

Safety data sheet**Section 1****Identification of the substance/preparation and the company/undertaking****1.1 Product identifier**

Material name	SUNDE Arctic EPS
Chemical name	Expandable polystyrene

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Raw material for production of expanded polystyrene. Expansion is typically carried out with steam. The expanded products are typically used for thermal insulation and packaging applications.
Uses advised against	Food contact applications.

1.3 Details of the supplier of the safety data sheet

Manufacturer	Brødr. Sunde as v/ Rolf Fagervoll Borgundfjordveien 118 6022 Ålesund Norway
Phone	+47 70 17 70 00
Fax number	+47 70 17 43 10
e-mail	norway@sundolitt.com
Web page	www.sundolitt.no
Responsible for the Safety Data Sheet	Lars Valentin e-mail: lars.valentin@sundolitt.com

1.4 Emergency telephone number

Emergency phone	+47 22 59 13 00
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Safety data sheet**Section 2****Hazards identification****2.1 Classification of the substance or mixture**

Regulation (EC) no 1272/2008	Not classified
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2.2 Label elements

hazard pictogram(s)	None	
signal word(s)	None	
hazard statement(s)	EUH 018	In use may form flammable/explosive vapour-air mixture.
precautionary statement(s)	P210	Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
	P233	Keep container tightly closed.
	P243	Take precautionary measures against static discharge.
	P403 + P235	Store in a well-ventilated place. Keep cool.

2.3 Other hazards

Other info	The product releases pentane, a flammable hydrocarbon. By use and storage flammable/explosive mixtures of pentane/air can be formed.
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Safety data sheet**Section 3****Composition/information on ingredients****3.1 Substances**

Not applicable

3.2 Mixtures

Formal name	Polystyrene (CAS no. 9003-53-6), containing pentane isomers as blowing agent and graphite.
Synonym	Expandable polystyrene, EPS

Chemical name	CAS no.	EC no.	Hazard pictogram(s)	Hazard statement(s)	Conc. W/W%
Polystyrene	9003-53-6	929-203-0	-	-	>88%
n-pentane	109-66-0	203-692-4	GSH02 - Flam. Liq. 2 GSH08 - Asp. Tox. 1 GSH07 - STOT SE 3 GSH09 - Aquatic Chronic 2	H225 H304 H336 H411	< 5.5%
iso-pentane	78-78-4	201-142-8	GSH02 - Flam. Liq. 1 GSH08 - Asp. Tox. 1 GSH07 - STOT SE 3 GSH09 - Aquatic Chronic 2	H224 H304 H336 H411	< 1.5%

For the classifications not written in full text in this section, the full text is listed in section 16.

Safety data sheet**Section 4****First aid measures****4.1 Description of first aid measures**

Inhalation	Move the exposed person to fresh air. Contact medical assistance if rapid improvement does not occur.
Skin contact	Wash skin with soap and water.
Eye contact	Rinse eyes with clean water. Contact medical assistance if rapid improvement does not occur.
Ingestion	Ensure air ways are free of obstruction and contact medical assistance.

4.2 Most important symptoms and effects, both acute and delayed

Inhalation	Headache, dizziness, coughing, narcosis.
Skin contact	Blushed and irritated skin.
Eye contact	Irritated eye.
Ingestion	Not known.

4.3 Indication of any immediate medical attention and special treatment needed

Unlikely to be required.

Safety data sheet**Section 5****Firefighting measures**

The product is not classified as flammable, but will burn in contact with flames or high temperatures.

5.1 Extinguishing media

Suitable extinguishing media	Foam, water spray, dry chemical powder, carbon dioxide. Sand or soil can be used for small fires only.
Unsuitable extinguishing media	Water in a jet.

5.2 Special hazards arising from the substance or mixture

The product may produce hazardous fumes in a fire. Decomposition products like; carbon dioxide (CO₂), soot, styrene, hydrocarbons and small amounts of carbon monoxide (CO). With a reduced supply of oxygen an increased amount of carbon monoxide will be produced.

5.3 Advice for firefighters

Full protective clothing and self-contained breathing apparatus.
The product releases pentane on heating. At temperatures above 70°C the product will expand with a subsequent increased release of pentane, pentane may form an explosive mixture in air. Material near the fire should, if possible, be removed or cooled with water.

Section 6**Accidental release measures****6.1 Personal precautions, protective equipment and emergency procedures**

Use gloves and safety goggles when handling.
Remove spills that can cause slippery surfaces - slip hazard.
Eliminate all ignition sources. Smoking prohibited. Ensure adequate ventilation. Avoid sparks, and take all feasible measures against static discharge.

6.2 Environmental precautions

Prevent the product from coming into the drains.

Safety data sheet

6.3 Methods and material for containment and cleaning up

Ensure good ventilation to prevent formation of explosive pentane / air mixture. Collect in an appropriate container e.g. with a shovel, for recycling or disposal.

6.4 Reference to other sections

See also section 8 and 13

Section 7

Handling and storage

7.1 Precautions for safe handling

Ensure that no open flames or other ignition sources are in the area where the product is handled.

Ensure adequate ventilation and avoid sparks.

Smoking prohibited.

Take precautionary measures against static electricity.

7.2 Conditions for safe storage, including any incompatibilities

Keep in dry and cool place, in closed containers. Keep away from direct sunlight and other heat or ignition sources. Storage temperature, preferably below 20°C.

7.3 Specific end use(s)

Raw material for production of expanded polystyrene products.

The expanded products are typically used for thermal insulation, packaging and protective material.

Safety data sheet**Section 8****Exposure controls/personal protection****8.1 Control parameters**

Component	OEL (Directive 1998/24/EC)
n-pentane CAS 109-66-0	1000 ppm = 3000 mg/m ³ (8 hour average)
iso-pentane CAS 78-78-4	1000 ppm = 3000 mg/m ³ (8 hour average)

Substance	EH40/2005 Workplace exposure limits (United Kingdom)
pentane CAS 109-66-0	600 ppm = 1800 mg/m ³ (8-hr TWA reference period)
isopentane CAS 78-78-4	600 ppm = 1800 mg/m ³ (8-hr TWA reference period)

8.2 Exposure controls**8.2.1 Appropriate engineering controls**

Good ventilation must be ensured where the product is stored and handled. Equipment for pre-expansion should have ventilation/exhaust systems that can ensure workers are not exposed to pentane / styrene, in higher concentrations than specified in the local regulations.

During pre-expansion, pentane corresponding to 1 - 2% by weight of the product is expected to be released.

Intermediate storage of expanded beads in silo must also take place in a well ventilated area. Depending on the storage time, it can be expected that the pentane released during silo storage, is around 0-3% by weight.

Moulding of products from pre-expanded beads must also take place under well ventilated conditions. It can be expected, during moulding, that released pentane is around 1 - 2% by weight.

The finished moulded product should be stored/handled in well ventilated areas, as the product may still contain 1 - 3% of pentane.

1-2 weeks after the conversion of the product for insulation, packaging or other. The residual pentane will, under normal conditions, be so low that there will no longer be risk of formation of explosive pentane/air atmosphere from the product.

Safety data sheet**8.2.2 Individual protection measures, such as personal protective equipment**

Eye/face protection	Safety goggles
Skin protection	Suitable gloves and clothing.
Respiratory protection	Normally not required under proper ventilation. In cases of inadequate ventilation use filter mask with filter type AX. Under inadequate ventilation makes sure that the pentane concentration is below the lower explosion limit and ignition sources are eliminated, before working in the area.
Thermal hazards	Not applicable

8.2.3 Environmental exposure controls

Local regulation on VOC emission has to be fulfilled if applicable for the EPS industry.

Section 9**Physical and chemical properties****9.1 Information on basic physical and chemical properties**

Appearance	Solid beads with diameter < 2.0 mm
Colour	Black
Odour	Weak odour, paraffinic
Odour threshold (ppm)	Not established
pH	Not applicable
Melting point/freezing point	Not established
Initial boiling point and boiling range	Not established
Flashpoint	> 70°C
Evaporation rate	Not established

Safety data sheet

Flammability	In use may form flammable/explosive vapour-air mixture
Upper/lower flammability or explosive limits	1,3 - 7,8 VOL% (pentane)
Vapour pressure	Not established
Vapour density	Not established
Relative density	2,5 (pentane)
Solubility(ies)	Soluble in some organic solvents, e.g. aromatic hydrocarbons, halogenated hydrocarbons and ketones. Insoluble in water.
Partition coefficient: n-octanol/water	Not established
Auto-ignition temperature	> 350°C
Decomposition temperature	Not established
Viscosity	Not established
Explosive properties	In use may form flammable/explosive vapour-air mixture
Oxidising properties	Not oxidising

9.2 Other information

Density	1025-1050 kg/m ³
Bulk density	550-650 kg/m ³
Softening point	60-70°C (beads start expansion)

Section 10**Stability and reactivity****10.1 Reactivity**

Stable when stored and handled according to recommendations.

Safety data sheet

10.2 Chemical stability

Stable when stored and handled according to recommendations.

10.3 Possibility of hazardous reactions

In use may form flammable/explosive vapour-air mixture

10.4 Conditions to avoid

Heat, flames, sparks and other sources of ignition. Avoid exposing the product to direct sunlight.

10.5 Incompatible materials

Avoid contact with organic solvents.

10.6 Hazardous decomposition products

By combustion and hot wire cutting, styrene, pentane, carbon dioxide, carbon monoxide and soot may be formed/released.

Safety data sheet**Section 11****Toxicological information**

The information is based primarily on the available experiment data for pentane. It is not based on trials conducted on the product itself.

11.1 Information on toxicological effects

Acute toxicity	LD50 (oral) >5000 mg/kg LC50 (inhalation) >20 mg/l High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea.
Skin corrosion/irritation	Not expected
Serious eye damage/irritation	Not expected
Respiratory or skin sensitisation	Not expected
Germ cell mutagenicity	No data available
Carcinogenicity	No data available
Reproductive toxicity	No data available
STOT-single exposure	No data available
STOT-repeated exposure	No data available
Aspiration hazard	No data available

Section 12**Ecological information**

Due to the low solubility of the product in water, the tests have been made on an eluate.

Safety data sheet**12.1 Toxicity**

Aquatic invertebrates	LC50 > 100 mg/litre Acartia tonsa (ISO 14669)
Algae/aquatic plants	EC50 > 100 mg/litre Skeletonema costatum (ISO 10253)

12.2 Persistence and degradability

Polystyrene is not inherently biodegradable

12.3 Bioaccumulative potential

Due to the polymeric structure the product is not bioaccumulative

12.4 Mobility in soil

The product is insoluble in water.

12.5 Results of PBT and vPvB assessment

Not classified as PBT or vPBT

12.6 Other adverse effects

Pentane has potential for creation of ground level ozone, POCP ca. 40 (ethylene = 100). In annex IV protocol 1979 pentane is placed in category "less important" for ground level ozone creation. Ozone creation speed in the atmosphere is relative slow, approx. 4 days half life. This means that even in the weakest wind conditions, pentane will be spread and diluted that much that no significant ground level ozone is formed, even from point sources.

Safety data sheet**Section 13****Disposal considerations****13.1 Waste treatment methods**

The product can release pentane and must be handled according to section 7.

Non-contaminated product can be recycled for material recovery.

Contaminated product can preferentially be incinerated for energy recovery or disposed in land fill. Only use professional operators and take into account local regulations when disposing.

Empty container completely, residues of the product can release pentane, that can form explosive mixtures with air.

Section 14**Transport information****14.1 UN number**

ADR	UN2211
RID	UN2211
IMDG	UN2211

14.2 UN proper shipping name

ADR	POLYMERIC BEADS, EXPANDABLE, evolving flammable vapour
RID	POLYMERIC BEADS, EXPANDABLE, evolving flammable vapour
IMDG	POLYMERIC BEADS, EXPANDABLE, evolving flammable vapour

14.3 Transport hazard class(es)

ADR	9
RID	9
IMDG	9

Safety data sheet**14.4 Packing group**

ADR	III
RID	III
IMDG	III

14.5 Environmental hazards

ADR	No
RID	No
IMDG	Not classified as marine pollutant

14.6 Special precautions for user

ADR	Can release flammable vapour, keep away from all sources of ignition. Use adequate ventilation of freight container before unloading. Tunnel restriction code: D/E
RID	Can release flammable vapour, keep away from all sources of ignition. Use adequate ventilation of freight container before unloading.
IMDG	Can release flammable vapour, keep away from all sources of ignition. Use adequate ventilation of freight container before unloading.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

Safety data sheet**Section 15****Regulatory information****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

Directive 94/62/EC on packaging and packaging waste.

15.2 Chemical safety assessment

Chemical safety assessment is not required for this product.

Section 16**Other information****Changes since last revision****List of hazard statements not written in full in section 2 and 3.**

hazard statement(s)	H224	Extremely flammable liquid and vapour.
	H225	Highly flammable liquid and vapour.
	H304	May be fatal if swallowed and enters airways.
	H336	May cause drowsiness or dizziness.
	H411	Toxic to aquatic life with long lasting effects.

Safety data sheet**Hazard pictograms not shown in section 2 and 3.**

Hazard pictogram(s)	GSH02 - Flam. Liq. 1	
	GSH02 - Flam. Liq. 2	
	GSH08 - Asp. Tox. 1	
	GSH07 - STOT SE 3	
	GSH09 - Aquatic Chronic 2	

Advice on training

It should be given training in safe handling and use of the product, based on the information in this document and the specific local conditions/regulations where the product is handled and used.

Disclaimer

This information is based on our current knowledge and experience. The Safety Data Sheet describes the product only with regard to health safety and environmental requirements. It should not be construed as a guarantee for specific product features.