



SELECTION GUIDE FOR THE RECYCLING OF EXPANDED POLYSTYRENE (EPS)

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Introduction:

The Expanded Polystyrene Association of Southern Africa (EPSASA) currently under the aegis of AAAMSA promotes that part of the building and construction industry which specializes in commercial, residential and cold room insulation.

Membership consists of raw material and equipment suppliers and converters of expanded polystyrene.

This Selection Guide aims to respond to the popular misconception that EPS is not recyclable. Polystyrene foam can and is most definitely recycled.

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INTRODUCTION

Expanded Polystyrene foam (EPS) can and is most definitely recycled. Before we get into details of recycling options, more about Polystyrene. If we continue to condemn products without demanding the full facts, and facts about the alternatives, we will never achieve our common goal: **continuous improvement in environmental protection.**

Polystyrene is a very versatile product and it is used in such wide ranging applications as food and transport packaging, insulation products, photographic and CD cases, coat hangers, video cassettes, refrigerator linings, horticultural containers, toys, shoe heels and a range of office and desk equipment.

THE POLYSTYRENE INDUSTRY CARES ABOUT YOU AND THE ENVIRONMENT

As a proud member and licensee of the ENVIROMARK, the plastics industries environmental initiative, the Polystyrene industry are actively involved and support various consumer awareness and educational campaigns based around polystyrene litter, waste and recycling.

1. LAND FILLING: THE LAST RESORT

Polystyrene Foam Products are highly visible and are attracting a disproportionate share of criticism as a source of solid waste. It actually only accounts for about one-quarter of one percent of our solid waste.

EPS waste is effectively and safely disposed of in landfill, without any harm to the environment. Lightweight, it is easier to compress than traditional packaging materials. EPS is also non-degradable, which is a benefit in a landfill environment. Contrary to what most people believe, neither paper nor plastics are easily degradable in today's landfills where lack of water and oxygen actually retard decomposition.

The inclusion of EPS assists aeration resulting in accelerated decomposition. It does not pollute the air, the ground or the ground water

A typical Municipal Solid Waste Stream will have the following composition:

- *Paper and Paper Board:* 37.1%
- *Glass* 9.7%
- *Metals* 9.6%
- *Plastics* 6.9%
- ***Polystyrene Foam* 0.26% (*Expanded Polystyrene*)**
- *Rubber and Leather* 2.5%
- *Textiles* 2.1%
- *Wood* 3.8%
- *Food Wastes* 8.1%
- *Garden Refuge* 17.9%
- *Misc. Organic Waste* 1.8%

2. EXPANDED POLYSTYRENE AND LITTER

A widely held misconception is that litter is a problem caused by specific materials themselves e.g. EPS rather than aberrant consumer behaviour. The reality is that some people improperly dispose of materials by littering. To address concerns effectively, the EPS industry supports the Enviromark, the plastics industries environmental initiative, that work to prevent plastics litter across the country

3. ENERGY EFFICIENCY

Although EPS comes from petroleum, an energy feedstock, it actually saves energy versus alternative packaging! Because polystyrene is thin, lightweight, and highly durable, it reduces the amount of packaging required to protect food, which means better fuel economy during transportation and fewer exhaust emissions. As insulation it prevents wastage of energy resources to heat in winter and cool in summer again reducing emission that would pollute the environment In addition, EPS has a high fuel energy value for waste-to-energy incineration plants. This means that EPS, together with other high-energy materials, raises the temperature in incinerators to such an extent that no additional fuel is needed for proper combustion. Most experts agree that making durable, technologically advanced products from petroleum is one of the most efficient uses of this resource.

4. EPS - THE ENVIRONMENTALLY SAFE WAY TO PACKAGING

Since EPS can be moulded into an infinite variety of shapes for a wide range of uses, it has become an integral part of our society. In the dairy industry, polystyrene is used to make plastic containers for margarine, yogurt and cottage cheese. In the service ware and catering industries, disposables such as cups, plates, cutlery and trays made from polystyrene keep business running smoothly and safely.

For example, EPS service ware means no leftover food particles, no risk of transmitting infections- important attributes not only for restaurants, but for hospitals and airlines as well.

EPS does not harbour bacteria, which is an increasing concern among health specialists. EPS also prolongs the shelf-life of food. Food and beverages stay warmer, cooler and fresher longer, resulting in less food and packaging waste due to spoilage, damaged packaging and leakage.

The other advantage of using polystyrene disposables is that they don't need a great deal of water to clean them. Using water for cleaning can place a heavy burden upon the environment. Clean, fresh drinking water is becoming an increasingly precious commodity. In addition, large institutions like hospitals and caterers still can't use phosphate free materials in their dishwashers. Just think about the amount of salt, phosphates, and food residue (oil, sauces and fat) that go into wastewater.

5. RECYCLING OF EXPANDED POLYSTYRENE

The recycling of EPS has increased dramatically during the last decade. In South Africa the EPS industry support the recovery of post - consumer EPS through the Enviromark recovery projects as well as from major office buildings and catering establishments. EPS is not only energy efficient, but once the density is increased to solid by removing the entrapped air, it saves as a natural resources, because it can be recycled several times.

The air is removed in a special extruder to form solid thermoplastic pellets ready for injection moulding or extrusion.

Even the scrap material arising from manufacturing processes are also being recycled and converted into various products. Examples of products made from recycled EPS are picture frames, cafeteria trays, audio and visual cassettes, seedling trays and coat hangers.

6. RE-USE IN THE BUILDING INDUSTRY

In the building industry scrap EPS is granulated and mixed with binders, (special cements and clays), to render lightweight mixture with load bearing and insulating properties. These mixtures are then used to manufacture lightweight structural building panels (cf. Fig. 1) or bricks with excellent insulating properties. Alternatively wet mortar/foam granulate mixtures can be applied to existing structures resulting in coatings with varying degrees of thermal resistance (insulation), strength, noise attenuation and fire resistance (cf. Fig. 2).

Fig. 1 Lightweight Construction Panels



Fig. 2 Lightweight Mortar



7. RE-USE AS FILLING MATERIAL

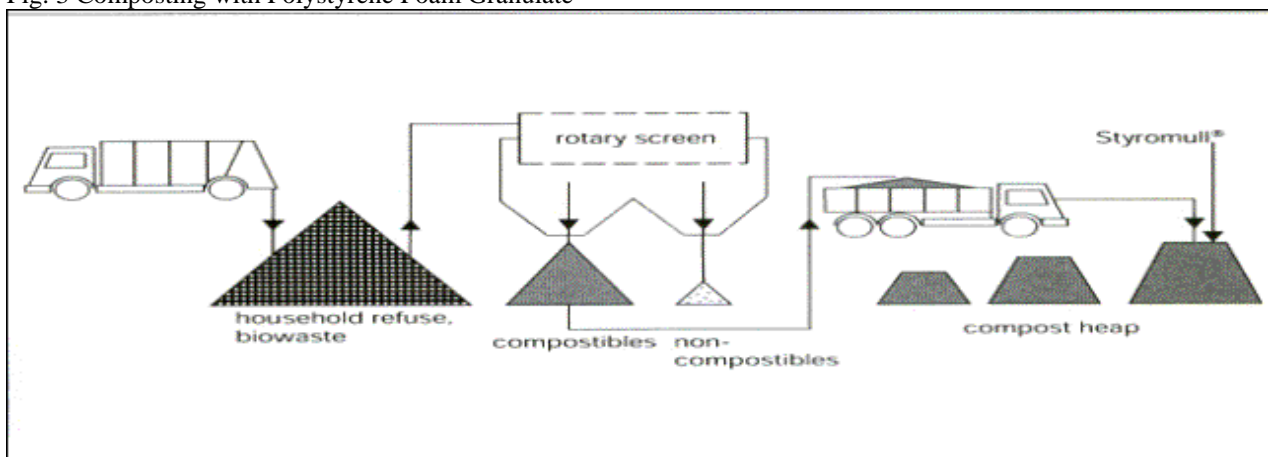
In South Africa all the bean bags and similar furniture items are being filled by granulated scrap EPS products. Scrap is collected, cleaned and granulated for this application.

8. SOIL IMPROVEMENT

Scrap EPS is granulated into small fragments and mixed with soil and other composting agents to improve soil (Fig 3). This tried and tested application has been in existence for decades.

The product is odourless, chemically neutral, and compatible with plants. It helps horticultural soil stand water better, lighten heavy soils and helps drain waterlogged soils.

Fig. 3 Composting with Polystyrene Foam Granulate



9. SOURCE OF FUEL

If EPS is not recycled, it can be safely incinerated. Today's incinerators have the technology to recover the high energy contained in plastics, including polystyrene.

This energy is used to assist in the efficient combustion of household waste and recovered for electrical power generation and heating. When properly incinerated, EPS produces carbon dioxide and water, which are normal components of our environment (Fig 4). Although carbon dioxide is considered to be a contributing factor to the "greenhouse effect" the proper incineration of EPS with energy recovery emits far less carbon dioxide to the atmosphere than burning the same amount of oil or gas for domestic and industrial heating.

Some people are concerned that incinerating EPS releases toxic substances into the air. This is untrue with modern incineration.

Fig. 4 Modern Municipal Incinerator

