

Type of company	Company name	Location/ Head Office	Comments	Products/Service	Contact		Website
					Name	Phone / Email	
Compaction equipment	RUNI	Denmark	Danish manufacturer of EPS compactors	Manufactures EPS compactors		+45 97 37 1799 runi@runi.dk	www.runi.dk
	Easywaste	National/ Glasgow	Compactor supplier	Waste management company		0141 952 9525	www.easywastesolutions.co.uk
	Taylor Products Ltd	Cardiff	Established UK engineering company	Makes machines for thermal densification of EPS and plastics	David Scheeres	029 2038 4416 Dscheeres@aol.com	www.i-tpl.com
	Next-tec	Stoke on Trent	Offers a range of services	Makes machinery for thermal densifying EPS	Mark Smith	07900 261506	www.next-tec-ltd.com
	Greenbank	National/ Middlesbrough	Agents for RUNI in the UK	Sale or lease of EPS compactors and waste handling equipment. Buys compacted EPS	Duncan Evershed	01642 249924	www.runi.dk
EPS recycling companies	Enviro (GY) Ltd	Grimsby	Collects and compacts used EPS fishboxes, exports compacted EPS	Local compaction service for EPS fishboxes in Grimsby	Steve Rowlands	01472 242120	
	Fishgate	Albert Dock, Hull	Compacts used EPS boxes	Local compaction service for EPS fishboxes in Hull	Kristjon Bergmundsson	01482 380400	www.fishgate.co.uk
	CK Polymers	Cheshire	Buys compacted EPS	Plastics recycling	Mark Whitney	07801 643322 mark@ckpolymers.co.uk	CK Polymers
	Mammen	Denmark	Buys compacted EPS Europe-wide	Waste recycling	Flemming Bonde	+45 20 72 21 92	www.harm-mammen.dk
	euro.recycle.net		Lists different plastics recyclables & companies with recycling services				euro.recycle.net
Alternative packaging	Tri-Pack	Grimsby	Corrugated plastic, flatpack fishbox (EPS alternative)	Produces Coolseal fishbox	Stephen Clarke	01472 355038 Stephenc@tri-pack.co.uk	www.tri-pack.co.uk
	Sundolitt Ltd	Paisley	Packaging with various materials	'Correx' boxes with plastic corrugated board	Kenneth Muir	0141 887 1123 Kenneth.muir@sundolitt.com	www.sundolitt.com
	D S Smith Packaging	Berkshire	International Packaging company	Waterproofed cardboard boxes for seafood transport		01753 754380	www.dssmith-packaging.com
Research	Wales Environmental Trust	Caerphilly South Wales	Actively researching fishbox eps options for UK recycling	Buys compacted EPS	Dr. Keith Parry	01443 866 300	www.walesenvtrust.org.uk
	Brunel University	Middlesex	Seeks collaborators in the seafood sector	Researching Bio-degradable packaging	Prof. Jim Song	01895 266 692 Jim.song@brunel.ac.uk	www.brunel.ac.uk
Advisory organisations	Expanded Polystyrene Packaging Group	London	Good website full of useful information	Information on recycling EPS, machinery, legislation etc	Damian Packer	020 7457 5014 info@eps.co.uk	www.eps.co.uk
	British Plastics Federation	London	Trade Association of the UK Plastics Industry			020 7457 5000 bpf@bpf.co.uk	www.bpf.co.uk
	ENDAT Process Engineering Compendium	Stirling	Extensive list of products and services	Includes various types of waste handling machinery		01786 407000 info@endat.com	www.endat.com/pesc.cfm
Regulators	DEFRA, SEERAD, DARDNI & National Assembly for Wales	England, Scotland, Northern Ireland and Wales	Useful websites	FIFG Grants			www.defra.gov.uk www.scotland.gov.uk www.dardni.gov.uk www.wales.gov.uk

### Introduction

Expanded polystyrene (EPS) fishboxes are widely used throughout the seafood industry for transporting all types of chilled products due to their thermal, shockproof and waterproof properties. However, for many seafood processors or wholesale markets, the disposal of used polystyrene fishboxes can be an expensive and difficult problem. But there are alternatives to simply throwing whole EPS boxes in the bin. Used EPS fishboxes are being successfully and profitably recycled throughout the UK.

This document describes various options for the disposal or recycling of used EPS and provides a list of contacts and agencies who can give further assistance.



### Legal obligations for large companies

There are legal requirements for recycling packaging waste under the Producer Responsibility Obligations (Packaging Waste) Regulations. However, these only apply to UK companies or groups of companies that have a total annual turnover of more than £2m and handle over than 50 tonnes of packaging per year. For further information on this, contact your local environmental regulator (Environment Agency in England and Wales, SEPA in Scotland and DARD in Northern Ireland).

# technology implementation Key Features

## Alternative disposal of polystyrene fish boxes



### Disposal of polystyrene

Companies are allowed to dispose of used EPS boxes to landfill provided any seafood waste has been removed. Your local authority can advise further on waste disposal services for used packaging.

Businesses with regular quantities of EPS boxes should consider the use of compactors to initially reduce the volume of EPS that is thrown away, which in turn could save money by reducing the number of times the bin requires emptying.

### Recycling polystyrene

There are two main options for recycling EPS waste; incineration - yielding energy-recovery, and recycling into other forms such as garden furniture and building insulation. Both require the EPS to be compacted first.

### Compacting polystyrene

Compaction can be carried out with heat (thermal densification), or without heat (cold compaction).

Cold compaction involves crushing and compacting fishboxes by machine. The compacted boxes are extruded into a solid 'tube'. The tube is cut to length to fit onto a pallet. It is usual for the compacted EPS to be stored on-site until 5 to 25 metric tonnes are available, as this makes transport and distribution more cost-effective. The more densely compacted the EPS is, the better, since a higher weight of EPS can be loaded for transport and a higher price per tonne may be paid by the recycler. Cold compaction can reduce EPS volume down to one-fortieth of the original. For shipping overseas the EPS is hand loaded into a forty-foot sea container (requiring 15-25 Tonnes).

Thermal densification involves breaking up and heating EPS inside a controlled-temperature chamber. The temperature is accurately controlled to allow the EPS to melt without burning. This collapses the expanded foam cells, enabling it then to be recycled into other products. Higher compaction ratios (up to 95% volume reduction) can be achieved using higher temperatures but the end product has fewer recycling options and is most suited to incineration with energy recovery or disposal to landfill. Thermal densification equipment will also treat and densify other plastic waste products, eg plastic drinks bottles. If there are paper labels included with the fishboxes the thermally-densified product cannot be recycled. However it can be burnt/incinerated for energy recovery.



### Prices for compacted EPS

The price that recyclers will pay ranges from around £400 to £500 per tonne but is very much market dependent as it is linked to world oil. It also varies according to location, cleanliness, level of compaction and current market situation. Contaminants such as seafood waste, oils, excess moisture, ice, malodours and the presence of paper labels can create problems for recycling and reduce the prices paid.

### Compaction Equipment

Machines for cold compacting and thermal densification of EPS fishboxes are available to hire or buy within the UK from a number of sources. Both types of equipment have various sizes of machine available, with varying throughputs and capacities. See below and 'further information' section for details.



Details of some machines suitable for cold compaction or thermal densification

Make	Cold compact or Thermal densify	Model	Throughput (Kg/hr)	Phase required	Power reqt (KW)	Cost approx (£)	Compaction ratio	Length (m)	Width (m)	Height (m)
RUNI	Cold	SK370	200	3	16.5	23 K	37:1	5.33	1.35	2.2
RUNI	Cold	SK240	70	3	7	15 K	37:1	4.3	1.35	2.2
RUNI	Cold	SK120	25	3	1.5	7K	37:1			
Taylor	Thermal	TP1000	10	1	6.5	9 K	90:1	0.9	0.6	1.8
Taylor	Thermal	STYROMELT	35	3	8	10 K	90:1	1.08	.98	1.97
Taylor	Thermal		500			150 K	90:1			
Next-tec	Thermal	DSRW	250	3	40	40 K	90:1	3.5	1.4	2.0

For a company with around 25 tonnes of EPS per year, the payback period for a compacting machine costing around £20,000 can be as short as two years, if the compacted EPS is sold to a recycling company for about £50 per tonne and the costs of disposal to landfill are saved.

In England, FIFG grant assistance of 20-30 per cent funding is available for capital costs of EPS compacting machinery. For further information contact Steve Bailey on 07876 035733 or email [s\\_bailey@seafish.co.uk](mailto:s_bailey@seafish.co.uk). Similar FIFG funding may be available in Scotland, Northern Ireland and Wales. See contacts list for details of the relevant regulator.

### 'Regional' collection/recycling schemes

For companies with a large volume of EPS waste, it may be cost-effective to establish an in-house EPS compaction facility, to supply EPS recyclers direct. Alternatively companies within a similar area may benefit from a communal collection and compaction service. For example, Fishgate in Hull provides this service for seafood processors and other businesses in Hull and the surrounding area. Similarly in Grimsby, ENVIRO (GY) Ltd, offers an EPS recycling service to the seafood sector within the Grimsby area, although they have recently established Scottish and London based initiatives. Both these organisations carry out EPS compaction and export the material, charging seafood companies for providing this service.

### Alternative materials to EPS

Businesses with a well-managed distribution chain (guaranteed 0 to 4°C at all times), may not require the highly effective insulative properties provided by EPS. Alternative

types of packaging are available which perform very well in chilled distribution systems. These include waxed cardboard, corrugated plastic, and plastic pouches or trays although new materials are emerging all the time. For example an EU project due for completion in August 2005 has been developing a novel alternative material to EPS with good insulation and designed to be re-used a number of times.

### Further information

Further information on these areas and relevant contact details are available in the following table. The list is not exhaustive but merely indicative of products or services currently available. Their inclusion on the table does not infer that Seafish in anyway endorses their products or services. Any companies that wish to be added to the list should contact the Technology Implementation department at Seafish by emailing [t\\_misson@seafish.co.uk](mailto:t_misson@seafish.co.uk).