



Building a better environment

with EPS

*Safeguarding
our future through
its complete life-cycle*



European Manufacturers of EPS

What is EPS?

Expanded Polystyrene, or EPS for short, is a lightweight, rigid, plastic foam insulation material produced from solid beads of polystyrene. Expansion is achieved by virtue of small amounts of pentane gas dissolved into the polystyrene base material during production. The gas expands under the action of heat, applied as steam, to form perfectly closed cells of EPS. These cells occupy approximately 40 times the volume of the original polystyrene bead. The EPS beads are then moulded into

appropriate forms suited to their application.

Who needs EPS?

Anyone who needs to thermally and acoustically insulate walls, roofs or floors will find EPS the ideal, cost-effective and easy-to-use material in all types of buildings, from houses and offices to factories and schools. EPS is used by civil engineers as a lightweight fill or void-forming material. It is also used as a flotation material.

User benefits

Excellent thermal insulant

EPS is 98 percent air, and is therefore an excellent thermal insulant.

Proven acoustic insulant

EPS absorbs sound, both impact sound in floating floors and airborne sound for walls.

Moisture resistant

EPS resists degradation by water.

Lifetime durability

EPS does not decompose. It therefore provides lifetime durability.

Flexible mechanical properties

With its flexible production process, the mechanical properties of EPS can be adjusted to suit every specified application.

Versatile

EPS can be manufactured in almost any shape or size, and is compatible with a wide variety of materials.

Cost-effective

EPS offers the best price/performance ratio compared to any other insulation material.

Easy to transport

EPS is almost as light as air, so it saves fuel in transport.

Easy to install

EPS is light, practical, safe and easy to handle and install.

Fire retardant

In addition to 'standard EPS' there is also a 'self extinguishing' version that includes a fire retardant.

Why is it the best?

In addition to many significant user benefits, EPS offers substantial environmental advantages. Use of EPS actively contributes to a better environment. Some of the ways in which it does so are outlined below. Moreover, EPS makes this positive contribution at all stages of its life-cycle, from manufacture, to application, to recycling or disposal.

Environmental benefits

Extremely safe

EPS is non-toxic and totally inert. It contains no Chlorofluorocarbons (CFCs) or Hydrofluorocarbons (HCFCs), and never has at any time during its life-cycle. It is also totally absent of any nutritional value, so no fungi or micro-organisms can grow within EPS.

Recyclable

EPS can be recycled in many ways once it comes to the end of its life. These include recycling directly into new building products and incineration to recover its inherent energy content. The choice of a recycling method is based on technical, environmental and economic considerations.

Health Aspects

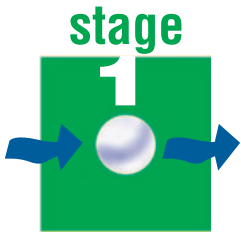
EPS presents no dangers to health in installation and use.

Fulfils all fire and safety requirements

All EPS building applications, as promoted by the European EPS Industry, fulfil local regulations in every European country.



10 kg of EPS saves 4000 litres of oil over a 50 year period.



Manufacture

The manufacture of EPS conforms to the most stringent health and safety requirements in Europe.

The manufacturing process

There are five manufacturing stages:

Pre-expansion - Polystyrene granules are expanded by free exposure to steam to form larger beads, each consisting of a series of non-interconnecting cells.

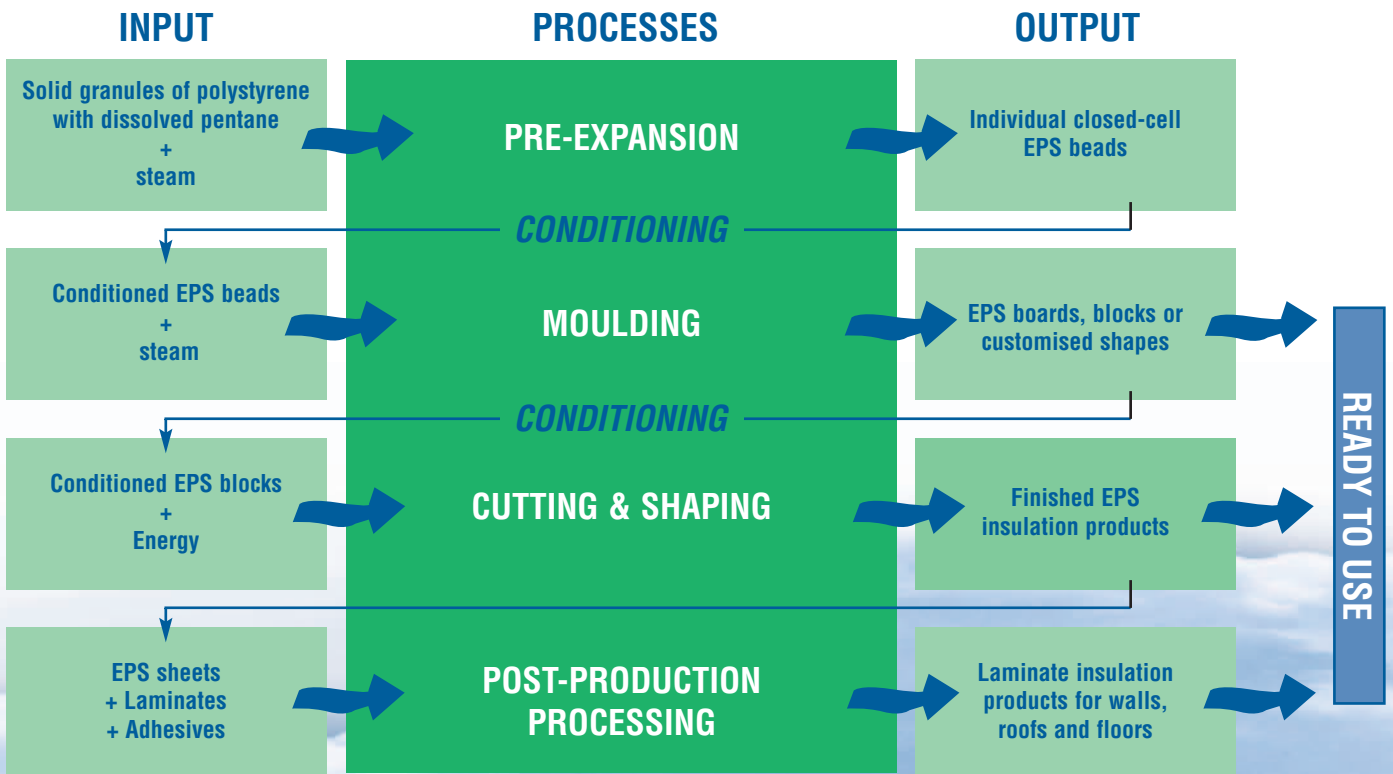
Conditioning - After expansion, the beads still contain small quantities of both condensed steam and pentane gas. As they cool, air gradually diffuses into the pores, replacing, in part, the other components.

Moulding - The beads are moulded to form boards, blocks or customised products. The mould serves to shape

and retain the pre-foam, and steam is again used to promote expansion. During moulding, the steam causes fusion of each bead to its neighbours, thus forming a homogeneous product.

Shaping - Following a short cooling period, the moulded block is removed from the machine, and after further conditioning, may be cut or shaped as required using hot-wire elements or other appropriate techniques.

Post-production processing - The finished product can be laminated with foils, plastics, roofing felt, fibreboard or other facings such as roof or wall cladding material.



Use

EPS maintains effective performance for the entire life of a building.

Use of EPS products makes a positive contribution to health and safety.

It remains effective for the entire life of the construction in which they are used. The energy used in the EPS

production process is recovered many times over by the energy saved in the buildings in which it is installed. One kg of EPS saves at least 400 litres of oil over 50 years. EPS construction products comply with all European

building, fire and safety regulations for the application in which they are used, even though they vary from country to country.

Some insulation materials are not usually associated with 'good health'. EPS, however, is universally recognised as a non-harmful, pleasant material to work with. It is non-toxic, does not sting hands, irritate skin or nostrils, and has no known adverse effect on health. In its end-use condition, EPS presents no health risks whatsoever.

Performance

In use, EPS is resistant to moisture and maintains a consistent level of thermal and acoustic performance.



Recycling/Recovery

EPS can be treated in the most environmentally appropriate manner via its range of waste management options

Reduction

It is a common misconception that many of our waste problems are caused by plastics. In fact, the total amount of plastics in our municipal solid waste is only seven percent by weight. Of this, EPS accounts for only a very small fraction - just 0.1 percent. EPS products used in the construction industry have a very long effective lifetime because of their durability, so disposal of the product is minimised.

Recycling/Disposal schemes

There are several options to treat EPS building and demolition waste, each with environmental, technical and economic implications to consider when choosing the best option to implement in any one place.

Generally the most beneficial is direct re-use by grinding clean EPS waste and adding it to virgin material during production. This waste can also be used to improve soil condition.

Alternatively, EPS can be melted and extruded to make compact polystyrene, for items such as plant pots, coat hangers and a wood substitute. Medium toughened polystyrene from which sheets for thermoformed articles, such as trays, can also be made. As part of mixed plastic waste, EPS can be recycled to make, for example, park benches, fence posts and road signs, ensuring the plastic material has a long and useful second life.

Energy recovery

This involves the recovery of energy, usually in the form of heat from incineration. This gives EPS-waste a

Reduced fire risk

In almost all applications, EPS is covered by other building materials, such as concrete, brickwork or plasterboard, therefore minimising the fire risk to the EPS.

EPS is also available in fire retardant grades when required. These are more difficult to ignite than standard grades, offering further protection during installation.

The gases and vapours given off by EPS in a fire are less dangerous than those from many natural materials, such as timber and cork.

genuine post-consumer use.. The calorific value of EPS available for heat recovery is slightly more than that of coal by weight.

In a modern incinerator, EPS releases most of its energy as heat, aiding in the burning of municipal solid waste and emitting only carbon-dioxide, water-vapour and a trace of non-toxic ash. The fumes are non-toxic and are not harmful to the environment as no dioxins or furans are emitted. The energy gained can be used for local heating and the generation of electricity.

Landfill

Although currently a large proportion of EPS waste is disposed of in landfill, it is EUMEPS' least preferred option since it does not create a 'second life' and is therefore not an optimal use of natural resources. However, landfill using EPS does bring advantages. EPS waste is inert and non-toxic, so the landfill site becomes more stable. EPS aerates the soil, encouraging plant growth on reclaimed sites. EPS does not degrade and will not leach any substances into ground-water, nor will it form explosive methane gas.

EUMEPS' role in waste management

EUMEPS as a whole has adopted responsibility for post-life EPS. It endorses the need to minimise the amount of materials used in every application by delivering 'just the necessary amount', thus reducing the amount of waste from off-cuts. EUMEPS promotes any concept which is environmentally, technically and economically beneficial.

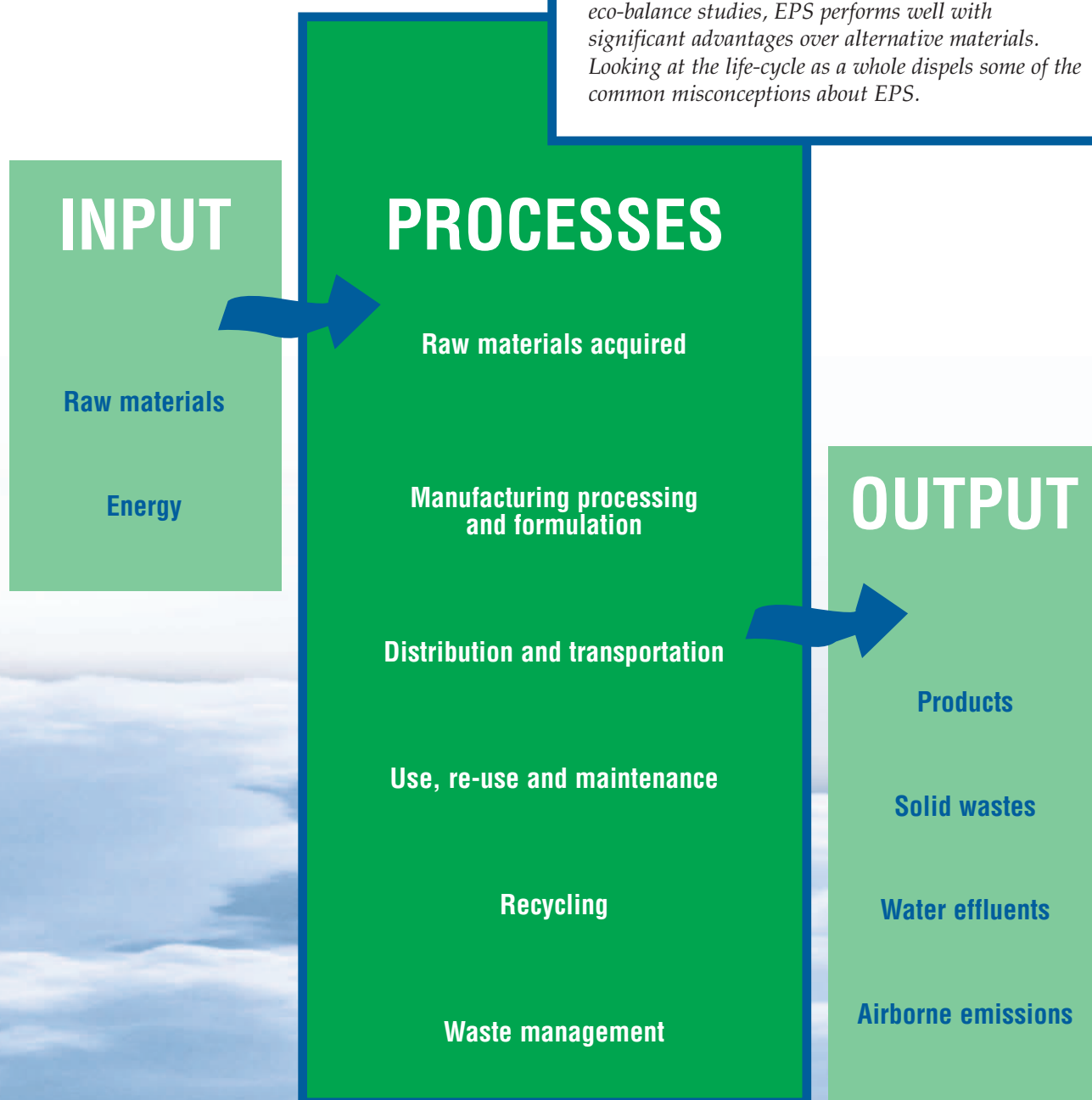
EPS - taking care of the environment

Today, people in all walks of life are concerned about the environment, and measures are being taken in all industries to reduce the impact that activities have on our surroundings.

For today's building and construction industry, concerns are being addressed by the careful choice of building materials, and in particular, the selection of insulation. One product which can contribute towards a better environment in this field is EPS.

The EPS life-cycle

EUMEPS sees the active lifetime of a product as starting with the extraction of raw materials and ending beyond disposal. That is why EUMEPS works with the results of independent eco-balance studies, or life-cycle analyses, which study the environmental impact of a material as a whole, taking all stages of the product's lifetime into assessment. In eco-balance studies, EPS performs well with significant advantages over alternative materials. Looking at the life-cycle as a whole dispels some of the common misconceptions about EPS.





Who is EUMEPS?

EUMEPS stands for the European Manufacturers of Expanded Polystyrene (EPS). It reflects the interests of all of Europe's leading EPS manufacturers through national associations.

There are two interest groups within the organisation: EUMEPS Packaging and EUMEPS Construction.

EPS comprises 35 percent of the total building and construction insulation market with 10,000 people directly employed in the EPS industry.

Founded in 1989, EUMEPS now has the support of 95 percent of the European EPS industry.

EUMEPS acts as an intra-industry task force, monitoring and co-ordinating a continuous process of improvement in European EPS manufacture with 'cradle to grave' responsibility for the products. This is achieved via working groups focused on:

- Health, Safety and the Environment
- Standardisation
- Fire safety
- Communications.

EUMEPS is a partner on a European level for economic, political and technical issues to relevant parties including the building and construction industry, legislative authorities, architects, engineers, developers and consumers.

Further information on EPS for the construction industry is available from

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*International/non-profit association
Eumeps August 2002*

