

SAFETY DATA SHEET

MONOCELL[®] F



Ravago EPS
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According to Regulation (EC) No. 1907/2006 REACH

1 IDENTIFICATION OF THE PRODUCT AND THE COMPANY/ undertaking

1.1 Identification of the product

Chemical name:	Expandable Polystyrene
Designation or trade name:	MONOCELL [®] F
Commonly used synonyms:	FR-EPS, Flame retardant expandable Polystyrene Poly(phenylethene)

1.2 Use of the product:

Used mainly as raw material for the manufacturing of foamed thermal insulation and for an extensive range of cushioning and insulation packaging. The finished goods are produced with a molding process combined with the use of steam.

1.3 Identification of the company

Responsible for placing on the market:

MONOTEZ S.A.

Address: 111 Lefkis str., 145 68 Kryoneri Attikis, Athens, Greece

Tel: (+30210) 2811135, Fax: (+30210) 2818726

e-mail: info@monotez.com

1.4 Emergency calls

Emergency telephone number: (+30210) 2811135, (+3022620)31257

Official advisory body telephone number: (+30210) 2811135, (+3022620)31257

2 HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

2.1.1 According to Directive (EC) 67/548/EEC or 1999/45/EC

In use, may form flammable / explosive vapour – air mixture.

2.1.2 According to Regulation (EC) 1272/2008 (CLP)

In use, may form flammable / explosive vapour – air mixture.

2.2 Label elements

According to Directive (EC) 67/548/EEC or 1999/45/EC

R-phrase(s)

R18: In use, may form flammable / explosive vapour – air mixture.

S-phrase(s)

S16: Keep away from sources of ignition - No smoking.

S33: Take precautionary measures against static discharges.

S3/7: Keep container tightly closed and in a cool place.

S9: Keep container in a well-ventilated place.



<http://www.monotez.com>
info@monotez.com

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2.3 Other hazards

Product releases pentane which may cause irritation to skin and eyes





3 COMPOSITION / INFORMATION ON INGREDIENTS

3.1 General description of the ingredients, their concentrations and hazards






Product description: Polystyrene (CAS N° 9003-53-6), containing pentane isomers as blowing agent and a brominated flame retardant.

3.2 Hazardous ingredients

3.2.1 According to Directive (EC) 67/548/EEC or 1999/45/EC

Component name	CAS number	EC number	Content	EC hazard	R phrases
Pentane (mixed isomers)	109-66-0; 78-78-4	203-692-4 201-142-8	<7%	 F+,  Xn,  N	12, 51/53, 65, 66, 67
Hexabromocyclododecane	25637-99-4; 3194-55-6	247-148-4; 221-695-9	≤1%	 N	50/53

3.2.2 According to Regulation (EC) 1272/2008 (CLP)

Component name	CAS number	EC number	Content	Reach Registration No	Hazard pictograms	Hazard codes
Pentane (mixed isomers)	109-66-0 78-78-4	203-692-4 201-142-8	<7%	01-2119459286-30 01-2119475602-38	 GHS02	H224
					 GHS07	H336
					 GHS08	H304
					 GHS09	H411
Hexabromocyclo dodecane	25637-99-4; 3194-55-6	247-148-4; 221-695-9	≤1%	01-2119539454-36	 GHS09	H361, H362, H400, H410

4 FIRST AID MEASURES

Required immediate medical attention: See below first aid.

Symptoms and effects: Pentane vapors at increased concentrations are irritant and affect the nervous system.

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- Inhalation: Symptom:** Vertigo, headache, dizziness, lack of coordination.
First aid: Bring the suffering person to fresh air. If recovery does not occur quickly, seek medical assistance.
Expected delayed effects: None.
- Skin: Symptom:** Irritation.
First aid: Wash skin with soap and water.
Expected delayed effects: None
- Eyes: Symptom:** Irritation
First aid: Flush eyes with water for at least 15 minutes, holding the eyelids wide open. If recovery does not occur quickly, seek medical assistance.
Expected delayed effects: None
- Ingestion: Symptom:** Not Available
First aid: Not normally expected to present an ingestion hazard. If ingestion occurs, maintain an open breathing airway and seek medical assistance. Watch for an obstruction in the victim's mouth. Remove if possible but do not force fingers or a hard object between victim's teeth.
Expected delayed effects: Not Available

Specific and immediate means of treatment to be available at the workplace: Not Available

5 FIRE FIGHTING MEASURES

- Suitable extinguishing media:** Water spray, dry chemical powder, carbon dioxide, foam.
Extinguishing media which must not be used for safety reasons: Water in a jet.
Other information: Keep adjacent containers cool by spraying with water.
Special exposure hazards arising from the product, combustion products, evolved gases: The product is not classified as flammable but will burn on contact with flame or exposure to high temperatures. Hazardous combustion products may include carbon monoxide and carbon dioxide; traces of hydrogen bromide can be produced.
Special protective equipment for fire-fighters: Full protective clothing and personal breathing apparatus.

6 ACCIDENTAL RELEASE MEASURES

- Safety information:** Vapors may form an explosive mixture with air. Vapors are heavier than air and may accumulate at ground level or in underground storage areas. Caution: spillages can be slippery.
Personal precautions: Remove ignition source. No smoking. Avoid sparks. Take precautionary measures against static discharge. Avoid standing on spilled product as loose beads cause a slip hazard.
Environmental precautions: Prevent further leakage or spillage and prevent beads from entering drains.
Clean-up methods
Small spillage: Shovel up and place in a labeled, sealable container for subsequent safe disposal.
Large spillage: Transfer to a labeled, sealable container for product recovery or safe disposal.
Other information: See Section 13 for information on disposal.

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7 HANDLING AND STORAGE

7.1 Handling

Safety precautions

Local and general ventilation: Use localized gas extraction over the processing area

Measures to prevent aerosol, dust and fire: Avoid creation or accumulation of dusts. Extinguish any naked flames. Remove ignition sources. Avoid sparks. Do not smoke. Take precautionary measures against static discharges. Earth all equipment.

Measures to protect the environment: Avoid to release the unused product into the environment but dispose in accordance with the local - national regulations.

Specific requirements: Do not breathe vapour. Do not breathe fumes or vapours from heated product.

Handling temperatures: Ambient.

7.2 Storage

Safety conditions

Specific engineering requirements for storage rooms or vessels: Storage rooms should be kept cool to reduce pentane release, and be equipped with a suitable ventilation system which will prevent accumulation of pentane. In addition safety gas detectors and notifiers should be used to alert on pentane/air explosive mixtures build up. The electrical system of the area should prevent sparks. Equipment to be installed in potentially explosive atmospheres should comply to the requirements of ATEX Directive 94/9/EC

Incompatible materials: Avoid storing or handling in conjunction with UN Class 1 explosives.

Storage conditions: To avoid the built-up of static electric charge, and also the formation of an explosive pentane-air mixture, containers should be fully emptied after processing. Reseal plastic liners. Keep containers tightly closed and in a cool, well-ventilated area. Keep away from direct sunlight and other sources of heat or ignition. Keep away from rain, moisture and freezing conditions. Bulk: Keep under inert gas. Open top tanks should be covered with an open rigid grid.

Product transfer: Take precautionary measures against static discharges. Earth all equipment. Ventilate freight containers for one hour before unloading. Line velocity should not exceed 8m/s during normal pumping operations.

Special electrical equipment: Install spark free electrical equipment.

Prevention of static electricity: Take precautionary measures against static discharges.

Quantity limits : Not available

Type of material used in the packaging/containers:

The product is usually put on the market in cardboard octagonal containers (octabins), in big bags or bulk. It is recommended not to double stack octabins. Other suitable containers: steel drums

7.3 Specific use(s)

Recommendations: Not available

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering control measures: Use only in well ventilated areas.

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8.1 Exposure limit values

Product ingredients(see also section 2):

The following are limits for the expanding agent and possible hazardous decomposition products (see section 10); during the conversion process (expansion) the product evolves pentane and traces of the monomer.

Occupational - Exposure limit values(*)

Substance	Source	TWA	STEL / C	Notes
Styrene	ACGIH 2002	20 ppm	40 ppm	A4
Pentane	ACGIH 2002	600 ppm	---	
Hydrogen bromide	ACGIH 2002	---	3 ppm	Ceiling

Note: *Or statutory limit values in the country concerned.

Recommended monitoring procedures: As required by the rules and regulations of each country.

Biological

Adopted exposure biological indices

Substance (biological indices)	Source	Sampling time	B.E.I.	Note
Styrene (Urinary mandelic acid)	ACGIH 2002	End of shift	800 mg/g creatinine	Ns
		Prior to next shift	300 mg/g creatinine	Ns
Styrene (Ac. phenylglyoxylic)	ACGIH 2002	End of shift	240 mg/g creatinine	Ns
		Prior to next shift	100 mg/g creatinine	
Styrene in blood	ACGIH 2002	End of shift	0,55 mg/L	Sq
		Prior to next shift	0,02 mg/L	Sq

B = background; Nq = non-quantitative; Ns = non-specific; Sq = Semi-quantitative.

Recommended monitoring procedures: As required by the rules and regulations of each country.

8.2 Exposure control

Occupational exposure controls

Respiratory protection: An approved dust mask should be worn if dust is generated during processing or handling.



Hand protection:

- Type of glove material: suitable safety gloves.
- Breakthrough time of the glove material : refer to gloves producer's specifications.



Eye protection: Wear safety goggles.

Skin protection: Specific hygiene measures: standard issue work clothes. Safety shoes or boots.

Other :Wear suitable protective clothing. Antistatic safety shoes or antistatic boots.

Environmental exposure controls: EC and local provision on Volatile Organic Compounds (VOC), are to be fulfilled when they are applicable to the EPS industry.

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9 PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Solid
Form	Small spherical beads
Colour	White
Flash point:	<-50°C (Pentane)
Explosion limit-upper	7.8%(v/v) (Pentane)
Explosion limit-lower	1.3%(v/v) (Pentane)
Auto-ignition temperature	285°C (Pentane)
Density (beads)	1020-1050 kg/m ³ at 20°C
Vapour density (air=1)	2,5 (Pentane)
Solubility in water	Insoluble
Solubility in other solvents:	Soluble in aromatics, halogenated solvents and ketones.
Bulk density	circa 600 kg/m ³ at 20 °C
Softening point	70-75 °C (beads expand with evolution of pentane)
Partition coefficient n-octanol /water	Not Available

10 STABILITY AND REACTIVITY

- **Conditions to avoid:** Heat, flames and sparks. Strong direct sunlight for prolonged periods.
- **Materials to avoid:** Not Available
- **Hazardous decomposition products:**

Styrene monomer, carbon monoxide, hydrogen bromide (in case of fire or during hot wire cutting). Release rate of pentane increases with temperature. Beads expand with rapid evolution of pentane at 70-75°C. The product decomposes above 200°C.

11 TOXICOLOGICAL INFORMATION

Basis for assessment: Information given is based on knowledge of the ingredients and the toxicology of similar substances.

Dangerous health effects from exposure to the product: Effects of possible exposure to pentane. High exposure to pentane vapours can cause drowsiness and dizziness.

Symptoms: see section 4.

Information on different routes of exposure

Acute toxicity-oral: LD50 expected to be above 2000mg/kg

Acute toxicity-dermal: LD50 expected to be above 2000mg/kg

Acute toxicity-inhalation. LC50 expected to be >5mg/l

Eye irritation: May cause irritation

Skin irritation: May cause irritation

Skin sensitisation: Not a skin sensitiser

Inhalation: the product may cause user's exposure to pentane vapours.

Immediate, delayed and chronic effects from short and long-term exposure:



<http://www.monotez.com>
info@monotez.com

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None reported in the published literature for the product.

Sensitisation, Carcinogenicity, Mutagenicity, Reproductive toxicity:

None reported in the published literature for the product.

Narcosis: exposure to high pentane doses may cause narcosis.

12 ECOLOGICAL INFORMATION

Basis for assessment: Information given is based on knowledge of the ingredients and the toxicology of similar substances.

12.1 Ecotoxicity:

Air: When released to the air, pentane is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals, with half-life between 1 and 10 days.

Aquatic: This product contains a substance which is classified as dangerous for the environment. However recent studies on aquatic organisms have shown that EPS-beads, while containing this substance, do not need to be classified for environmental hazard.

When released into water, pentane may biodegrade to a moderate extent, and is expected to quickly evaporate, while is expected to have a half-life of less than 1 day. Pentane has an estimated bio concentration factor (BCF) of less than 100 and a log octanol-water partition coefficient greater than 3.0. Pentane is not expected to significantly bio accumulate.

Soil (micro- and macro-organisms): Not Available.

Inhibitory effects on the activity of micro-organisms and impact on sewage treatment plants: Not Available.

12.2 Mobility: Known or expected distribution to environmental compartments: Expandable polystyrene sinks in fresh water, may float or sink in sea water.

12.2 Degradability- Biodegradation: Not inherently biodegradable (polymer); readily biodegradable (pentane).

12.3 Bio accumulative potential: The product and its main components are not expected to bio accumulate. **Other adverse effects:**

Ozone depletion potential: pentane is not classified as an ozone depleting chemical.

Photochemical ozone creation potential, Global warming potential: N.A.

Sewage treatment: Practically non-toxic, EC50>100mg/l, to organisms in sewage treatment plants (estimated).

Other information: Small particles may have physical effects on aquatic and terrestrial organisms. Use according to good working practices and avoid environmental release.

13 DISPOSAL CONSIDERATIONS

Description and information on safe handling of surplus or waste

Surplus, unused, old beads may still contain residual pentane. Therefore it has to be treated using all the safety measures in place for the fresh material. Refer to Section 7 before handling the product or containers.

Appropriate methods of disposal of the product: Incineration, recycling, land filling:

Recover or recycle if possible. Otherwise incineration with residence time of 2 seconds above 1200°C, wet scrubbing facilities or licensed landfi ll.

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Appropriate methods of disposal of contaminated packaging: Refer to Section 7. Remove all packaging for recovery or waste disposal.

Relevant European Community provisions relating to waste: EC Directive 94/62.

National or regional provisions in force: Implementation of EU regulations and directives. Local provisions.

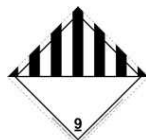
14 TRANSPORT INFORMATION

UN Number (sea, road, air transport): 2211

UN Class/Packing Group: 9/III

UN Proper Shipping Name: POLYMERIC BEADS, EXPANDABLE, evolving flammable vapor

IMO Class/Packing Group: 9/III



IMO Hazard Symbol: Miscellaneous dangerous substances and articles

IMO Marine Pollutant: No

IMO Proper Shipping name: POLYMERIC BEADS, EXPANDABLE, evolving flammable vapour

ADR/RID Class/Item: 9 / III

ADR/RID Hazard Symbol: Miscellaneous dangerous substances and articles

ADR/RID Kemler Number: 90/2211

ADR/RID Proper Shipping Name: POLYMERIC BEADS, EXPANDABLE, evolving flammable vapour

IATA/ICAO Class/Packing Group: 9/III

IATA/ICAO Hazard Symbol: Miscellaneous dangerous substances and articles

IATA/ICAO Proper shipping name: POLYMERIC BEADS, EXPANDABLE, evolving flammable vapour

Other information: Packages must be marked "Keep away from sources of ignition".

CEFIC TEC®: 90GM3-III

Special precautions:

Transport or conveyance within the production premises: refer to the internal procedure and to the information provided by this document (see section 7).

Transport or conveyance outside the production premises: Comply to the regulations of transport of dangerous goods and the producer's recommendation on safe loading, transporting, unloading of the material.

15 REGULATORY INFORMATION

Information on classification and labelling:

The product is classified according to EC Directive 1999/45 as R18 (see below), R52/53: "Harmful for aquatic organisms, may cause long term adverse effects in the aquatic environment". The product contains Pentane (see section 2) which is embedded in the polymer beads and is released



<http://www.monotez.com>
info@monotez.com

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very slowly by the product under advised handling and storage conditions. Therefore the product is not to be regarded as harmful for the environment in the form in which it is placed on the market (EC Directive 1999/45 of 03.05.1999, art. 12 paragraph 2).

REACH Regulation (EC) No 1907/2006.

This product contains Hexabromocyclododecane above 0,1% (w/w) listed in the Candidate list for Authorization established in accordance with article 59.1

Information shown on the label:

Designation or trade name : MONOCELL[®]- Expandable polystyrene beads flame retardant
Company responsible for placing the product on the EU market:

MONOTEZ S.A.

Address: 111 Lefkis str., 145 68 Kryoneri Attikis, Athens, Greece

Tel: (+302102811135)

Chemical name of the substance/s: EXPANDABLE POLYSTYRENE containing PENTANE

Hazard symbol/s : UN Class 9 miscellaneous hazard label

Indication/s of Hazard: UN Class 9 miscellaneous hazard label

Risk phrase/s (R) : R18 "In use, may form flammable/explosive vapour-air mixture"

Safety advice (S) : S3 "Keep in a cool place"

S7/9 "Keep container tightly closed, in a well ventilated place"

S16 "Keep away from sources of ignition – no smoking"

National Relevant Regulations: See national specific regulation.

16 OTHER INFORMATION

Information of importance for the health and safety of the user and the protection of the environment:

Directive 67/548/EC and Directive 1999/45/EC

R12: Extremely flammable.

R18: In use, may form flammable/explosive vapour-air mixture.

R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R65: Harmful: may cause lung damage if swallowed.

R66: Repeated exposure may cause skin dryness or cracking.

R67: Vapours may cause drowsiness and dizziness.

R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Regulation 1272/2008 (CLP)

H224: Extremely flammable liquid and vapor.

H304: May be fatal if swallowed and enters airways.

H336: May cause drowsiness or dizziness.

H361: Suspected of damaging fertility. Suspected of damaging the unborn child.

H362: May cause harm to breast-fed children.

H400: Very toxic to aquatic life.

H410: Very toxic to aquatic life with long lasting effects.

H411: Toxic to aquatic life with long lasting effects.

EUH066: Repeated exposure may cause skin dryness or cracking

Training advice:



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Suitable training on safety in handling, storing and converting the product should be given to the employees based on all the existing information.

Recommended restrictions on use:

The product is intended for professional use only.

Further information:

EINECS /ELINS(EC): *ingredients listed

MITI (Japan): * ingredients listed

TSCA (USA): * ingredients listed

AICS (Australia): * ingredients listed

DSL (Canada): * ingredients listed

[* subject to specific check]

Disclaimer: Information provided is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

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