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® GF-NF grades (p/e)
	Expandable Polystyrene.
Chemical Name	Expandable Polystyrene (containing pentane expanding agent).
Synonyms	FR-EPS, Flame Retardant Expandable polystyrene, poly(phenylethene).
Trade name	Circulum® GF-NF 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 packaging.
Uses advised against	None known.

1.3 Details of the supplier of the Safety Data Sheet

Company name	BEWI RAW	
	Mailing adress NL	Mailing Adress FIN
	Postbus 37	P.O. Box 360
Postal code	4870 AA	6101
City	Etten-Leur	Porvoo
Land	Nederland	Finland
E-mail	info@bewi.com	
Website	http://www.bewi.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® GF-NF 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 and a polymeric brominated flame retardant.

Hazardous ingredient(s)	%W/W	CAS No.	EC No.	REACH Registration No.	Hazard pictogram(s) and Hazard Codes
Iso pentane	<2	78-78-4	201-142-8	01-2119475602-38	(iso-:GHS02, Flam. Liq. 1; H224), GHS08, Asp. Tox. 1; H304, GHS07, STOT SE 3; H336, GHS09,Aquatic Chronic 2; H411, EUH066.
n-pentane	<5	109-66-0	203-692-4	01-2119459286-30	(n-: GHS02, Flam. Liq. 2; H225), GHS08, Asp. Tox. 1; H304, GHS07, STOT SE 3; H336, GHS09,Aquatic Chronic 2; H411, EUH066.

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 and traces of hydrogen bromide can be produced.
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 dust. 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. Do not eat, drink or smoke when using this product. 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.

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

Storage Temperature

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 packaging.

8. SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational Exposure Limits

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)				
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
	Inhalation	long term, systemic effects	Consumer	643 mg/m3
	Oral	long term, systemic effects	Consumer	214 mg/kg/d
n-Pentane	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 relase
	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

Use only in well-ventilated areas.

8.2.1 Appropriate engineering controls

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 0,50mm, impermeable for solids (e.g. Ribiflex S NB 27 S, breakthrough >480 min.) Antistatic shoes type S1, S2 of S3 with PU sole or ESD shoes/boots.

Wear suitable protective clothing.

Antistatic safety shoes or antistatic boots, type S1, S2 or S3 with PU sole or ESD 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	NF: white GF: grey
	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/m³ @ 20°C (beads)
	Bulk Density (g/ml)	circa. 600kg/m³ @ 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)	ca. 230oC
	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**	Keep away from heat, sources of ignition and direct sunlight.
10.4	**Conditions to avoid**	In use, may form flammable/explosive vapour-air mixture.
10.5	**Incompatible materials**	Avoid storing or handling in conjunction with UN Class 1 explosives.
10.6	**Hazardous Decomposition Product(s)**	Pentane, styrene monomer, carbon monoxide, hydrogen bromide. (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 anaesthetic 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 substances which are classified as dangerous for the environment. However recent studies on aquatic organisms have shown that EPS-beads, while containing these substances, 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 (48 h) > 100 mg/l, EC50 (72 h) > 100 mg/l (growth rate), Desmodesmus 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**	See Section: 15.1.1.
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. Waste code: the product itself: 07 02 13.
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. Not classified as a Marine Pollutant.
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	0
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
Repr. Cat 3	Toxicity for reproduction Category 3

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.
H361	Suspected of damaging fertility or 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.
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
Repr. 2	Reproductive toxicity Category 2
Aquatic Acute 1	Hazardous to the aquatic environment Acute Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment Chronic Category 1
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 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 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.