



### 3. Composition / Information on ingredients

Product description Polystyrene (CAS No. 9003-53-6) / Polyphenylenoxide (CAS No. 25134-01-4), containing pentane isomers as blowing agent .

Hazardous ingredient(s)	CAS No.	% [w/w]	Hazard Symbol	Risk Phrases
Pentane (mixed isomers)	109-66-0 (78-78-4)	< 7	F+, Xn, N	R12, R51/53, R65, R66, R67
For full text of R phrases see section 16.				

### 4. First aid measures

Effects and Symptoms	May cause irritation to skin and eyes.
Inhalation	Remove persons affected by vapour to fresh air. If symptoms persist, obtain medical attention.
Ingestion	Unlikely to be hazardous if swallowed. Unlikely to be required but if necessary treat symptomatically.
Skin Contact	Wash skin with soap and water.
Eye Contact	Irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 15 minutes. If symptoms persist, obtain medical attention.
Further Medical Treatment	Unlikely to be required but if necessary treat symptomatically.

### 5. Fire fighting measures

General	Product is not classified as flammable, but will burn on contact with flame or exposure to high temperature (see Section 9). Flammable concentrations of pentane may accumulate on storage in closed containers. This product may give rise to hazardous fumes in a fire (Carbon monoxide, Carbon dioxide).
Extinguishing Media	Water spray, dry powder or carbon dioxide.
Unsuitable Extinguishing Media	Do not use water jet.
Fire Fighting Protective Equipment	A self contained breathing apparatus and suitable protective clothing should be worn in fire conditions.
Other	Keep fire exposed containers cool by spraying with water.

## 6. Accidental release measures

Caution - spillages may be slippery.

Pentane can form explosive mixture with air. The pentane vapour is heavier than air; beware of pits and confined spaces. Remove or make safe all sources of ignition. Avoid friction, sparks, or other means of ignition. Take precautionary measures against static discharges. Prevent entry into drains.

Methods for cleaning up

If safe to do so:

Small spillages: Sweep up and shovel into waste drums or plastic bags. Transfer to a lidded container for disposal or recovery.

Large spillages: Use vacuum equipment for collecting spilt materials, where practicable. Transfer to a lidded container for disposal or recovery.

Other

See also section 13.

## 7. Handling and storage

Handling

Provide adequate ventilation, including appropriate local extraction. Do not breathe fumes/vapour. Avoid generation of dust clouds. Should be kept away from naked flames and other sources of ignition. Extinguish any other fire. Remove or make safe all sources of ignition. Avoid friction, sparks, or other means of ignition. The electrical system should be spark-free.

When using do not smoke.

Take precautionary measures against static discharges. Ensure adequate earthing. Avoid release to the environment. Permission must be obtained from the appropriate Local Authority before disposing of waste material.

Process Hazards

Take precautionary measures against static discharges. To avoid the buildup of static electric charge, and also the formation of an explosive pentane-air mixture, containers should be fully emptied when processing. Ventilate freight containers for one hour before unloading.

Line velocity should not exceed 8m/s during normal pumping operations. All parts of the plant and equipment should be electrically bonded together and connected to earth. Electrical continuity should be checked at regular intervals. Antistatic clothing and footwear should be used.

Storage

Flammable concentrations of pentane may accumulate on storage in closed containers.

Keep container tightly closed, in a cool, well ventilated place.

Keep away from direct sunlight and other sources of heat or ignition. Keep away from rain and moist conditions.

Bulk: Keep under inert gas.

Open top tanks should be covered with an open rigid grid. Take precautionary measures against static discharges. The electrical system should be spark-free. The product is usually supplied in fibreboard octabins. It is recommended not to double stack octabins. Suitable containers: steel (drums).

Specific design for storage rooms or vessels

Storage rooms should be kept cool to reduce pentane release, and provided with a suitable ventilation system to prevent accumulation of pentane. In addition, safety devices to alert any build up of pentane/air explosive mixtures should be used. The electrical system should be spark-free. Equipment to be installed in potentially explosive atmospheres should conform to the requirements of ATEX Directive 94/9/ECI.

## 8. Exposure controls / personal protection

General	Use only in well-ventilated areas.
Respirators	An approved dust mask should be worn if dust is generated during processing or handling.
Eye Protection	Safety spectacles.
Gloves	Wear suitable gloves. Breakthrough time of the glove material: refer to the information provided by the gloves' producer.
Other	Wear suitable protective clothing. Antistatic safety shoes or antistatic boots.
Environmental Exposure Controls	European Community and local provisions on Volatile Organic Substances (VOC), are to be fulfilled when they are applicable to the EPS industry.

### OCCUPATIONAL EXPOSURE LIMITS

The following are limits for the expanding agent, during the conversion process (expansion) the preparation evolves pentane.

Substance	CAS No.	LTEL (8hr TWA ppm)	LTEL (8hr TWA mg/m <sup>3</sup> )	STEL (ppm)	STEL (mg/m <sup>3</sup> )	Note
Pentane (mixed isomers)	109-66-0 78-78-4	600	---	---	---	TLV (ACGIH)

## 9. Physical and chemical properties

Form	Solid, small spherical beads
Colour	White or dyed
Flash Point (°C)	< -50°C (Pentane)
Flammable Limits (Upper) (%v/v)	7.8% (v/v) (Pentane)
Flammable Limits (Lower) (%v/v)	1.3% (v/v) (Pentane)
Auto Ignition Temperature (°C)	285°C (Pentane) (ASTM E-659)
Density (g/ml)	1020–1050kg/m <sup>3</sup> @ 20°C (beads)
Bulk Density	circa. 600kg/m <sup>3</sup> @ 20°C
Vapour Density (Air=1)	2.5 (Pentane)
Partition Coefficient (n-Octanol/water):	Not available
Softening Point (°C)	80-85°C (beads expand with evolution of pentane)
Solubility (Water)	Insoluble
Solubility (Other)	Soluble in aromatic hydrocarbons, halogenated solvents and ketones.

## 10. Stability / reactivity

Conditions to avoid	Keep away from heat, sources of ignition and direct sunlight.
Materials to avoid	Avoid storing or handling in conjunction with UN Class 1 explosives.
Hazardous Decomposition Product(s)	Pentane, styrene monomer, carbon monoxide (in case of fire or during hot wire cutting). Release of pentane increases with temperature. (beads expand with evolution of pentane) @ 80-85°C

## 11. Toxicological information

This assessment is based on information available on similar products.

Inhalation	The product can evolve pentane vapours, which at high concentrations may lead to dizziness, headache and anaesthetic effects.
Ingestion	Unlikely to be hazardous if swallowed. LD50 > 2000 mg/kg
Skin Contact	May cause irritation. LD50 > 2000 mg/kg
Eye Contact	Irritating to eyes
Long Term Exposure	No data

## 12. Ecological information

This environmental hazard assessment is based on information available on similar products. Small particles may have physical effects on aquatic and terrestrial organisms.

### Environmental Fate and Distribution

The product is essentially insoluble in water. The product has low potential for bioaccumulation.

Bioconcentration factor (BCF): < 100

Expandable polystyrene sinks in fresh water, may float or sink in sea water.

### Persistence and Degradation

The product itself has not been tested. In accordance with the required stability the product is not readily biodegradable. The statement has been derived from the structure of the product. It can be largely eliminated from the water by abiotic processes, e.g. mechanical separation.

### Toxicity

Aquatic invertebrates:

EC50 (48 h) > 100 mg/l, *Daphnia magna* (OECD Guideline 202, part 1, static Nominal concentration). The product has low solubility in the test medium. An eluate has been tested. No toxic effects occur within the range of solubility.

Pentane has very low Global Warming Potential (<0.00044) and zero Ozone Depletion Potential.

### Effect on Effluent Treatment

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

## 13. Disposal considerations

Surplus, unused, old beads may still contain residual pentane. Therefore product has to be treated using all the safety measures in place for the fresh material. See Also Section 7.

### Regulatory information

European Union Directive 94/62/EC

### Recommended

Recover or recycle if possible. Remove all packaging for recovery or disposal. Normal disposal is via incineration operated by an accredited disposal contractor.

## 14. Transport information

UN No.	2211
UN Class	9
UN Pack. Group	III
Proper Shipping Name	POLYMERIC BEADS, EXPANDABLE, evolving flammable vapour (PENTANE)

Hazard Symbol



UN Class 9 miscellaneous hazard label

**Road/Rail**

ADR/RID Class	9
HAZARDS IDENTIFICATION	90
ADR Sin	2211
Tunnel restriction code	(D/E)
Special Provisions	633: Keep away from any source of ignition.

**SEA**

IMDG

: primary Class	9
UN Packing group Sea	III
Marine Pollutant	Not classified as a Marine Pollutant.
IMDG EMS	F-A, S-I

**AIR**

ICAO/IATA

: primary Class	9
UN Packing group Air	III

CEFIC TEC® 90GM3-III

Additional Information

Transport or conveyance within the manufacturing premises: Refer to the internal procedures and information provided by this document.

Transport or conveyance outside the manufacturing premises: Apply the requirements of the regulations on transport of dangerous goods and the manufacturer's recommendation on safe loading, transporting, unloading of the material.

### 15. Regulatory information

The preparation is classified according to EC Directive 1999/45 and following amendments as: R18: In use, may form flammable/explosive vapour-air mixture.

The preparation contains Pentane (see section 2) which is embedded in the polymer beads and is released very slowly by the preparation under advised handling and storage conditions. Therefore the preparation 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).

#### European Regulations

Trade name	Expandable polystyrene / Polyphenylenoxide as a polymer mixture
Company Identification	SUNPOR Kunststoff GmbH Stattersdorfer Hauptstraße 48 Österreich - 3100 St. Pölten
Telephone	++ 43 2742 291 0
FAX	++ 43 2742 291 40

#### Risk Phrases

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

#### Safety Phrases

S3/7: Keep container tightly closed in a cool place.  
S9: Keep container in a well-ventilated place.  
S16: Keep away from sources of ignition - No smoking.  
S33: Take precautionary measures against static discharges.

## 16. Other Information

### Risk Phrases

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.

### Training advice

Suitable information on safety in handling, storage and conversion of the product should be given to employees based on all the existing information. A DVD on EPS Fire Safety is available from Plastics Europe in 18 European languages. Please contact your EPS beads supplier for a copy.

### Additional Information

The following sections contain revisions or new statements:

2, 7, 8, 12, 15, 16

EINECS / ELINCS (EU): All components listed or polymer exempt.

Information contained in this publication is believed to be accurate and is given in good faith, but it is for the users to satisfy themselves of the suitability of the product for their own particular purpose.