

A Process for Defining Readily Recyclable

As a global producer of a broad range of consumer and industrial packaging, Sonoco takes a material neutral view of advancing packaging recyclability. Regardless of the format, we believe three things must be true for a packaging to be considered recyclable.

1. It must be included in the relevant collection system,
2. It must be effectively and efficiently sorted using existing technology,
3. It must have at least one dependable end market for the final bale of material.

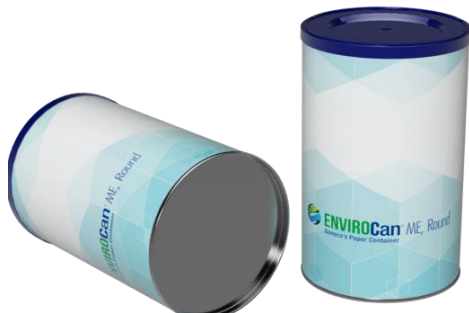
Over the past decade we have seen and implemented advances in both the ability to sort material effectively and efficiently and in the growth of end markets to accept and process collected material. We appreciate that Maine recognizes the list of recyclable packaging is not static and thus created an annual process for review.

We believe that this review process should invite a broad range of stakeholders, including the stewardship organization, material recovery facilities, local municipalities, end markets for material, brand owners and packaging converters. We encourage Maine to acknowledge the recycling lists of other jurisdictions but seek to leverage the funding provided by stewardship program for packaging to create a best-in-class program.

Package Description – Paper Can with Metal Ends

The paper can with metal ends, featured in Picture 2 below, is a package comprised of a multi-layer can body, metal bottom end, top metal closure ring with removable panel, and a plastic lid for reclose. At the time of collection for recycling, both the top closure's removable panel and the plastic lid will have been removed by the consumer for separate recycling so only the can body, metal bottom end and metal top closure ring will remain assembled together as seen in Picture 3 below.

The multi-layer can body is made of paperboard with 100% recycled fiber, an inner barrier liner and a printed outer paper label. That entire multi-layer can body is approximately 90% fiber, and the bottom end and top ring are both 100% steel with greater than 10% post-consumer recycled content.



Picture 2



Picture 3

Information to Support Classification of Paper Can with Metal End as Readily Recyclable

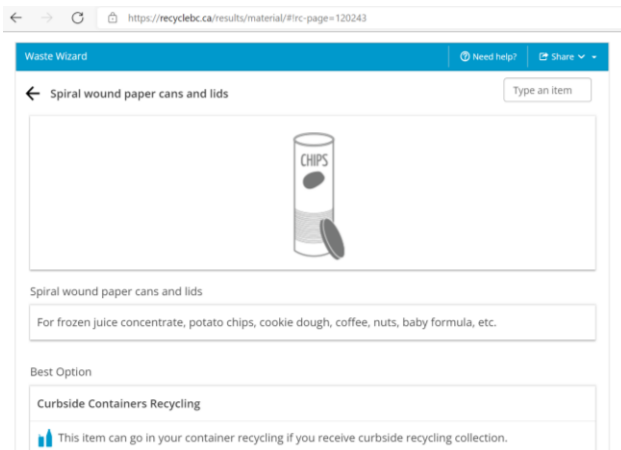
There are two pathways to recycling paper cans with metal ends, either through the steel stream or through the fiber stream. In the steel stream, the steel bottoms and steel top closure rings are recovered and recycled, and the can body is consumed as a source of energy in the steel recycling process. Alternatively, when recycling the paper can through the fiber stream, the fiber is recycled in the pulping process, and the steel components and inner barrier liner are available for further processing and recycling. For the purposes of this submission, we will focus on recyclability through the steel stream as previous sortation trials demonstrate that sortation into the steel can stream is the most effective and efficient means for recovery available today.

Sonoco began increasing the recycling rates of paper cans with metals ends with the launch of their Recyclability Program in 2021. The program uses trial data, technical partnerships, and communication to grow the recycling of paper can with metal ends through the steel and/or paper recycling streams across North America. This program has shown that up to 135,000 tons of paper containers with metal ends could be diverted from landfill nationwide and that recycling the paper container with metal end in the steel stream has a lower climate change impact compared to landfilling and contributes to reductions in greenhouse gas

emissions across the recycling value chain.

The estimated amount of paper cans with metal ends available for recycling in Maine is approximately 561 tons. This estimate is based on Maine's population relative to the US and Sonoco's national distribution of paper cans with metal ends. Paper cans with metal ends are predominately used to package dry products and therefore have little to no residual contamination after usage and no concerns around contamination throughout the sortation or recycling processes.

Paper cans with metal ends can be easily identified with the use of specific graphics or descriptions on municipal material collection sites. For example, the paper can with metal end is a program material for RecycleBC with instructions to be placed in curbside recycling collectionⁱ. (See Picture 4 below.) The paper can is also accepted in Multi-Material Stewardship Manitoba programsⁱⁱ as well as programs in Stewardship Ontario,ⁱⁱⁱ including Toronto. Finally, the paper can with metal end has been included on Oregon's current Uniform Statewide Collection List.



Picture 4

Finally, for ease and simplicity of communication from the stewardship organization or municipality to the residential consumer, sample text and graphics to describe the paper can with metal end can be provided and customized by Sonoco. Below is an example how Sonoco supports the municipalities for increased recyclability and collection with flyers and website content:

A paper canister with steel bottom, also known as a spiral wound container, cardboard can, and paperboard canister, is a multilayer paper canister commonly used to package coffee, dough, snacks, nuts, powdered drinks, and supplements.



Picture 5



Paper Can with Metal End's Ability to be Effectively and Efficiently Sorted with Existing Infrastructure

No significant adjustments to the existing Maine recycling infrastructure are required to recycle the paper can with metal end. The paper can with metal end is collected today in residential curbside programs by being placed in standard bins. The paper cans with metal ends flow to the container line, are collected by the magnet, and then are deposited in the steel can bunker.

Sonoco has commissioned three third-party validated sortation trials and conducted more than a dozen additional sortation trials. The third-party sortation results show that 89% of the paper cans with metal ends are sorted into the container line and from there, they are recovered by the magnet with other steel cans. Specifically, 90% of paper cans with metal ends flowing onto the container line were recovered by magnets compared to 95% of steel cans in the same MRF setup. These paper cans with metal ends are then baled with steel cans and without additional processing recycled at steel mills where the steel is recovered.

Dependable End Markets: Steel Mill Recycling

As highlighted above, the steel can material stream is the most effective and efficient way of sorting paper cans with metal ends available today. The recycling of paper cans with metal ends in steel mills is a decades-long practice that could be leveraged in any mills that currently process steel cans. On a national scale, Sonoco has received letters from over a dozen members of the steel recycling value chain in the US. See Picture 6 showing paper cans with metal ends in steel can bales today.



Picture 6

Sorted bales of steel cans and paper cans with metal ends do not require further processing before entering a smelter or furnace and follow the normal steps of shredding, media separation, melting and reshaping. Recycled steel can be used for the same applications as steel produced from virgin material. Products that are made of recycled steel include electrical appliances, automobiles, office supplies, hardware, construction materials, and containers^{iv} and steel ends for cans.

Sonoco estimates that less than 1% of any steel can bale will contain non-steel components from the paper can with metal end. This estimate is based on a Sonoco-commissioned 3rd party bale audit for the Charlotte-Mecklenburg County, NC area which has accepted paper cans with metal ends in their curbside recycling program for over a decade. The average proportion of paper cans with metal ends in the steel can bales across 3 samplings from 3 bales was 0.92%.

Economic and Environmental Benefits of Recycling

While not recommended for inclusion in the Maine definition of Readily Recyclable, economic and environmental benefits of recycling should be highlighted to motivate consumers. The paper can with metal end supports the existing economics of the recycling system by using a large amount of recycled content with a can body comprised of 100% recycled paperboard and with a metal end composed of greater than 10% post-consumer recycled steel. By ensuring the paper can with metal ends are collected in the recycling stream and not sent to landfill, Maine can help reduce its carbon impact and support material circularity.

Additionally, by adding paper cans with metal ends to the collection program, incremental revenue is available from the increased material flow into the recycling stream. The recovered steel enters a recycling process that is up to 74% more energy-efficient than virgin steel production. The demand for recycled steel far exceeds supply, making it a highly valuable material that is very cost-effective to collect and recycle.^v

Steel components can be recycled indefinitely without losing any of its properties. Recycling 1 ton of steel helps to save 1.8 barrels of oil, 10.9 million BTUs of energy, 642 kWh of energy, and 2.3 m³ of landfill space.^{vi} Additionally, for every ton of steel recycled, 2500 pounds of iron ore, 1400 pounds of coal and 120 pounds of limestone are conserved.^{vii} Making a food can from recycled steel means 75 percent less greenhouse gas emissions and energy use compared to using virgin steel.^{viii}

To provide a quantitative estimate of these benefits, Sonoco utilized PIQET Life Cycle Analysis software and compared recycling a paper can with metal end to landfilling. As seen below, the software platform found a 45% reduction in GHG gases when the paper can with metal end is recycled.

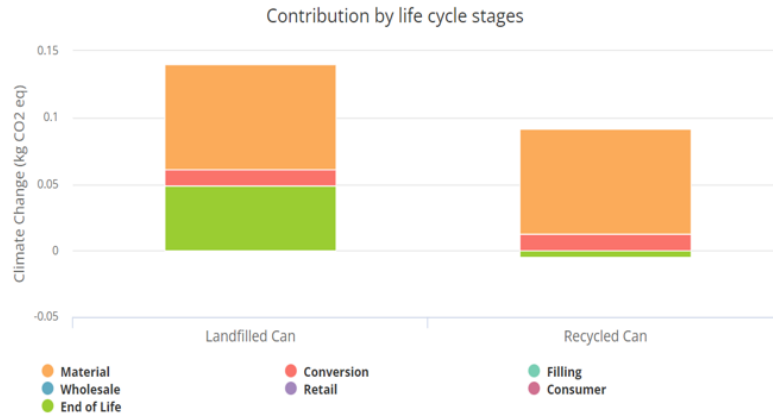


Figure 1

Finally, a Sonoco Europe commissioned a third-party verified comparative analysis run in PIQET that found the paper can with metal end has the lowest GHG emissions when compared to alternative rigid packaging material formats.

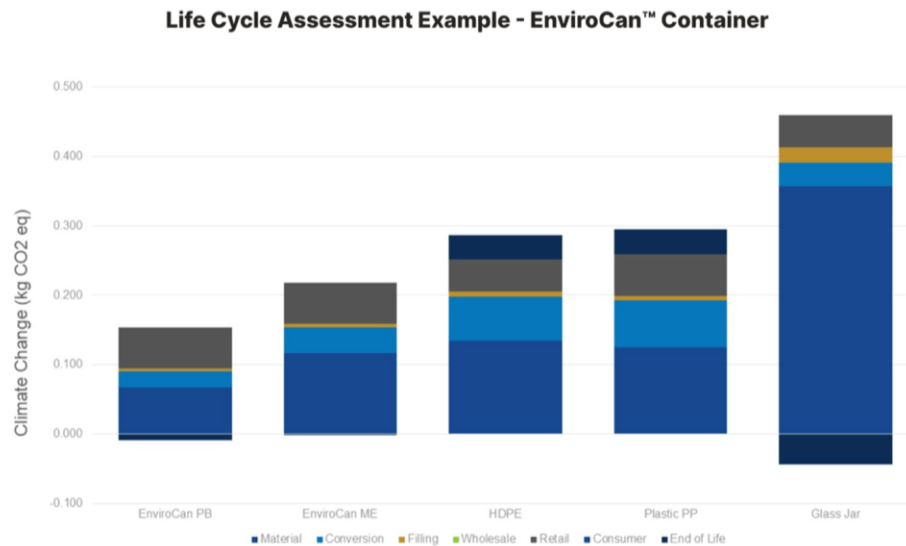


Figure 2: (EnviroCan PB is paper can with paper bottom. EnviroCan ME is paper can with metal end.)

Summary

As a packaging converter, MRF operator and paper mill operator, Sonoco is committed to advancing the recycling of all packaging formats and ensuring that the Maine stewardship program for packaging achieves its stated goals. We believe the definition of Readily Recyclable is a key component of the program and will help drive additional recycling in the state of Maine.

For a package to be considered Readily Recyclable we believe it must be included in the relevant collection system, effectively and efficiently sorted using existing technology and have at least one dependable end market for the final bale of material.

Through studies and firsthand experience, we have found that the paper can with metal end meets these criteria. The existing MRF infrastructure is suitable for recycling the can effectively and efficiently and end markets exist for the material. Sonoco has used and will continue to use its integration with material recovery facilities and steel can manufacturing to support the recyclability of paper cans with metal ends in the steel stream of material.

We look forward to answering any questions you may have around the definition of Readily Recyclable and how the paper can with metal ends fits into the future of Maine's recycling program. Please feel free to reach out to me at scott.byrne@sonoco.com with any questions.

Sincerely,

Scott Byrne
Global Director, Sustainability Services
Sonoco

ⁱ [Material Search » Recycle BC - Making a difference together.](#)

ⁱⁱ [Recyclepedia | Simply Recycle.ca](#)

ⁱⁱⁱ [What Goes in the Blue Bin \(Recycling\)? – City of Toronto](#)

^{iv} [Material Science | News | Materials Engineering | News \(azom.com\)](#)

^v [Is Recycling Worth It? Costs and Benefits of Recycling | RTS](#)

^{vi} [Steel Recycling Principles and Practice \(azom.com\)](#)

^{vii} [How Steel is Recycled \(berecycled.org\)](#)

^{viii} [Home page - worldsteel.org](#)