Formation 2013

Eco II Mfg Inc.

The oxo-biodegradable bags…

Eco II Manufacturing Inc.
3391 McNicoll Ave
Scarborough, Ontario
M1V 2V4
Tel : 416-292-0220
Fax : 416-292-5435
www.eco2mfg.com

Among us, many heard about the city of Huntington or Amqui, who took the initiative to prohibit the use on non biodegradables plastic bag on their territory. Following this type of actions, we are forced to develop new and effective's solutions in the garbage waste management to protect the environment.

Problematic

Since the 70, the plastic bag is part of our every day life. Every year, Quebecers use billions of plastic bag for their every day purchase and for their garbage disposal. According to Recycle-Québec, between 1,4 and 2,7 billions bags are circulating on the Quebec territory. This means that every Quebecer is using 350 bags per year.

Those bags are very useful, but can create a big source of visual pollution. A lot of them end up in nature due to negligence or simply because there are carried by wind. After they denatured the landscape or scenery by getting cut in trees and they end up in our sewers and finally they overtake our watercourses. They have very negative effects on wild life and since they need more than 400 years to disintegrate, the number of bags in nature increases every year. It is urgent and important to control the life expectancy of those plastic bags.

Different plastics…

- Polyethylene | bags, bottles
    - Low density (LDPE) | +flexibility
    - High density (HDPE) | +resistance +$$$
- Polystyrene | insulation, wrapping
- Polypropylene | thermoplastic

Different types of garbage bags…

Traditional garbage bags (400 years!)

- Made of pure plastic
- Made of recycled plastic

Oxo-biodegradables garbage bags (as ASTM D6954-04)

- Made of pure plastic with additives
- Made of recycled plastic with additives

Hydro-biodegradable or compostable

- Made of a composed plastic/corn starch

  Note: If we use those bags, we will have to dedicate more of our precious farmlands to produce more corn to manufacture those bags. In addition to the pressure we have to produce Ethanol and furthermore feed peoples that are starving.

- Made of a composed plastic/other

Those products are under strict control

Oxo-biodegradables garbage bags: ASTM D6954-04 standard

- Tier I : Degradable within 2 years
- Tier II : Assimilated by micro-organisms (C -> CO_2)
- Tier III : No toxic residue for the wildlife

Hydro-biodegradable or compostable garbage bags: BNQ9011-911/2007 standard

- Phase I : Elements of Chromium VI and volatile solids
- Phase II : Disintegrations in a compost situation (90%+, 58 degrees, -84 days)
- Phase III :
    - Biodegradation (60% of C -> CO_2, max of 180 days)
    - No phyto-toxicity of the compost versus a regular compost
    - 90% increasing of the biomass (2) (cress, radish, oat, barley, rice)

The certification program BNQ9011-911/2007 is very difficult to reach even if the product is considered compostable. As an example; the leaves of a tree, the cardboard and banana skin cannot disintegrate as required. But they still considered as compostable.

As far as the compostable bag actually marketed, only one has been tested for this situation. In Canada they are all sold under the certification BPI (Biodegradable Products Institute) in the USA, we accept the ASTM D6400-04 standard. This certification program is much less restrictive than the Québec Normalisation Bureau.

ECO II BIO 100% oxo-biodegradable…
What is it?

Oxo-biodegradable plastic are conventional plastic to witch we add special products to accelerate the breaking down of the plastic chemical structure. The leftover from this decomposition can be transformed in…

- Carbon gaz C -> CO2
- water
- nutritive elements

… this way goes back to the ecosystem.

Is this a new phenomenon?

No, degradation is well known and has been the subject of many researches for many years. It is made out of the reaction of plastic with oxygen that merge to create smaller molecules that are use to feed micro-organisms. This was impossible with the original plastic. Without additives, the conventional plastic the degradation is very slow. Adding oxo-biodegradable accelerate or catalysis this reaction.

This technology could risk that the bag deteriorates during its utilisation?

No, the additive do not start the process, it only accelerate when started. Many causes will affect that…

- heat
- the sun (UV)
- oxygen
- the mechanic stress
- etc.

… are necessary to activate the degradation. Furthermore we add antioxidant that prevent the plastic from modifying while the transformation to finish products. These antioxidants dissipated slowly and as long as they are present, the additives have no effect at all. Our products are design to have a lifespan of a few years on the shelves before their final use. They start transforming when they are thrown away in the (landfill, garbage or compost) witch are

- hot
- sunny
- mechanically stressed
- and that contain oxygen

Why is it so important?

Our technology allow the bag to keep its total resistance and then to accelerate its return to the ecosystem when thrown away.

What are the advantages?

For the landfill…

We are trying to narrow the biologic effect in the landfill, it can't be stopped. We can evaluate this via the recuperation of methane gas, one of the gases responsible for the greenhouse effect that is generated by the decomposition en milieu sans oxygen (anaerobic). This is created by discarding waste in conventional garbage bags that will degrade after many years and deep in the soil. $C \rightarrow CH_4$

But the oxo-biodegradable bag will degrade within a few months and will allow organic content to disintegrate close to the surface of the soil where there is more oxygen available. This will reduce the speed to witch the filling of the landfill will be completed and will form carbon dioxide gas , 24 time more friendly to the environment than methane. This carbon dioxide will be recuperated by the plats thanks to the photosynthesis. $C \rightarrow CO_2$

For the cities and municipalities…

The oxo-biodegradables will not solve the garbage problem, mainly because it is a human problem a behaviour problem. But they will disappear after a few months and reduce the accumulation, and the visual pollution.

For the collection of recycling…

A recent study by the C.R.I.Q. to evaluate the impact of biodegradable bags on recycling versus the standard plastic bag came to the conclusion that *« The oxo-biodegradables bags had an excellent compatibility with the traditional bags with the preparation of the mixing, and with the extrusion of the profiles and of the pellicles… they then can be considered compatible with the recycling chain of the traditional plastic bags »*.

The oxo-biodegradable bags are the recyclable and totally compatible with the actual path of plastic recycling.

For the collext or organic waste …

A recent study by the C.R.I.Q. has shown that the organic waste composted in oxo-biodegradables bags do produce a compost of equal quality that the one produce without their use. Many studies including the one by C.R.I.Q. have shown that the compost created with the use of oxo-biodegradables bags was not toxic. We can then say that they are safe for the environment and are a plus for the soil.

Eco II is now in process of acquiring the BNQ9011-911/2007 certification for the compostable bags. Phase I is now completed with success, and we should have result for phase II in January 2009.

This will allow us to offer the first bag made of recycled resin, oxo-biodegradable within 2 years and recognise for the compostable sites. This will be a first because no other products meet the standard of the Bureau de Normalisation du Québec.

Comparing prices…

The oxo-biodegradables bags are actually sold at competitive prices with the traditional bags. In certain cases, they will be less expensive than the traditional bags sold by known national brands.

Example…

- Traditional bags
- Oxo-biodegradable bags
- Hydro-biodegradable/compostable bags

Products available at ECO II…

Traditional bags

- Industrial
- Retail
- Construction

Sacs oxo-biodegradables

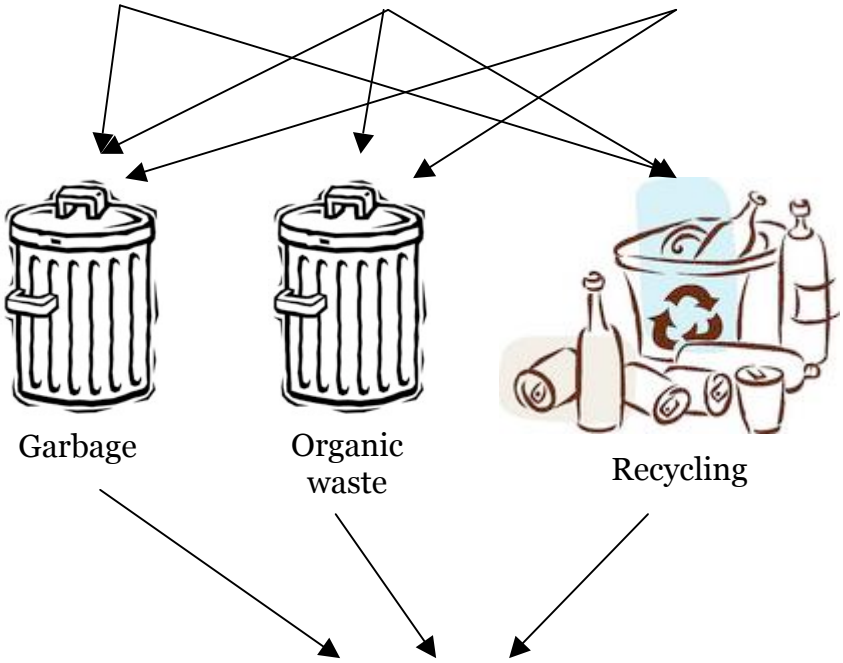
- Eco II Bio industrial
- Eco II Bio retail

Sacs Compostable

- Industrial
- Retail

ECO II BIO 100% oxo-biodegradable
Summary…

Regular Bag | Oxo-bio Bag | Hydro-bio Bag



Only the Oxo-biodegradable ECO II BIO bag make it possible to route all type of garbage in their respective processing plan!

Certifications

Our certifications…

June 2008
ASTM D6954-04

Standard Guide for Exposing and testing Plastics that Degrade in the environment by a Combination of oxidation and biodegradation

December 2008
EcoLogo Program – CCD-126

100% recycled material product that must contain a minimum of 20% post-consumer material of which at least 50% must be household post-consumer material

December 2009

Compatible with the dynamics involved in the composting process and not detract from the physical and chemical quality of the end product, compost.