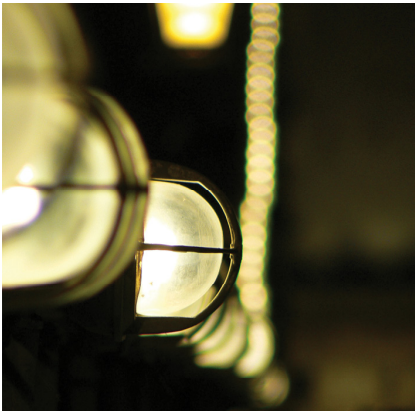


# Smart Purchases Big Impact

**Sustainable Purchasing Guide**  
**Plastic Film**

*Sustainability... your university, your world*

A stylized black silhouette of a tree with many leaves.



## Introduction

This section provides information on currently available **plastic film products** that can help to move the University of Saskatchewan toward its sustainability goals. Living within the boundaries of our sustainability goals requires us to apply two main strategies:

- Dematerialization** requires that we reduce the amount of materials as much as possible; and that we continually move toward the use of 100% recycled content.
- Substitution** requires that we find less harmful materials to replace those that currently damage and are not recyclable.

**Sustainable purchasing** is about including social, environmental, financial and performance factors in a systematic way. It involves thinking about the reasons for using the product (the service) and assessing how these services could be best met. If a product is needed, sustainable purchasing involves considering how products are made, what they are made of, where they come from and how they will be used and disposed.

Finally, remember that this is an evolving document – it will change with new information as our understanding of sustainability impacts and potential solutions improves.

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**Smart Purchases  
Big Impact**

Wherever possible **CHOOSE** products that employ a combination of characteristics listed in the left hand column, and **AVOID** products that demonstrate characteristic in the right-hand column.

CHOOSE	AVOID
<ul style="list-style-type: none"> <li>Eco-Logo Certified products</li> <li>Reduce the use of plastic film</li> <li>Bio-plastic products</li> <li>Paper products</li> </ul>	<ul style="list-style-type: none"> <li>Conventional plastic film products</li> </ul>

### Option: Reduce Use of Plastic Film

**Strategy: Dematerialization – Less waste and Resource Efficiency (SO 1, 3)**

Reducing the amount of plastic film we use mitigates all related sustainability impacts. We should identify reusable products that can work as viable alternatives to plastic film. In some cases, paper wrap and bags may be an alternative to plastic film products. Paper bags will decompose much more easily than their plastic counterparts. Be careful though, many paper bags are in fact coated with plastic. Paper bags have their own set of sustainability considerations. Pay attention to how the paper is produced and the how the forest resources are managed. More information can be found in the guide on *Paper Products*.

### Option: Use Eco-Logo Certified Products

**Strategy: Dematerialization and Substitution (SO 1, 2, 3, 4)**

Environmental Choice certified plastic film (garbage bags, grocery carry-out sacks, retail sacks, industrial shipping sacks, shrink film case wrap, industrial stretch wrap, drum and other liners, construction films, agricultural films, and agricultural mulch films) are assessed on the basis of recycled content, ability to be recycled and chemical use.

### Option: Use Bio-Plastics

**Strategy: Substitution – Nature-like (SO 1, 2, 3, 4)**

Bioplastics are derived from natural renewable resources which can be grown, rather than extracted from the earth. For example, Mater-Bi, one of these bioplastics, is mainly derived from corn, wheat and potato starch. Mater-Bi’s physical and chemical properties are similar to those of traditional plastics, but it is completely biodegradable within a composting cycle.

Bioplastics reduce the need to extract resources from the earth, decrease the combustion of fossil fuels and the processing of petrochemicals, and diminishes all of the associated human health and environmental impacts.

## Option: Use High Post-Consumer or Post-Industrial Recycled Content

Strategy: Dematerialization and Substitution (SO 1, 2, 3, 4)

Plastic film is made from combining and melting pellets of recycled plastic and/or virgin plastic into a roll of film. The percentage of recycled content can range from 0 to 100%. The availability of bags with recycled content is dependent on the type of product. Environmental Choice certification for plastic films requires a minimum of 10% post-consumer recycled content.

Recycled plastics reduce the amount of non-renewable petroleum or natural gas used as feedstock for plastics and also require less energy during the manufacture of the bags. Both of these effects reduce the amount of fossil fuels used, thus reducing the substances from the earth's crust that build up in nature, the chemical compounds created by the combustion of fossil fuels, and the degradation of nature and human health impacts associated with the combustion of fossil fuels. Finally, they also reduce the flow of plastic films to landfills.

# Arriving at the currently preferred options

## 1. Identify the service

Plastic film is used in a wide range of applications, from food services to retail to construction to agriculture where light weight, flexible, air tight containment is desired.

## 2. Assess the need

In some applications, such as food services, it is necessary to seal products in a barrier that protects from air, moisture and bacteria.

## 3. Identify the contents

Most plastic film is made of low-density **polyethylene** (LDPE), which is the most widely used plastic in the world. High-density polyethylene (HDPE) is second. LDPE is soft, stretchy, water and air proof.

The feedstock for polyethylene is derived from **petroleum and natural gas**. The physical and chemical properties of the feedstock determine the performance potential of the plastic film. A process called extrusion converts the hard polyethylene beads or pellets into plastic film. Once melted (200oC), the molten polyethylene is put under high pressure and mixed with agents that provide color and make the plastic pliable.

## 4. Identify sustainability impacts

*i....systematically increasing concentrations of substances from the earth's crust?*

- **Fossil fuels** are combusted to provide energy during the extraction of raw materials, transportation, and production of plastic film. The combustion of fossil fuels leads to an increase in concentration of substances extracted from the earth's crust in nature (CO<sub>2</sub>, CO and SO<sub>x</sub>). Increasing con-

centrations of these substances in nature can contribute to a number of negative effects such as climate change and acid rain, as well as to negative human health impacts.

- **Petroleum** is also used as a feedstock for most polyethylene, a material that is extracted at a rate much greater than its redeposit back into the earth's crust.
- Some of the inks used to colour plastic film products contain **heavy metals**. These are released into nature when a plastic bag is incinerated.

*ii....systematically increasing concentrations of substances produced by society?*

- If plastic film is not recycled upon disposal, it either becomes litter or ends up in landfills or incinerators. **Polyethylene** persists in the environment long after it is used and discarded, contributing to an increase in concentration of synthetic substances in nature. While it is true that over time and under the right conditions plastics will oxidize, fragment and disintegrate, with continued strong growth in the use and disposal of plastics, the timeline is too long to prevent their accumulation in nature. The additives in plastic film can also release dioxins when they are incinerated.
- The combustion of fossil fuels produces a number of **chemical compounds** (e.g. nitrogen oxides) that build up in the atmosphere.
- The process of refining fossil fuels into petrochemicals requires a number of **persistent chemicals** that are used as corrosion inhibitors, neutralizers, surfactants, defoamers, and more.

*continued on page 3...*

#### 4. Identify sustainability impacts (con't)

iii...systematically degrading nature by physical means?

- Plastic film products that go to landfills contribute to the physical degradation of nature through increasing amounts of land used for landfill. Plastic film has also been associated with wildlife mortality in cases where the plastic has been mistaken for food.
- The extraction of fossil fuels (as feedstock for plastic bags and for energy) also contributes to the physical degradation of nature.

iv. . . .systematically undermining people's ability to meet their basic human needs?

- A number of the compounds produced by the combustion of fossil fuels and other processes to create plastic bags (e.g. nitrogen oxides, carbon monoxide, sulfur oxides, particulate matter) negatively affect **human health**.
- A number of the issues associated with the disposal of plastic film have **human health and safety impacts**.

#### 5. Envision sustainable plastic film

Sustainability requires that materials be kept within natural cycles (where materials can be easily assimilated by nature) or tight technical cycles (where materials can be reused indefinitely in processes that do not move us away from our sustainability objectives). A sustainable film would not contribute to systematic increases of substances extracted from the earth's crust, or of human-made substances. This means that it would either (1) not contain any substances that could systematically increase in nature or (2) that these substances would be taken back and re-used entirely.

Sustainable plastic film would either be produced from bio-based materials that natural ecosystems can easily assimilate, or be 100% recycled. The energy used for extracting raw materials, producing and transporting the bags would be generated from sustainable renewable sources in a carbon-neutral way, so that no carbon was allowed to systematically increase in the atmosphere and biosphere.

#### 6. Identify and prioritize alternatives

Identify the plastic film product that offers the best pathway toward meeting all four of our Sustainability Objectives by using the following three criteria for assessment:

- a) Does the product or service move us in the right direction with regards to our four Sustainability Objectives?
- b) Does the product or service create a flexible platform for the next step toward sustainability?
- c) Is the decision financially viable?

### Resources and Additional Information

1. Mater-Bi Biodegradable plastic  
<http://www.novamont.com/default.asp?id=504>



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