

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), Annex II

1. SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1

| | |
|-------------------------------|--|
| Product identifier | |
| Product Name | Circulum® RE- grades (p/e) Expandable Polystyrene. |
| Chemical Name | Expandable Polystyrene (containing pentane expanding agent). |
| Synonyms | Recycled-EPS, expandable recycled polystyrene, expandable poly(fenylethene). |
| Trade name | Circulum® RE- grades (p/e) |
| CAS No. | None assigned. |
| EINECS No. | Polymer exempt. |
| REACH Registration No. | Polymer exempt. |

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

| | |
|-----------------------------|---|
| Identified use(s) | Used primarily for the manufacture of foamed thermal insulation and non food packaging. |
| Uses advised against | Food applications. |

1.3 Details of the supplier of the Safety Data Sheet

| | | |
|---------------------|------------------------------------|--------------------|
| Company name | BEWi Synbra RAW | |
| | Mailing adress NL | Mailing Adress FIN |
| | Postbus 37 | P.O. Box 360 |
| Postal code | 4870 AA | 06101 |
| City | Etten-Leur | Porvoo |
| Land | Nederland | Finland |
| E-mail | info@bewisynbra.com | |
| Website | http://www.bewisynbra.com/contact/ | |

1.4 Emergency telephone number

| | | |
|----------------------------|--|---|
| Emergency Phone No. | Poison information Centre (NVIC- NL) +31 (0) 30 274 88 88 (Only professional care providers) | Poison information Centre (FIN) +358 9 471977 |
| | +44 (0) 1865 407 333 (Only for transport emergencies) | |

2. SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

| | |
|--|----------------|
| Regulation (EC) No. 1272/2008 (CLP) | Not classified |
|--|----------------|

2.2 Label elements

| | |
|-----------------------------------|---|
| Product Name | Circulum® RE- grades (p/e) Expandable Polystyrene. |
| Hazard Pictogram | None. |
| Signal word(s) | None. |
| Hazard statement(s) | None. |
| Precautionary statement(s) | None |

P210: Keep away from heat, sparks, open flame, 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.

Supplementary Information

EUH018: In use may form flammable/explosive vapour-air mixture.

2.3 Other hazards

Product releases pentane, a flammable hydrocarbon.

May cause irritation to skin and eyes.

3. SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Polystyrene (CAS No. 9003536), containing pentane isomers as blowing agent.

| Hazardous ingredient(s) | %W/W | CAS No. | EC No. | REACH Registration No. | Hazard pictogram(s) and Hazard Codes |
|-------------------------|------|----------|-----------|------------------------|--|
| Iso pentane | <1,5 | 109-66-0 | 203-692-4 | 01-2119459286-30 | (iso-:GHS02, Flam. Liq. 1; H224), GHS08, Asp. Tox. 1; H304, GHS07, STOT SE 3; H336, GHS09, Aquatic Chronic 2; H411, |
| n-pentane | <4,5 | 78-78-4 | 201-142-8 | 01-2119475602-38 | (n-: GHS02, Flam. Liq. 2; H225), GHS08, Asp. Tox. 1; H304, GHS07, STOT SE 3; H336, GHS09, Aquatic Chronic 2; H411, |

For full text of H/P statements a see section 16.

4. SECTION 4: FIRST AID MEASURES



4.1 Description of first aid measures

| | |
|--------------|---|
| Inhalation | Remove persons affected by vapour to fresh air. If symptoms persist, obtain medical attention. |
| Skin Contact | Wash skin with soap and water. If symptoms persist, obtain medical attention. |
| Eye Contact | Irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 15 minutes. If symptoms persist, obtain medical attention. |
| Ingestion | Unlikely to be hazardous if swallowed. IF SWALLOWED: Do not induce vomiting. Obtain medical attention immediately if ingested. |

4.2 Most important symptoms and effects, both acute and delayed

Inhalation: Headache, Dizziness.

Eyes and Skin Contact: Redness, Irritation.

4.3 Indication of immediate medical attention and special treatment needed

Unlikely to be required but if necessary treat symptomatically.

5. SECTION 5: FIRE-FIGHTING MEASURES

Product is not classified as flammable, but will burn on contact with flame or exposure to high temperature (see Section 9).

5.1 Extinguishing Media

| | | |
|-----|---|--|
| | Suitable Extinguishing Media | Water spray, foam, dry powder or CO2. |
| | Unsuitable Extinguishing Media | Do not use water jet. |
| 5.2 | Special hazards arising from the substance or mixture | This product may give rise to hazardous fumes in a fire. Hazardous Decomposition Product(s): Carbon monoxide, Carbon dioxide, styrene, aliphatic hydrocarbons |
| 5.3 | Advice for fire-fighters | Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Chemical protection suit. Keep containers cool by spraying with water if exposed to fire. Flammable concentrations of pentane may accumulate on storage in closed containers. |

6. SECTION 6: ACCIDENTAL RELEASE MEASURES

| | | |
|-----|---|---|
| 6.1 | Personal precautions, protective equipment and emergency procedures | 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. Use only non-sparking tools. |
| 6.2 | Environmental precautions | Prevent entry into drains. |
| 6.3 | Methods and material for containment and 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 suitable for use in hazardous locations for collecting spilt materials, where practicable. Transfer to a lidded container for disposal or recovery. |
| 6.4 | Reference to other sections | See Also Section 8 and 13. |

7. SECTION 7: HANDLING AND STORAGE

| | | |
|-----|--|---|
| 7.1 | Precautions for safe 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. 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. |
| 7.2 | Conditions for safe storage, including any incompatibilities | Flammable concentrations of pentane may accumulate on storage in closed containers. Before unloading freight containers, keep doors open and ventilate for one hour. 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 or place them on storage racks without additional support under the pallet.

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.

Storage Temperature

Equipment to be installed in potentially explosive atmospheres should conform to the requirements of ATEX Directive 94/9/EC.

Ambient.

Incompatible materials

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

Suitable containers

Steel (drums).

7.3 Specific end use(s)

Used primarily for the manufacture of foamed thermal insulation and non food packaging.

8. SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational Exposure Limits

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

| SUBSTANCE | CAS No. | LTEL (8 hr TWA ppm) | LTEL (8 hr TWA mg/m³) | STEL (ppm) | STEL (mg/m³) | Note |
|-------------------------|----------|---------------------|-----------------------|------------|--------------|------|
| Pentane (mixed isomers) | 109-66-0 | 600 | 1800 | - | - | WEL |
| | 78-78-4 | | | | | |

WEL: Workplace Exposure Limit (UK HSE EH40)

8.1.2 Biological limit value

Not established.

8.1.3 PNECs and DNELs

Derived No Effect Levels (DNEL/DMEL)

| Derived No Effect Levels (DNEL/DMEL) | | | | |
|--------------------------------------|----------------|-----------------------------|------------------|-------------|
| Component | Exposure Route | Exposure Type (long/short) | Application area | Value |
| Pentane, iso- | Dermal | long term, systemic effects | Worker | 432 mg/kg/d |
| | Inhalation | long term, systemic effects | Worker | 3000 mg/m3 |
| | Dermal | long term, systemic effects | Consumer | 214 mg/kg/d |
| n-Pentane | Inhalation | long term, systemic effects | Consumer | 643 mg/m3 |
| | Oral | long term, systemic effects | Consumer | 214 mg/kg/d |
| | Dermal | long term, systemic effects | Worker | 432 mg/kg/d |
| | Inhalation | long term, systemic effects | Worker | 3000 mg/m3 |
| | Dermal | long term, systemic effects | Consumer | 214 mg/kg/d |
| | Inhalation | long term, systemic effects | Consumer | 643 mg/m3 |
| | Oral | long term, systemic effects | Consumer | 214 mg/kg/d |

| Predicted No Effect Concentration (PNEC) | | | |
|--|----------------|------------|-------------------------------------|
| Component | Exposure route | Value | Remark |
| Pentane, -iso | Water | 0,25 mg/l | fresh, marine, intermittent release |
| | Sediment | 1,10 mg/kg | |
| | Soil | 0,55 mg/kg | |
| | STP | 3,9 mg/l | |
| n-Pentane | Water | 0,23 mg/l | |
| | Sediment | 1,2 mg/kg | |
| | Soil | 0,55 mg/kg | |
| | STP | 3,6 mg/l | |

8.2 Exposure controls

8.2.1 Appropriate engineering controls Use only in well-ventilated areas.

8.2.2 Personal protection equipment

Eye/face protection Safety spectacles.



Skin protection (Hand protection/ Other)

Wear suitable gloves. Recommended: Impervious gloves (EN 374). Material NBR, thickness 0.5 mm, impermeable to solids. (eg Ribiflex S NB 27 S, penetration time:> 480 minutes). Wear suitable protective clothing. Anti-static safety shoes or boots type S1, S2 or S3 with PU sole or ESD shoes / boots.



Respiratory protection

An approved dust mask should be worn if dust is generated during handling.



Thermal hazards

Not applicable.

8.2.3 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.

9. SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

These properties are the most relevant.

9.1 Information on basic physical and chemical properties

| | |
|-----------------------|-------------------------------|
| Form | Solid, Small spherical beads. |
| Colour | RE: pale brown |
| Odour | Perceptible odour. |
| Odour Threshold (ppm) | Not established. |
| pH (Value) | Not applicable. |
| Melting Point (°C) | Not available. |
| Boiling Point (°C) | Not available. |
| Flash Point (°C) | < -50°C (Pentane). |

| | |
|---|---|
| Upper Explosive Limit (UEL) | 7.8% (v/v) (Pentane). |
| Lower Explosive Limit (LEL) | 1.3% (v/v) (Pentane). |
| Auto Ignition Temperature (°C) | 285°C (Pentane) (ASTM E-659). |
| Evaporation rate | Not available. |
| Flammability (solid, gas) | In use, may form flammable/explosive vapour-air mixture. |
| Vapour Pressure (mm Hg) | Not available. |
| Vapour Density (Air=1) | 2.5 (Pentane). |
| Density (g/ml) | 1020–1050kg/m ³ @ 20°C (beads). |
| Bulk Density (g/ml) | circa. 600kg/m ³ @ 20°C. |
| Softening Point (°C) | 70-75°C (beads expand with evolution of pentane). |
| Solubility (Water) | Insoluble. |
| Solubility (Other) | Soluble in aromatic hydrocarbons, halogenated solvents and ketones. |
| Partition Coefficient (n-Octanol/water) | Not available. |
| Decomposition Temperature (°C) | Not available. |
| Viscosity (mPa.s) | Not established. |
| Explosive properties | In use, may form flammable/explosive vapour-air mixture. |
| Oxidising properties | Not oxidising. |

9.2 Other information None.

10. SECTION 10: STABILITY AND REACTIVITY

| | | |
|------|------------------------------------|--|
| 10.1 | Reactivity | Stable under normal conditions. |
| 10.2 | Chemical stability | Stable under normal conditions. |
| 10.3 | Possibility of hazardous reactions | In use, may form flammable/explosive vapour-air mixture. |
| 10.4 | Conditions to avoid | Keep away from heat, sources of ignition and direct sunlight. |
| 10.5 | Incompatible materials | |
| 10.6 | 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) |

11. SECTION 11: TOXICOLOGICAL INFORMATION

This assessment is based on information available on similar products.

| | | |
|--------|--------------------------------------|--|
| 11.1 | Information on toxicological effects | |
| 11.1.1 | Polymer | |
| | Acute toxicity | |
| | Inhalation | The product can evolve pentane vapours, which at high concentrations may lead to dizziness, headache and anesthetic effects. |
| | Ingestion | Unlikely to be hazardous if swallowed. |
| | Skin Contact | No data. |
| | Eye Contact | No data. |
| | Irritation | May cause irritation to skin and eyes. |
| | Corrosivity | No data. |

| | |
|---------------------------|----------|
| Sensitisation | No data. |
| Repeated dose toxicity | No data. |
| Carcinogenicity | No data. |
| Mutagenicity | No data. |
| Toxicity for reproduction | No data. |

11.2 Other information None.

12. SECTION 12: ECOLOGICAL INFORMATION

This environmental hazard assessment is based on information available on similar products.

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.

| | | |
|------|------------------------------------|--|
| 12.1 | 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. Aquatic plants: EC50 (72 h) > 100 mg/l (growth rate), Desmodemus subspicatus (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. |
| 12.2 | Persistence and degradability | 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. |
| 12.3 | Bioaccumulative potential | The product has low potential for bioaccumulation. |
| 12.4 | Mobility in soil | The product is essentially insoluble in water. Expandable polystyrene sinks in fresh water, may float or sink in sea water. |
| 12.5 | Results of PBT and vPvB assessment | Not classified as PBT or vPvB. |
| 12.6 | Other adverse effects | Pentane has very low Global Warming Potential (<0.00044) and zero Ozone Depletion Potential. |

13. SECTION 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.

| | | |
|------|-------------------------|---|
| 13.1 | Waste treatment methods | Recover or recycle if possible. Remove all packaging for recovery or disposal. Normal disposal is via incineration operated by an accredited disposal contractor. |
| 13.2 | Additional Information | Dispose of contents in accordance with local, state or national legislation. |

14. SECTION 14: TRANSPORT INFORMATION

| | | |
|------|------------------------------|---|
| 14.1 | UN number | UN2211. |
| 14.2 | Proper Shipping Name | POLYMERIC BEADS, EXPANDABLE. |
| 14.3 | Transport hazard class(es) | 9. |
| 14.4 | Packing Group | III. |
| 14.5 | Environmental hazards | None. |
| 14.6 | Special precautions for user | 633: Keep away from any source of ignition. |

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.

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

14.8 Additional Information

Hazard Identification Number: 90.

Tunnel Restriction Code: D/E.

IMDG EMS: F-A, S-I.

Hazard label(s)

Sea transport (IMDG)

Air transport (ICAO/IATA)



UN Class 9 miscellaneous hazard label

15. SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1 EU regulations

Authorisations and/or restrictions on use

None known.

15.1.2 National regulations

Not applicable.

15.2 Chemical Safety Assessment

Not available.

16. SECTION 16: OTHER INFORMATION

This Safety Data Sheet was prepared in accordance with EC Regulation (EC) 1907/2006 (REACH), 1272/2008 (CLP) & 453/2010.

The following sections contain revisions or new statements: 1,2,3,8,14,16..

LEGEND

| | |
|------|---------------------------------------|
| LTEL | Long Term Exposure Limit |
| STEL | Short Term Exposure Limit |
| DNEL | Derived No Effect Level |
| PNEC | Predicted No Effect Concentration |
| PBT | Persistent, Bioaccumulative and Toxic |
| vPvB | very Persistent very Bioaccumulative |

Regulation (EC) No. 1272/2008 (CLP)

Hazard statement(s), Precautionary statement(s) and Hazard Codes

| | |
|--------------|---|
| H224 | Extremely 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. |
| EUH066 | Repeated exposure may cause skin dryness or cracking. |
| Flam. Liq. 1 | Flammable liquid Category 1 |

| | |
|-------------------|---|
| Asp. Tox. 1 | Aspiration hazard Category 1 |
| STOT SE 3 | Specific target organ toxicity — single exposure Category 3 |
| Aquatic Chronic 2 | Hazardous to the aquatic environment Chronic Category 2 |

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.

Information contained in this publication or as otherwise supplied to Users 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. BEWi Synbra RAW gives no warranty as to the fitness of the product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that exclusion is prevented by law. BEWi Synbra RAW accepts no liability for loss or damage (other than that arising from death or personal injury caused by defective product, if proved), resulting from reliance on this information. Freedom under Patents, Copyright and Designs cannot be assumed.

Annex to the extended Safety Data Sheet (eSDS) The exposure scenarios of the registered components are available on request.