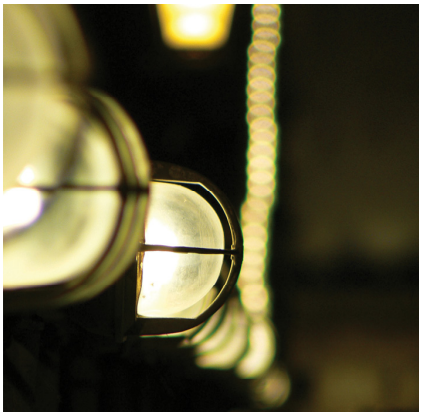
University of Saskatchewan

Smart Purchases Big Impact

Sustainable Purchasing Guide

Void Fillers

Sustainability... your university, your world



University of Saskatchewan

Void Fillers

Introduction

This section provides information on currently available ***void fillers*** 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.

Purchasing Services

Tel: (306) 966-6704
Email: purchasing.services@usask.ca

Office of Sustainability

Tel: (306) 966-1236
Email: fmd.sustainability@usask.ca

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
• Reusable packaging • Recycled content • Recyclable content • Paper-based products • Biodegradable and biocompatible content	• Expanded polystyrene

Option: Reuse Polystyrene Packaging

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

Expanded Polystyrene, more commonly known as "Styrofoam," is widely used for product packaging. Packing "peanuts", formed from Styrofoam, are the most widely used product protection materials due to their low cost.

When disposed of in landfills, expanded polystyrene does not degrade. Reusing these packing materials diverts them from the landfill and reduces the need to manufacture new ones. Most UPS stores, mail centers or post offices will accept returned packing peanuts to be reused.

Option: Recyclable and Recycled Packaging

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

Polystyrene blocks are a #6 plastic material which are often used to protect electronics. Polystyrene is not easily recycled because of its light weight and its low scrap value, especially in its expanded form.

Ideally, choose a company that has a take-back program for their plastics to be reused (closed-loop). Another option is to find local companies that are able to recycle plastics.

To ensure that you are choosing packaging products that will be accepted by recycling facilities:

- Avoid composite packaging that incorporates a number of different materials.
- Choose packaging that has been designed for the separation of individual parts for recycling if composite packaging is necessary.
- Choose products that are free of materials that will interfere with the recycling process, e.g. labels, inks, colouring, adhesives, seals, handles, inserts, liners, laminates and closures.
- Look for companies that have a take-back program for their plastics to be reused (closed-loop).
- Avoid coatings or films (such as a polyester film), where possible.

Recycled plastics reduce the amount of non-renewable petroleum or natural gas used as feedstock for void fillers. This reduces the fossil fuels used, thus reducing the substances from the earth's crust that build up in nature and the chemical compounds created by the combustion of fossil fuels.

Option: Paper Packing Materials

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

Moulded paperboard serves the same protective function of polystyrene blocks, yet it is widely accepted as recyclable and can be made from recycled fibres. Moulded paper can be tightly fitted around a particular product. Packaging in this way not only reduces waste by eliminating the need for interior void-fillers but it also provides a shell that is easy to stack and can take up less space to store and transport. One common example of this type of packaging is the egg carton.

Multi-layer paper systems bond together two or three plies of paper which are slightly crumpled to create variable or predetermined lengths of cushioning/void fill material.

Dunnage paper peanuts are off-cut or spare pieces of scrap wood. These can be tightly twisted into individual pellets which are used as substitute void fillers in the shipment of fragile packaged goods.

Paper products can be made from 100% recycled materials. They are both biodegradable and inexpensive. Paper can be unbleached, emitting few pollutants. Recycling facilities for paper products are common and easily accessible.

Option: Packaging with biodegradable or biocompatible materials

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

Several biocompatible protective packaging peanuts are available on the market. These void fillers and product protectors are very similar both visually and functionally to polystyrene peanuts, but are derived from a renewable source. These products are generally made from an organic starchy material, such as corn or potato, which breaks down into small particles that are inert or even beneficial to the environment. These biocompatible products result in less waste entering the environment.

Option: High post-consumer or post-industrial recycled inflatable plastic bags

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

Recycled plastics usually result from combining and melting pellets of recycled plastic and virgin plastic into a roll of film. In some cases, it may also contain biodegradable plastic. Recycled plastic reduces the amount of non-renewable petroleum or natural gas needed as feedstock. This reduces the amount of fossil fuels used, thus reducing the substances from the earth's crust that build up in nature and the chemical compounds created by the combustion of fossil fuels.

Arriving
at the currently preferred options

1. Identify the service

Void fillers are used to reduce the chance of damage in the shipment of goods.

2. Assess the need

The University of Saskatchewan does not produce most of the products it requires on campus and therefore requires the shipment of goods to campus. These must be packaged in manner that reduces the opportunity for damage.

3. Identify the contents

Currently, most packaging void fillers are made of expanded polystyrene (Styrofoam) which contains the following components:

- ***Benzene*** is a petrochemical extracted from coal, and also found in gasoline.
- ***Styrene*** is "cracked" or extracted from petroleum.
- ***Blowing agents*** – chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs).

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 plastics. The combustion of fossil fuels leads to an increase in concentration of substances extracted from the earth's crust in nature (CO_2, CO and SOx). Increasing concentrations 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.
- Benzene is extracted from ***coal***.

continued on page 3...

4. Identify sustainability impacts (con't)

- ***Petroleum*** is also used as a feedstock for most polystyrene and is a material that is extracted at a rate much greater than its redeposit back into the earth's crust.

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

- Petroleum is also used as a feedstock for most polystyrene. The combustion of fossil fuels produces a number of ***chemical compounds*** (e.g. nitrogen oxides) that build up in the atmosphere.
- Volatile organic compounds (***VOCs***) are used in polystyrene production as adhesives. VOCs do not break down easily and accumulate in nature, contributing to a variety of problems such as the formation of smog.
- Plastic polystyrene does not breakdown, cluttering the Earth's surface and threatening wildlife, particularly marine life who often mistake floating plastic with food.
- Up until the late 1970's, Chlorofluorocarbons (CFCs) were used as the blowing agents for Styrofoam production. CFCs were replaced with HCFCs combined with Ethylene. ***HCFC***, though less destructive than its chemical cousins, CFC-11 and CFC-12, is still a greenhouse gas and harmful to the ozone layer.

iii. ...systematically degrading nature by physical means?

- Expanded polystyrene is not recyclable and is currently over-burdening landfills, displacing humans and the natural habitats.

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

- Benzene, a component of expanded polystyrene, is considered a mutagen and a carcinogen.
- Polystyrene is lipid soluble, meaning it is stored in the body's fat stores and not passed through the body like water-soluble compounds. Polystyrene contains Styrene and Benzene. There are concerns about these chemicals leaching into food and beverages from containers.
- A number of the compounds produced by the combustion of fossil fuels and other processes (e.g. nitrogen oxides, carbon monoxide, sulphur oxides, particulate matter) negatively effect human health.

5. Envision sustainable void fillers

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). Sustainable packaging materials would not contribute to systematic increases of substances extracted from the earth's crust, or of human-made substances.

This means that they 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. Packing products 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 containers 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 void filler product option 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. U.S. Environmental Protection Agency: Styrene
www.epa.gov/ttn/atw/hlthef/styrene.html
2. U.S. Environmental Protection Agency: Benzene
www.epa.gov/airtoxics/hlthef/benzene.html

WHISTLER

This guide was made possible through the generosity of the Whistler 2012 project, which shared its template and much of its research.