

The Recycling Process

An inside look at our \$4.5 million modernized materials recovery facility with state-of-the-art separation and sorting methods.



Arriving at the Facility

All materials collected by the Association vehicles are delivered to its Huron Park Material Recovery Facility for processing. They are unsorted, unorganized and of various shapes & sizes.



The Sorting Process Begins

The goal of the sorting process is to completely separate the plastics, glass, paper and metal from each other to produce valuable commodities.



The Pre-sort

When the mixed recyclables are put into the process, they go through an initial manual inspection sort by two to four people. The shredded paper and plastic bags are removed at this point. We also remove any materials that could be harmful on the mechanical processes used to separate the rest of the recyclables.



Plastic Film & Shredded Paper

Plastic film and shredded paper are kept separate until we have enough to bale. Removing them early in the process keeps them more marketable.

The traditional approach to material sorting has been mainly driven by people lined around conveyors manually separating different commodities to meet market demands. This approach was rudimentary and effective when only five materials were collected curbside. Applying this approach to today's material mix is accepting that material quality is not important, high sorting costs are acceptable, and repetitive strain injuries are normal. We do not support this approach to processing.

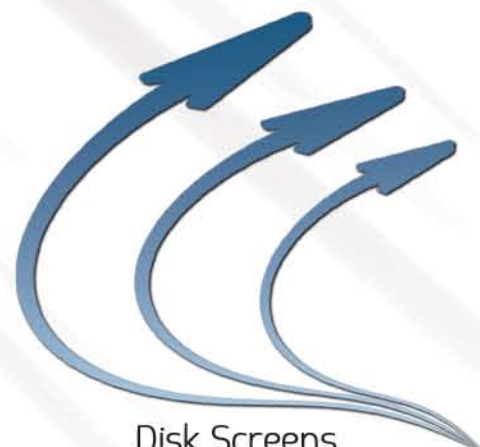
While the Association is proud of its past developments in the Material Recovery Facility, the future of our industry demands higher throughput and a higher quality standard with a broader mix of materials. The ever changing packaging stream makes it a necessity to use technology to assist in the sorting activity, as our people cannot physically and mentally process what is presented to them today in a speed necessary to be effective.

One example is in the early 90's, a PET bottle was essentially a 2L soft drink container. They were easy to identify and quantities were manageable to manually sort after some basic screening. After the Walkerton water incident, single serve PET water bottles proliferated the market place. The impact at the Material Recovery Facility was an increase in bottles managed from 500,000 per year to over 25 million. It is impossible to manually sort this volume and maintain quality without mechanical assistance.

The use of people to manually sort materials resulting in repetitive strain injuries is not sustainable. The average human hand can effectively pick 1,500 pieces an hour. Our optical sorter can do so at up 400,000 pieces per hour. The comparison is not even close. The latest technological advances in our industry have enabled us to effectively change the treatment approach of recyclables where technology does the sorting and our people focus on quality.

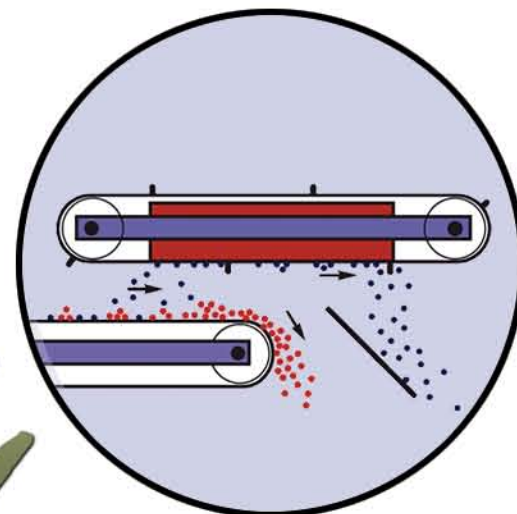
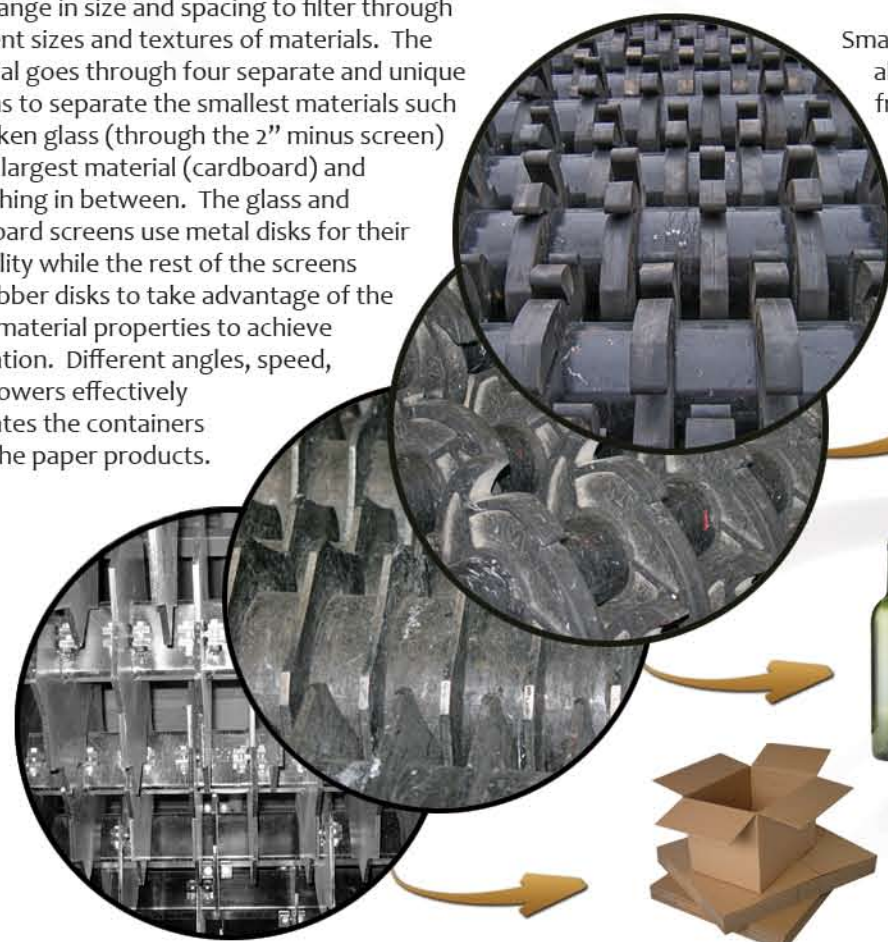
Container Processing

At this junction, the glass and paper have been separated from the containers and put on their own paths. The following equipment is used to identify and separate the remaining containers.



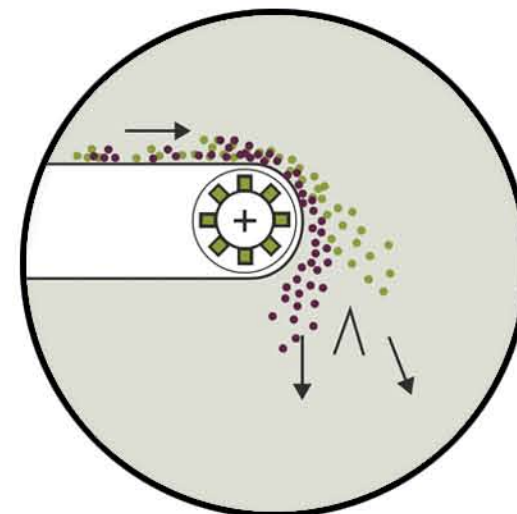
Disk Screens

The disk screens we use at the Association are a very important piece of machinery for separating. They range in size and spacing to filter through different sizes and textures of materials. The material goes through four separate and unique screens to separate the smallest materials such as broken glass (through the 2" minus screen) to the largest material (cardboard) and everything in between. The glass and cardboard screens use metal disks for their durability while the rest of the screens use rubber disks to take advantage of the other material properties to achieve separation. Different angles, speed, and blowers effectively separates the containers from the paper products.



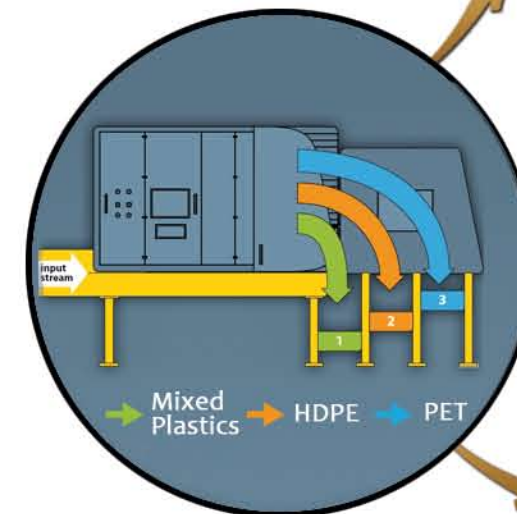
Overhead Magnet

A powerful overhead electro-magnet is used to grab the steel from the sorting process line, and let the plastic and aluminum pass through. All materials are then perforated and flattened to let all trapped contents escape out of the containers that still have caps or lids on them.



Eddy Current

The eddy current uses a number of magnets rotating at high speeds to create a magnetic field that excites non-ferrous material such as aluminum cans essentially 'ejecting' them from the line.



Optical System

The optical system uses a scanner and computer with near infra-red vision to analyze and recognize material types for separation. It is truly a remarkable innovation which identifies 400,000 materials an hour compared to the average human hand that can do 1,500 per hour. See innovation #2.



Mixed Plastics

Mixed plastic containers are identified by the optical sorter and ejected from any other materials left on the belt.



HDPE Plastics

The optical sorter can identify plastic #2 HDPE containers and activate an air jet to eject them from the rest of the containers.



PET Plastics

PET #1 container are also identified and ejected by the optical sorter.

Mixed Paper

Smaller, tighter rubber disks are used to separate all the remaining two dimensional mixed paper from the mostly three dimensional containers.

See Innovation #3 for more information.



Newspaper

The large rubber disks set on a steep angle carry the newspapers to the top while the rest of the materials tumble to the bottom or fall through the screen.

Fines (Glass)

The small metal discs separate the broken glass and other small materials less than 2" in size before heading to the glass cleanup system described in Innovation #1 (to your right)

Cardboard

The cardboard is recovered with our largest screen which lets all materials through except cardboard, the largest material we handle.

Steel

Steel food and beverage cans are attracted to the power of the overhead electromagnet and are automatically separated from the rest of the containers.



Aluminum and Foil

Aluminum cans are non-ferrous but they are excited by the magnetic field generated by the eddy current so they jump off the belt.



Innovations Integral to our Success.

We have researched and experimented with numerous technologies and processes to come up with a combined package that maximizes throughput, flexibility, and quality while minimizing labour and capital costs. Some of the unique components of our system include:

1. A glass cleaning system that removes the glass early in the system and treats the glass with an overhead magnet, an eddy current and uses a cyclone based vacuum system applied to selective particle sizes generated by a trommel for maximum efficiency and clean glass. All metal and paper is removed with this cleaning process creating marketable commodities.
2. The container sort area uses the widest optical system in North America measuring over nine feet across and is the first triple pass optical system in Ontario on one machine. Three separate passes are used to separate the material stream into up to seven categories. The three passes offer greater flexibility of material selection for sorting as the mix changes but the best part is the third pass. After achieving a 90%+ purity level on the first and second pass, the PET and HDPE are batched processed on the third pass to achieve a 98%+ material purity right out of the machine. Our QC sorter can concentrate on non-bottle contamination until such time as end markets can accept them.
3. Another innovative design in this single stream facility is the mixed fibre process. An optical separator is used to remove non fibre contamination (plastic, metal) from the mixed fibre. Any paper removed with the containers is easily recovered with a strategically placed low pressure air classifier effectively separating the paper from the containers. All plastics and metals removed are redirected to the "container" line after being ejected.