for Phase 2 include:

- **The ability to collaborate on development projects with target specs as detailed (quality assurance, lab requirements).**
- **The equipment framework for a mechanical PP recycling line from sortation through pelletization, including washing and optional compounding.**
- **The supplier's capability profile.**
- **The desire for CPT to include representative partners, specifically:**
 - A primary Canadian recycling partner.
 - An American strategic partner.
 - A virgin resin and compounding support supplier.
 - A MRF with PP packaging feedstock sourced from curbside collection.

The partner shortlist was developed and is under internal review.



ABCRC	Alberta Beverage Container Recycling Corporation
ASH CONTENT	Amount of filler and incombustibles
CIAC	Chemistry Industry Association of Canada
COU	Conditions of Use for Food Contact (A-H)
COPP	Block or impact copolymer
CPG	Consumer Packaged Goods
CPT	Circular Plastics Taskforce
ÉEQ	Éco Entreprises Québec
EPR	Extended Producer Responsibility
FAQDD	Fonds D'Action Québécois pour le Développement Durable
FDA	United States Food and Drug Administration (US FDA)
FILLER	Types of filler typically include calcium carbonate, talc, or glass fiber
FLEX MOD	Flexural Modulus: a measure of stiffness
HDPE	High-Density Polyethylene
HOPP	Homopolymer
IZOD	Notched Izod: a measure of impact strength
LONO	Letter of No Objection (Health Canada)
MONOMER OR OTHER STARTING SUBSTANCE	a. A substance subjected to any type of polymerization process to manufacture polymers; b. A natural or synthetic macromolecular substance used in the manufacture of modified macromolecules; c. A substance used to modify existing macromolecules, natural or synthetic.
MFR	Melt Flow Rate: a measure of viscosity
MRF	Materials Recovery Facility
NB	No Break (a designation of IZOD)
NOL	No Objection Letter (US FDA)
PCR	Post-Consumer Recycled
PCR PP	Post-Consumer Recycled content polypropylene
PLASTIC MATERIAL	A polymer to which additives or other substances may have been added, capable of serving as the main structural component of final materials and objects
PE	Polyethylene
PP	Polypropylene
POLYMER	Any macromolecular substance obtained by: a. A polymerization process, such as polyaddition or polycondensation, or any other similar process from monomers and other starting substances; b. Chemical modification of natural or synthetic macromolecules; c. Microbial fermentation.
RACO	Random Copolymer
REPROCESSOR OR RECLAIMER	Reclaimers, also called reprocessors or recyclers, are companies purchasing post-consumer plastic material waste and preparing it for new use by two or more additional processes like:
SPECIFICATION	The composition of a substance, the purity criteria of a substance, the physicochemical characteristics of a substance, indications of the manufacturing process of a substance or additional information concerning the expression of migration limits
TENSILE STRENGTH	Measure of pulling force required for failure
US	United States



Pathway to Food-Contact Questionnaire

Green Group Consulting (GGC) has been hired to partner with the Circular Plastics Taskforce (CPT) on creating a pathway to food-contact from curbside collection feedstock for polypropylene (PP). A key component of this task is to gain a full understanding of PP specifications for brand owners. Your responses to the following questions will be used by GGC and CPT to inform decision-making for a pathway to food-contact. Results will be aggregated and anonymized for publication.

PP Specifications

1. Do you have any PP product lines that have a goal of incorporating PCR (postconsumer recycled) resin?
2. What are your PCR content percentage targets for the product and stated company PCR usage target?
3. What are the incumbent resins currently being used for these applications?
→ **Please provide the resin grade name.**
4. What are the critical characteristics for the material listed above? Please list the acceptable ranges in the table below and attach each individual product line TDS when available.

	Product 1	Product 2	Product 3
MFR target (e.g. 35 dg/min)			
MFR Range (e.g. 32-38 dg/min)			
Fex Modulus Target (e.g. 240K)			
Flex Modulus Range (e.g. 220K-260K)			
Izod Target (e.g. 0.5)			
Izod Range (e.g. 0.4-0.6)			
Color Target (e.g. YI <2)			
Ash Content Target (e.g. <0.5%)			
Conditions of Use Requirement (AH)			
Color Requirement			
Other Specifications? * This could include surface finish, additives, wall thickness requirements, etc.			

5. What volumes of material are needed per year?
6. Is there flexibility in the properties required for PCR compared to prime resin? If so, what are the acceptable ranges?
7. How critical is color?
8. Is a higher price for color-sorted PCR a plausible consideration?
9. Is the packaging in question mono- or multi-layer?
 - a. If multi-layer, is replacing prime resin with PCR between layers an acceptable option?
 - b. If it cannot be between layers, can it be applied on the outside?
10. When food contact is required, is an FDA LNO acceptable?
11. Are there other requirements that need to be met, either from Health Canada or other (NSF, HAACP, etc.)?
12. Are there any internal tests performed in addition to FDA non-objection?
13. Are there any internal metrics or reporting requirements for PCR resins in food applications?
14. Are there any supplier requirements that a recycler must meet to be eligible?
 - a. ISO 9001, Third Party PCR Certification, etc.
15. For PCR content, what are the acceptable ranges for the below characteristics?

	Product 1	Product 2	Product 3
MFR target (e.g. 35 dg/min)			
MFR Range (e.g. 32-38 dg/min)			
Fex Modulus Target (e.g. 240K)			
Flex Modulus Range (e.g. 220K-260K)			
Izod Target (e.g. 0.5)			
Izod Range (e.g. 0.4-0.6)			
Color Target (e.g. YI <2)			
Ash Content Target (e.g. <0.5%)			
Conditions of Use Requirement (AH)			
Color Requirement			
Other Specifications? *			

Pricing

16. How does your company value the usage of PCR? Are there any internal metrics
17. for the \$ value of PCR other than price?
18. Does the procurement team have a directive for PCR content?
19. Does your company allow for PCR materials to be more expensive than virgin ones?
 - If so, what is the maximum pricing delta allowed?

From Curbside Collection to Food-Grade Post-Consumer
Recycled Polypropylene Packaging

