

# EPS and the Environment

## Environmentally Friendly

The excellent properties of EPS, providing economic and high performance products, are further enhanced by its environmentally friendly characteristics. By most methods of measurement, EPS has a positive contribution to the environment at every stage of its life cycle.

From raw material production, to processing into useable products, to the daily use of those products, to disposal or recycling EPS uses less energy, saves more energy, or has fewer emissions and creates less environmental impact on disposal than most competitive materials.

Objective, scientific studies have demonstrated the benefits to the environment of using EPS in preference to other materials.

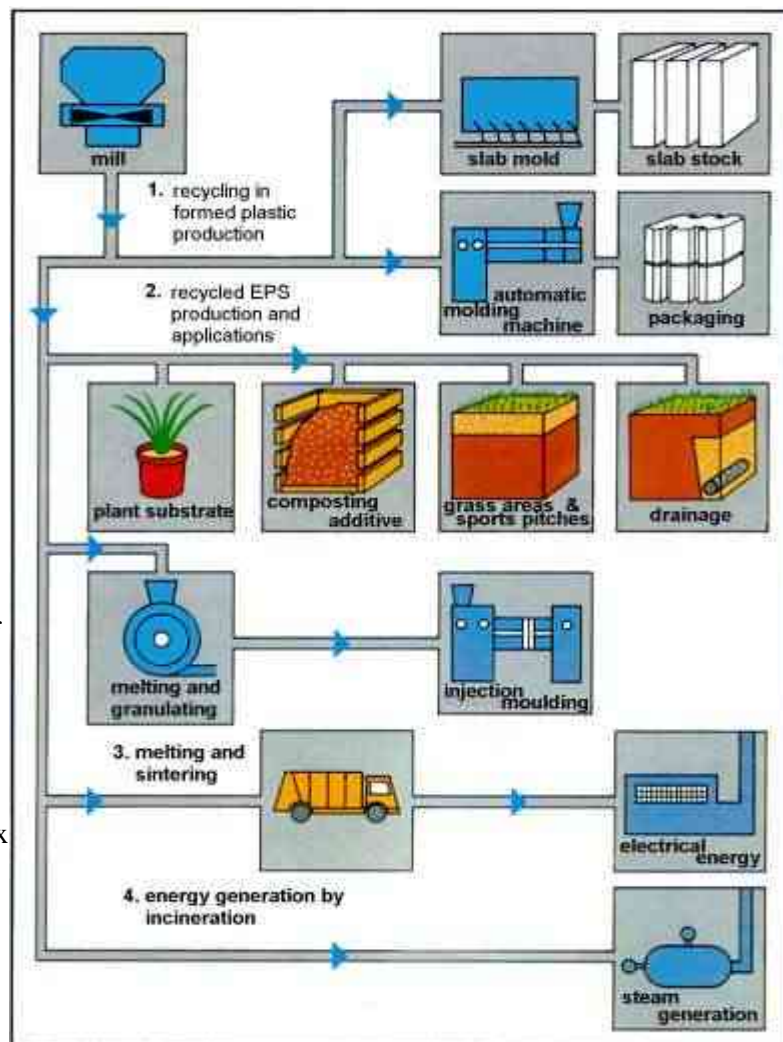
The manufacture of disposable drinking cups demonstrates dramatically the resource and energy efficiency of EPS.

Compared with EPS cups of the same size, **paper cups consume:**

- 170 times as much process water
- 30 per cent more cooling water
- 15 times more chemicals
- 13 times more electricity
- 6 times as much steam

Because of its light weight, on an equal volume basis EPS is only one-sixth of the weight of cardboard.

Compared to EPS, other packaging materials such as wood, corrugated cardboard and paper weigh on average six and a half times as much, require twice as much energy to produce and result in two-thirds more waste by volume.



**Reduced Effects on Atmosphere**

In terms of global warming, EPS plays a positive role in reducing carbon dioxide emissions. Domestic and industrial consumption of fossil fuels for heating is recognised as a significant contributor to the global output of carbon dioxide. It has been estimated that the effective application of EPS insulation could cut carbon dioxide emissions by up to 50%.

As the insulation performance of EPS does not deteriorate during its lifetime, this reduction in emissions lasts the full lifetime of a building. The manufacture of EPS raw material and processing into useable products does not require the use of CFCs or HCFCs.

**Minimises Waste on Disposal**

EPS accounts for less than a tenth of one percent of the weight of municipal waste. The foam scrap improves the aeration of landfills and thus contributes to a faster degradation of the organic substances.

EPS products do not degrade into harmful substances, are not water soluble and do not give off any water soluble substances which could lead to contamination of ground water.

**Efficient use of Resources**

The most effective way to reliably assess the overall environmental impact of materials is by 'Life Cycle Analysis'. This internationally accepted method evaluates all impacts, including raw material processing, product manufacture, energy consumption in processing, manufacture and use, and effects on the environment of disposal and recycling. There are many examples which illustrate the benefits of using EPS.

EPS is produced from oil and as it comprises approximately 98% air, it consumes only a small fraction of one percent of oil use. On a volume basis, EPS production uses between one third and one half of the energy required for an equal volume of cardboard. Many homes, coolstores, commercial and industrial buildings use EPS for insulation to save valuable energy.

Raw materials needed to make one cup		
EPS		Paper
0g	Wood and bark	22g
4.3g	Petroleum	1.8g
0.8g	Other chemicals	1.2g

Utilities required per 10,000 cups		
130kg	Steam	850g
6kWh	Electricity	78kWh
3m <sup>3</sup>	Cooling water	4m <sup>3</sup>
0.06m <sup>3</sup>	Process water	10m <sup>3</sup>

Uncoated paper cup average weight 2 grams



EPS foam cup average weight 2 grams



Home insulation can reduce heat losses by up to 70%. For each kilogram of oil used in the manufacture of EPS insulation, savings of up to 200 kilograms of heating fuel can be made over the average life of a house.

The World Health Organisation estimates that up to 30% of food stuff production is lost through lack of suitable storage, transport and packaging.

EPS plays a vital role in reducing this unnecessary waste by being the first choice for cool store insulation and insulated food containers - EPS food packaging allows the safe transportation of food by air and road ensuring it reaches its destination without deterioration.

### **Recyclable**

EPS can be readily recycled in several ways. Within the processing plant, internal waste can be ground and mixed in various proportions with virgin material in the production of EPS blocks and mouldings.

Recycled material is used for the manufacture of drainage board.

Recycled EPS can also be mixed with plaster to provide insulated coatings, and concrete to produce light weight blocks.

When melted, EPS becomes solid polystyrene and shrinks to its original volume. Once solidified it is reground into solid granules and used in the production of simple polystyrene products such as pens, coat hangers and cassette tapes.

The NZ EPS sector group is currently working with the Recycling Operators of New Zealand to establish better access to EPS recycling technology and facilities in New Zealand.