Zotefoams plc

Technical Information Sheet – TIS 04
(previously BTI9)

Azote Foams : An Environmental Perspective

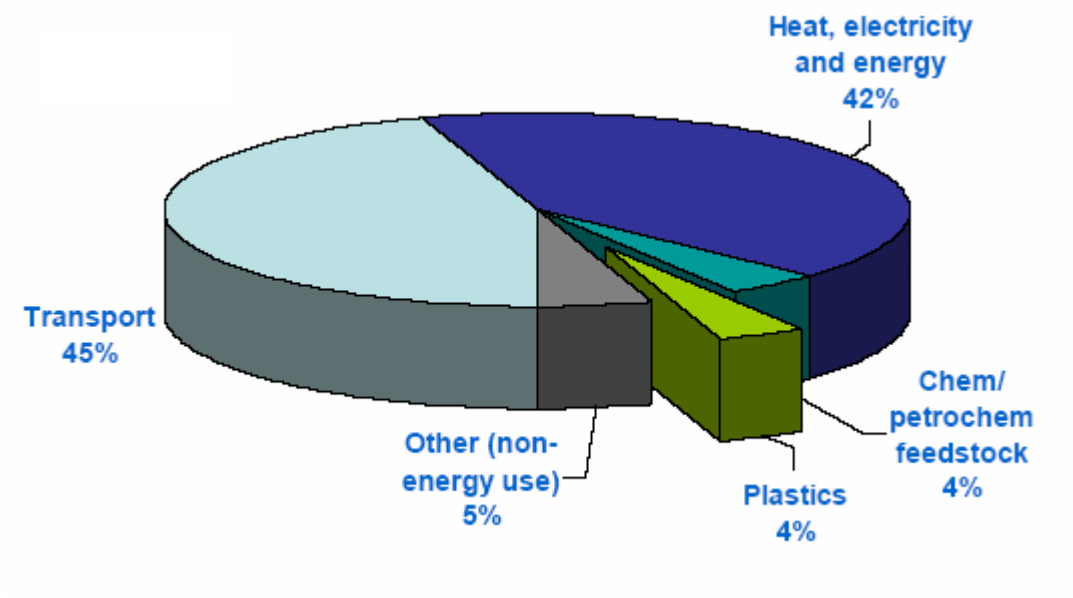
INTRODUCTION

In today's world there is ever increasing concern for our environment and how it is affected. Many people have mixed feelings about plastics such as polyethylene and the part that these materials play in our daily lives.

This technical information sheet aims to briefly set out some of the facts by which polyethylene (and hence Plastazote® foam, Evazote® foam and Supazote® foam) can be judged alongside other materials and their relative effects on the environment.

USE OF OIL RESOURCES

By far the major use of oil is in transport. To economise on our usage of oil, economies in transport (such as the imposition of modest speed limits) would have a much more significant environmental impact than any reductions in the production and use of polyethylene or other plastics. Comparative West European figures for total oil utilisation are :



Source: IEA[1]

Polyethylene materials are responsible for consuming less than 2% of the total usage of oil.

ENERGY[2]

Plastics are efficient in their use of energy during manufacture of products from the basic polymer. For example, the same amount of energy would yield fifty 1-litre polyethylene bottles but only twenty-two 1-litre glass bottles.

The lightweight character of plastics also offers energy savings during delivery. For instance a 39% fuel saving can be made when delivering mineral water in plastic as opposed to glass bottles. This also has a knock-on effect of reductions in air pollution from the delivery fleet.

AIR POLLUTION[2]

During manufacture, polyethylene produces low levels of air pollution compared with, for example, paper-making. Taking a baseline of 100 units, comparative figures are :

	Nitrous Oxides	Sulphur Dioxide	Carbon Monoxide	Dust
Polyethylene	100 units	100 units	100 units	100 units
Paper	159 units	284 units	640 units	760 units

WATER POLLUTION[2]

Biological Oxygen Demand (BOD) is used to measure the impact that water borne pollution has on the oxygen available to support aquatic life. The comparison between polyethylene and paper is dramatic :

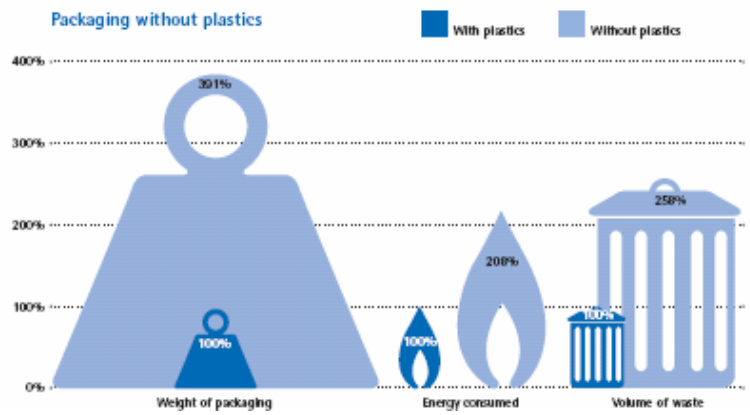
BOD for polyethylene	1 unit
BOD for paper	2155 units

ALTERNATIVES TO PLASTICS

Contrary to what many people believe, packaging without plastics such as Plastazote® foam would actually create problems, not solve them.

This is because plastics tend to be low energy to produce, low weight in use and also allow down-gauging opportunities further reducing weight and also volume.

Estimates for the increased energy requirements, volume of waste, and weights of packaging material for alternatives are shown :



Source: Plastics Europe[3]

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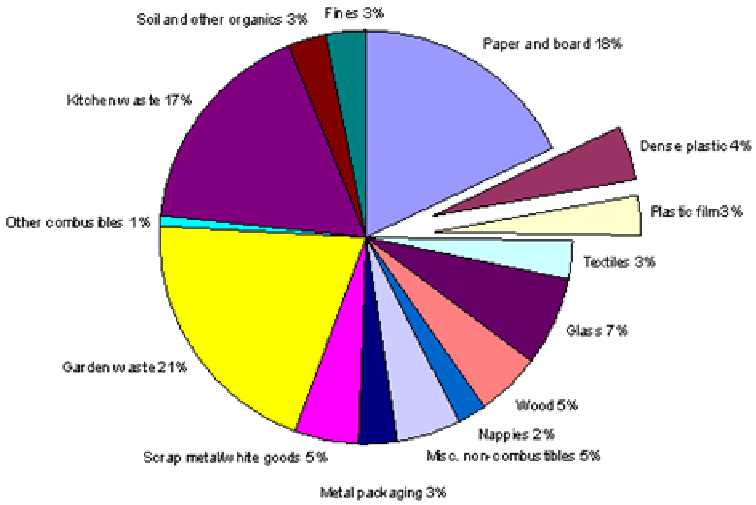
AMOUNT OF WASTE

Polyethylene is a small and quite stable component of the 1.3 billion tonnes[4] of waste produced in Europe on an annual basis.

A comparison with other waste streams is shown to the right.

The vast majority of waste is made up of kitchen waste, garden waste and paper and board (these three waste streams alone account for around 56% of the total tonnage).

By contrast all plastics taken together (which therefore includes polyethylene) make up around 7% of the total tonnage.



Source: WRAP[5]

RECYCLING

Recycling is defined in the Packaging Waste Regulations 1997 and amendments as the reprocessing of materials for their original use or for other purposes.

The cross-linked nature of Plastazote, Evazote and Supazote foam provides superior strength and toughness and thus benefits the customer through enhanced durability. This enhanced durability means that for many applications the foam product can be used repeatedly, reducing the need for replacements.

Several alternative recycling routes are also available :

- Granulation – to convert for use as stuffing / low grade packaging.
- Granulation - for incorporation into other foam and unrelated processes.
- Granulation - re-bonding with heat and/or pressure or adhesives for packaging.

Melt reprocessing of Plastazote, Evazote and Supazote foam materials has been found to be possible if the material is first granulated and densified to aid feeding.

Propozote foam is a polypropylene which is fully melt reprocessable. This allows Propozote foam to be recycled for use in many of the widespread applications requiring polypropylene.

COMBUSTION[2]

At the end of its life cycle, polyethylene still has a useful contribution to make since it contains considerable energy which can be liberated by combustion. Indeed, without polyethylene, domestic waste can be difficult to incinerate effectively.

Polyethylene has a high calorific value of 47 kJ/g from STP and release more energy when incinerated than many other materials. To quantify, the same amount of energy is liberated by 1 kg of polyethylene or 2.75 kg of paper.

DEGRADABLE PLASTIC

There is a widespread belief that degradable plastics are a solution to waste management problems. However, degradability is very dependent on environmental conditions - sun, moisture, bacteria, oxygen and time - and in landfill, where conditions are purposely kept dry to avoid leaching, degradation rates can be extremely slow.

Plastazote foam has been specifically formulated to be a stable and durable material and these useful characteristics would be lost if a degradable formulation were developed.

For these reasons, degradable foam is not considered a helpful approach towards an improved environment.

NITROGEN BLOWING AGENT

The manufacture of some foams requires the use of ozone depleting blowing agents such as CFCs or HCFCs. Others use carbon dioxide, a greenhouse gas, as a blowing agent. Plastazote foam and Evazote foam utilise pure nitrogen for expansion. In essence, nitrogen is borrowed from the atmosphere, used for foam manufacture and then returned to the atmosphere. All Zotefoams products are totally CFC and HCFC free.

ENVIRONMENTAL MANAGEMENT SYSTEM

Zotefoams plc run an environmental management system which has been certified to meet the requirements of ISO 14001:2004. The system is audited externally by BSI.

A summary of our environmental policy, as well as a more detailed document covering environmental performance, is available on our website (www.zotefoams.com).

SUMMARY

To summarise, when considering environmental impacts, polyethylene products in general and Plastazote®, Evazote® and Supazote® foams in particular compare well with other alternative materials. Efficient use of oil and energy resources, avoidance of air and water pollution, absence of ozone depleting agents, comparatively low waste, and the ability to reuse and recycle are examples of the positive contributions Zotefoams products make towards a better environment.

Plastazote®, Evazote®, Supazote® and Propozote® foams are all totally CFC and HCFC free and use only pure nitrogen gas for foam expansion.

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Zotefoams plc
675 Mitcham Road
Croydon
CR9 3AL
United Kingdom
Telephone: +44 (0) 20 8664 1600
Telefax: +44 (0) 20 8664 1616

Zotefoams Inc.
55 Precision Drive
Walton, Kentucky,
41094
USA
Telephone: +1 859 371 4046
Freephone: (800) 362-8358 (US Only)
Telefax: +1 859 371 4734

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[1] http://www.iea.org/Textbase/work/2006/petrochemicals/Schanssema_PlasticsEurope.pdf
[2] BP Chemicals Brochure “Unwrapping the truth - The facts about Polyethylene”
[3] http://www.plasticseurope.org/Content/Default.asp?PageName=openfile&DocRef=20041221-004
[4] http://ec.europa.eu/environment/waste/index.htm
[5] Analysis of household waste composition and factors driving waste increases - Dr. J. Parfitt, WRAP, December 2002