PENOX

ISO 9001
ISO 14001
ISO 50001
BUREAU VERITAS Certification

TECHNICAL DATASHEET

PE110

PE110 HCA*

Customer Recipe

Battery Additives

SLI, Engine Starting Expanders
PENOX PE110 & PE110HCA*

Main Battery Applications:

Engine starting for Automotive, Lawn and Garden Equipment, Recreational and Marine Vehicles.

Description:

PENOX Expander mixes are homogenous powder mixes of high purity raw materials which are added to the negative paste mix by the battery producer to improve the performance of the negative active material.

The selection of each single component of a PENOX Expander mix is intended to improve the lifetime performance of batteries. In addition to our standard grades we are able to produce tailor-made compositions upon customer's request.

PENOX Expander Mixes:

PE110 & PE110HCA*: recommended addition rate 1% of the lead oxide weight.
HCA*: *(designed for improved) **High **C**harge **A**cceptance*

Physical/Chemical Data:

Appearance: homogenous dry grey/black powder.

Ash content	
PE110	45-50%
PE110HCA	51-55%

Impurities, ICP	
Iron	< 50 ppm
Manganese	< 20 ppm
Copper	< 50 ppm
Nickel	< 5 ppm

All tests are carried out using DIN ISO methods.

Packaging:

In plastic bags, weight upon request depending on the negative paste mix recipe.

PENOX GmbH
Gothaer Str. 39
99885 Ohrdruf, Germany
www.penoxgroup.com

Version 2 - Jan 2017

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TECHNICAL DATASHEET

PE210

Advanced Battery Expanders
PENOX PE210

Main Battery Applications:

EFB, AGM and GEL batteries for automotive use (Stop-Start, Micro Hybrids).

Description:

PENOX Expander mixes are homogenous powder mixes of high purity raw materials which are added to the negative paste mix by the battery producer to improve the performance of the negative active material.

The selection of each single component of a PENOX Expander mix is intended to improve the lifetime performance of batteries. In addition to our standard grades we are able to produce tailor-made compositions upon customer's request.

Customer Recipe

PENOX Expander Mixes:

PE210: recommended addition rate 1% of the lead oxide weight.

Physical/Chemical Data:

Appearance: homogenous dry grey/black powder.

Ash content	
PE210	65 - 70%

Impurities, ICP	
Iron	< 50 ppm
Manganese	< 20 ppm
Copper	< 50 ppm
Nickel	< 5 ppm

All tests are carried out using DIN ISO methods.

Battery Additives

Packaging:

In plastic bags, weight upon request depending on the negative paste mix recipe.

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TECHNICAL DATASHEET

PE300

PE310

Customer Recipe

Battery Additives

Standby Power Expanders
PENOX PE300 & PE310

Main Battery Applications:

Telecom, Energy storage, Uninterruptible Power Supply (UPS), Submarines.

Description:

PENOX Expander mixes are homogenous powder mixes of high purity raw materials which are added to the negative paste mix by the battery producer to improve the performance of the negative active material.

The selection of each single component of a PENOX Expander mix is intended to improve the lifetime performance of batteries. In addition to our standard grades we are able to produce tailor-made compositions upon customer's request.

PENOX Expander Mixes:

PE300 & PE310: recommended addition rate 1% of the lead oxide weight.

Physical/Chemical Data:

Appearance: homogenous dry grey/black powder.

Ash content	
PE300	83-85%
PE310	78-80%

Impurities, ICP	
Iron	< 50 ppm
Manganese	< 20 ppm
Copper	< 50 ppm
Nickel	< 5 ppm

All tests are carried out using DIN ISO methods.

Packaging:

In plastic bags, weight upon request depending on the negative paste mix recipe.

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TECHNICAL DATASHEET

PE410

Customer Recipe

Battery Additives

Motive Power Expanders
PENOX PE410

Main Battery Applications:

Traction, Forklift, Golf cart, Mining vehicles.

Description:

PENOX Expander mixes are homogenous powder mixes of high purity raw materials which are added to the negative paste mix by the battery producer to improve the performance of the negative active material.

The selection of each single component of a PENOX Expander mix is intended to improve the lifetime performance of batteries. In addition to our standard grades we are able to produce tailor-made compositions upon customer's request.

PENOX Expander Mixes:

PE410: recommended addition rate 1% of the lead oxide weight.

Physical/Chemical Data:

Appearance: homogenous dry grey/black powder.

Ash content	
PE410	71-73%

Impurities, ICP	
Iron	< 50 ppm
Manganese	< 20 ppm
Copper	< 50 ppm
Nickel	< 5 ppm

All tests are carried out using DIN ISO methods.

Packaging:

In plastic bags, weight upon request depending on the negative paste mix recipe.

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EXPANDER MIXES FOR AUTOMOTIVE AND INDUSTRIAL BATTERIES

With modern battery design it is not enough to improve the positive active material performance only, it is quite clear that the negative active material also has to meet new requirements.

Since mid 2011 PENOX GmbH has been developing new types of Expander mix offering advantages in terms of current availability under different states of discharge and reducing the softening of negative active material (NAM) during use.

In combination with TBLS+® our Expander mixes can improve the lifetime performance of negative plates without any loss of cold cranking performance.

ADVANTAGES

- Formation of a porous (sponge-like) structure of the NAM during charging operations
- Adjustment of pore sizes to support acid exchange during high current charge situations
- Increase of service life due to stable crystalline/sponge structures during discharge/charge operations
- Low water consumption given by the use of pure materials

WHY USE PENOX EXPANDERS?

Reduced Expander quantity in the recipe:

- our selection of raw materials
- higher degree of homogeneity than standard "batch mixes"

Technical Performance:

- cold cranking and charge acceptance improvements, increased lifetime performance.

Service:

- addition of fibres to the Expander mix
- smaller trial batch sizes possible
- tailor-made Expander mixes
- local European production site (short delivery times, increased delivery reliability/security)

WHICH PENOX EXPANDER TYPE?

PENOX GmbH offers 6 standard types of Expander Mix

PE110	developed for Automotive standard SLI
PE110 HCA	premium Expander for High Charge Acceptance NEW
PE210	developed for Automotive EFB, AGM and Gel
PE300 & PE310	developed for Stationary Flooded and Gel
PE410	developed for Traction Flooded and Gel

Beside these standard types PENOX GmbH can produce tailor-made Expander Mixes that meet 100% of the customer requirements.

One bag for one paste batch for easy handling at the customer site.

DECREASE YOUR COST
INCREASE YOUR PERFORMANCE

SAVINGS WITH PENOX EXPANDERS

- **Reduced quantity of Expander per paste batch (only 1%)**
- More constant battery quality
- Reduction of labour/administrative costs
- Clean working environment or area
- Savings of time and transport cost
- Optimized homogeneity of the paste (no deviation coming from manual addition of single compounds)
- Technical support can be offered

DESCRIPTION

PENOX produces all Expander mixes using high performance raw materials only.

PENOX Expanders are homogenous mixes of powder materials which are used by battery producers to improve the performance of their negative active material. They are easily added to the paste mix, particularly when using our water-soluble bags.

Each single component of a PENOX Expander mix is of high purity to minimise water losses and to avoid any negative effects on the lifetime performance of the batteries.

INNOVATIONS

NEW PRODUCT DEVELOPMENT CENTRE

- Based in Germany
- State -of-the-art equipment
- Operational since mid 2017
- Development of functional additives for batteries
- Enhanced material testing

NEW PACKAGING SOLUTION

- Dust-free handling
- Bag completely dissolved in the paste mix
- Bags are water-soluble
- Battery performance is not affected by the bag material
- No more waste of bags
- All expander components are incorporated to the paste mix to 100%

TECHNICAL DATA

Type	Application	Ash Content %	Iron Content %
PE110 Automotive	SLI	45 - 50	< 0.05
PE110HCA Automotive		51 - 55	< 0.05
PE210 Automotive	AGM, EFB, Gel	65 - 70	< 0.05
PE300 Stationary	Flooded and Gel	83 - 85	< 0.05
PE310 Stationary		78 - 80	< 0.05
PE410 Traction		71 - 73	< 0.05

All tests are carried out using DIN ISO methods.

SAFETY DATA SHEET
Penox Expander

According to Regulation (EC) No 1907/2006, Annex II, as amended. Commission Regulation (EU) No 2015/830 of 28 May 2015.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name Penox Expander

Product number PE 1xx, PE 2xx, PE 3xx, PE 4xx, x=0..9

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

Identified uses Additive for the negative active mass of lead acid batteries.

Uses advised against No specific uses advised against are identified.

1.3. Details of the supplier of the safety data sheet

Supplier

PENOX GmbH
Gothaer Strasse 39
D-99885 Ohrdruf
Germany
+49-3624 37 180 (Ohrdruf Site)
+49-3624 37 18 25
info@penox.de

1.4. Emergency telephone number

Emergency telephone

+49 (0) 162 297 0072
+49 (0) 162 297 0078
+49 (0) 162 297 0071

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards Not Classified

Health hazards Not Classified

Environmental hazards Not Classified

2.2. Label elements

Hazard statements NC Not Classified

Precautionary statements

P260 Do not breathe dust.
P280 Wear protective gloves, eye and face protection.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P306+P360 IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.

2.3. Other hazards

This product does not contain any substances classified as PBT or vPvB.

Penox Expander

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Barium sulfate **40 - 90%**

CAS number: 7727-43-7 EC number: 231-784-4 REACH registration number: 01-2119491274-35-0001

Substance with National workplace exposure limits.

Classification
Not Classified

Sodium lignosulphonate **5 - 50%**

CAS number: 8061-51-6 EC number: 232-505-9

Classification
Not Classified

Carbon black **5 - 40%**

CAS number: 1333-86-4 EC number: 215-609-9 REACH registration number: 01-2119384822-32-XXXX

Substance with National workplace exposure limits.

Classification
Not Classified

Sodium carboxymethyl cellulose **0 - 5%**

CAS number: 9004-32-4

Classification
Not Classified

The full text for all hazard statements is displayed in Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

General information Remove contaminated clothing. If in doubt, get medical attention promptly. Show this Safety Data Sheet to the medical personnel.

Inhalation If throat irritation or coughing persists, proceed as follows. Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Get medical attention if any discomfort continues.

Ingestion If throat irritation or coughing persists, proceed as follows. Rinse mouth. Get medical attention if any discomfort continues.

Skin contact Rinse with water. Get medical attention if any discomfort continues.

Eye contact Remove any contact lenses and open eyelids wide apart. Rinse with water. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

Penox Expander

General information The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

Inhalation Frequent inhalation of dust over a long period of time increases the risk of developing lung diseases.

Ingestion No specific symptoms known. May cause discomfort if swallowed.

Skin contact Prolonged contact may cause dryness of the skin.

Eye contact No specific symptoms known. May be slightly irritating to eyes.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor Treat symptomatically.

Specific treatments No special treatment required.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Alcohol-resistant foam. Carbon dioxide (CO2). Powder. Water spray. Use fire-extinguishing media suitable for the surrounding fire.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards The product is classified as ST 1 according to VDI 2263, however, minimum ignition energies of 10,000 mJ or ignition temperatures of >400°C are necessary to cause a dust explosion in the first place. The product falls under fire class A: solids, primarily of organic nature, that usually form embers when burning.
The product contains substances which are insoluble in water and which may spread on water surfaces.

Hazardous combustion products Thermal decomposition or combustion products may include the following substances: Toxic gases or vapours. Irritating gases or vapours. Carbon monoxide (CO). Sulphur dioxide.

5.3. Advice for firefighters

Special protective equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid generation and spreading of dust. Take care as floors and other surfaces may become slippery. Provide adequate ventilation. Use suitable respiratory protection if ventilation is inadequate. For personal protection, see Section 8.

6.2. Environmental precautions

Environmental precautions Not regarded as dangerous for the environment. However, large or frequent spills may have hazardous effects on the environment. Avoid discharge into drains or watercourses or onto the ground.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Wear protective clothing as described in Section 8 of this safety data sheet. Clear up spills immediately and dispose of waste safely. Avoid generation and spreading of dust. Collect powder using special dust vacuum cleaner with particle filter or carefully sweep into suitable waste disposal containers and seal securely. Wash thoroughly after dealing with a spillage. For waste disposal, see Section 13.

Penox Expander

6.4. Reference to other sections

Reference to other sections For personal protection, see Section 8. See Section 11 for additional information on health hazards. See Section 12 for additional information on ecological hazards. For waste disposal, see Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Avoid handling which leads to dust formation. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Handle the substance carefully to minimise releases. Combustible Dust Dust may form explosive mixture with air. Do not breathe dust. Provide adequate ventilation. Take precautionary measures against static discharges. Container must be kept tightly closed when not in use.

Advice on general occupational hygiene Good personal hygiene procedures should be implemented. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Clean equipment and the work area every day. Remove contaminated clothing and protective equipment before entering eating areas.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Store away from incompatible materials (see Section 10). Store in a dry place. Keep cool. Keep container tightly closed. Keep away from food, drink and animal feeding stuffs.

7.3. Specific end use(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure controls/Personal protection

8.1. Control parameters

Occupational exposure limits

Barium sulfate

Long-term exposure limit (8-hour TWA): WEL 4 mg/m³ respirable dust
Long-term exposure limit (8-hour TWA): WEL 10 mg/m³ inhalable dust

Carbon black

Long-term exposure limit (8-hour TWA): WEL 3.5 mg/m³
Short-term exposure limit (15-minute): WEL 7 mg/m³
WEL = Workplace Exposure Limit

Barium sulfate (CAS: 7727-43-7)

DNEL Workers - Inhalation; Long term systemic effects: 10 mg/m³
General population - Inhalation; Long term systemic effects: 10 mg/m³
General population - Oral; Long term systemic effects: 13000 mg/kg/day

PNEC Fresh water; 115 µg/l
STP; 62.2 mg/l
Sediment (Freshwater); 600.4 mg/kg
Soil; 207.7 mg/kg

Carbon black (CAS: 1333-86-4)

DNEL Workers - Inhalation; Long term systemic effects, local effects: 0.5 mg/m³

Penox Expander

PNEC	Fresh water; 1 mg/l Fresh water, Intermittent release; 10 mg/l marine water; 0.1 mg/l marine water, Intermittent release; 1 mg/l

8.2. Exposure controls

Protective equipment

Appropriate engineering controls	Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation or other engineering controls as the primary means to minimise worker exposure. Personal protective equipment should only be used if worker exposure cannot be controlled adequately by the engineering control measures.
Eye/face protection	Dust-resistant, chemical splash goggles. Personal protective equipment for eye and face protection should comply with European Standard EN166.
Hand protection	Wear protective gloves made of the following material: Neoprene. Leather. To protect hands from chemicals, gloves should comply with European Standard EN374. Use appropriate skin cream to prevent drying of skin.
Other skin and body protection	Wear protective clothing. Change work clothing daily before leaving workplace. Contaminated work clothing should not be allowed out of the workplace.
Hygiene measures	Good personal hygiene procedures should be implemented. Do not eat, drink or smoke when using this product. Wash after use and before eating, smoking and using the toilet. Care should be taken to avoid contact with contaminants when removing contaminated clothing. Take off contaminated clothing and wash it before reuse. Clean equipment and the work area every day.
Respiratory protection	Respiratory protection complying with an approved standard should be worn if a risk assessment indicates inhalation of contaminants is possible. Wear a respirator fitted with the following cartridge: Particulate filter, type P2. / Particulate filter, type P3. Respirator selection must be based on exposure levels, the hazards of the product and the safe working limits of the selected respirator. Full face mask respirators with replaceable filter cartridges should comply with European Standard EN136. Half mask and quarter mask respirators with replaceable filter cartridges should comply with European Standard EN140. Disposable filtering half mask respirators should comply with European Standard EN149 or EN405. Check that the respirator fits tightly and the filter is changed regularly.
Environmental exposure controls	Not regarded as dangerous for the environment. Keep container tightly sealed when not in use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Powder.
Colour	Brown. Black.
Odour	Slight. Vanilla.
Odour threshold	Not available.
pH	pH (concentrated solution): 7 - 9
Melting point	Not available.

Penox Expander

Initial boiling point and range	Not available.
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	>500°C VDI 2263 (BAM Furnace) >315°C (Godberg Greenwald furnace)
Upper/lower flammability or explosive limits	Lower flammable/explosive limit: 0.03 g/m³ Upper flammable/explosive limit: 11,000 g/m³
Vapour pressure	Not available.
Vapour density	Not available.
Relative density	1.5 - 3.0 @ 20°C
Solubility(ies)	2 - 40 % water @ 20°C
Partition coefficient	Not available.
Burning rate	>45s
Auto-ignition temperature	> 300°C
Decomposition Temperature	> 240°C [CAS 9004-32-4]
Viscosity	Not applicable.
Explosion class (dust)	ST 1 (VDI 2263, EC 84/449)
Explosive properties	Not available.
Max. explosion pressure	10 bar (VDI 2263)
Oxidising properties	Does not meet the criteria for classification as oxidising.
Max. pressure rise	30-400bar/s (VDI 2263, ASTM E 1226-88)
Ignition power	>1kJ (VDI 2263)
Lowest ignition power	>10,000mJ (VDI 2263)

9.2. Other information

Particle size	0.5 - 15 µm

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	See the other subsections of this section for further details.

10.2. Chemical stability

Stability	Stable at normal ambient temperatures and when used as recommended.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	Under normal conditions of storage and use, no hazardous reactions will occur. The following materials may react with the product: Strong oxidising agents. May generate heat.

10.4. Conditions to avoid

Conditions to avoid	Keep away from heat, sparks and open flame. Avoid excessive heat for prolonged periods of time. >240°C

10.5. Incompatible materials

Penox Expander

Materials to avoid Avoid contact with the following materials: Strong oxidising agents. Flammable/combustible materials. Organic peroxides/hydroperoxides. Water-reactive materials.

10.6. Hazardous decomposition products

Hazardous decomposition products Does not decompose when used and stored as recommended. Thermal decomposition or combustion products may include the following substances: Carbon monoxide (CO). Carbon dioxide (CO2). Sulphur dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological effects Not regarded as a health hazard under current legislation.

Acute toxicity - oral

Notes (oral LD_{50}) Based on available data the classification criteria are not met.

Acute toxicity - dermal

Notes (dermal LD_{50}) Based on available data the classification criteria are not met.

Acute toxicity - inhalation

Notes (inhalation LC_{50}) Based on available data the classification criteria are not met.

Skin corrosion/irritation

Animal data Based on available data the classification criteria are not met.

Serious eye damage/irritation

Serious eye damage/irritation Based on available data the classification criteria are not met.

Respiratory sensitisation

Respiratory sensitisation There is no evidence that the product can cause respiratory hypersensitivity.

Skin sensitisation

Skin sensitisation Based on available data the classification criteria are not met.

Germ cell mutagenicity

Genotoxicity - in vitro Based on available data the classification criteria are not met.

Carcinogenicity

Carcinogenicity Based on available data the classification criteria are not met.

IARC carcinogenicity Contains a substance which may be potentially carcinogenic. IARC Group 2B Possibly carcinogenic to humans.

Reproductive toxicity

Reproductive toxicity - fertility Based on available data the classification criteria are not met.

Reproductive toxicity - development Based on available data the classification criteria are not met.

Specific target organ toxicity - single exposure

STOT - single exposure Not classified as a specific target organ toxicant after a single exposure.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure Not classified as a specific target organ toxicant after repeated exposure.

Aspiration hazard

Aspiration hazard Not relevant. Solid.

Penox Expander

General information	No specific health hazards known. The severity of the symptoms described will vary dependent on the concentration and the length of exposure.
Inhalation	Frequent inhalation of dust over a long period of time increases the risk of developing lung diseases.
Ingestion	No specific symptoms known. May cause discomfort if swallowed.
Skin contact	Prolonged contact may cause dryness of the skin.
Eye contact	No specific symptoms known. May be slightly irritating to eyes.
Route of exposure	Ingestion Inhalation Skin and/or eye contact
Target organs	No specific target organs known.

Toxicological information on ingredients.

Barium sulfate

Toxicological effects	Not regarded as a health hazard under current legislation.
Acute toxicity - oral	
Acute toxicity oral (LD_{50} mg/kg)	307,000.0
Species	Rat
Notes (oral LD_{50})	REACH dossier information.
ATE oral (mg/kg)	307,000.0
Skin corrosion/irritation	
Human skin model test	Cell Viability 80% 15 minutes REACH dossier information. Not irritating.
Serious eye damage/irritation	
Serious eye damage/irritation	Dose: 100 mg, 1 hour, Rabbit REACH dossier information. Not irritating.
Skin sensitisation	
Skin sensitisation	Local Lymph Node Assay (LLNA) - Mouse: Not sensitising. REACH dossier information. Read-across data.
Germ cell mutagenicity	
Genotoxicity - in vitro	Chromosome aberration: Negative. REACH dossier information. Read-across data.
Carcinogenicity	
Carcinogenicity	NOAEL 2500 ppm, Oral, Rat REACH dossier information. Read-across data.
Specific target organ toxicity - repeated exposure	
STOT - repeated exposure	NOAEL 2000 ppm, Oral, Rat REACH dossier information. Read-across data.

Sodium lignosulphonate

Toxicological effects	Not regarded as a health hazard under current legislation.

Carbon black

Acute toxicity - oral	
Notes (oral LD_{50})	LD_{50} > 10000 mg/kg, Oral, Rat REACH dossier information.

Penox Expander

Skin corrosion/irritation

Skin corrosion/irritation	Not irritating. Not corrosive to skin.
Animal data	Dose: 0.5 g, 24 hours, Rabbit Erythema/eschar score: No erythema (0). Oedema score: No oedema (0). Primary dermal irritation index: 0 REACH dossier information. Not irritating.

Serious eye damage/irritation

Serious eye damage/irritation	Dose: 100mg, 24 hours, Rabbit REACH dossier information. Not irritating.

Skin sensitisation

Skin sensitisation	Buehler test - Guinea pig: Not sensitising. REACH dossier information.

Germ cell mutagenicity

Genotoxicity - in vitro	Gene mutation: Negative. REACH dossier information.
Genotoxicity - in vivo	DNA damage and/or repair: Negative. REACH dossier information.

Carcinogenicity

Carcinogenicity	NOEL 10000 mg/kg, Oral, Mouse REACH dossier information.
IARC carcinogenicity	IARC Group 2B Possibly carcinogenic to humans.

Reproductive toxicity

Reproductive toxicity - development	No evidence of reproductive toxicity in animal studies.

Sodium carboxymethyl cellulose

Toxicological effects	Not regarded as a health hazard under current legislation.

Acute toxicity - oral

Notes (oral LD_{50})	LD_{50} 27000 mg/kg, Oral, Rat

SECTION 12: Ecological information

Ecotoxicity Not regarded as dangerous for the environment. However, large or frequent spills may have hazardous effects on the environment.

12.1. Toxicity

Toxicity The effects to environment coming from these compounds can be expected to be very low, due to their insolubility. Sodium lignosulphonate and Sodium methyl cellulose can be dissipated to 100% in the environment by forming substances that are not affecting the environment.

Ecological information on ingredients.

Barium sulfate

Toxicity	Aquatic toxicity is unlikely to occur. Based on available data the classification criteria are not met.

Acute aquatic toxicity

Acute toxicity - fish	LC_{50}, 96 hours: > 3.5 mg/l, Brachydanio rerio (Zebra Fish) REACH dossier information.

Penox Expander

Acute toxicity - aquatic invertebrates	LC_{50}, 48 hours: 14.5 mg/l, Daphnia magna REACH dossier information.
Acute toxicity - aquatic plants	EC_{50}, 72 hours: > 1.15 mg/l, Pseudokirchneriella subcapitata NOEC, 72 hours: ≥ 1.15 mg/l, Pseudokirchneriella subcapitata REACH dossier information.
Acute toxicity - microorganisms	EC_{50}, 3 hours: > 1000 mg/l, Activated sludge NOEC, 3 hours: ≥ 1000 mg/l, Activated sludge REACH dossier information.

Chronic aquatic toxicity

Chronic toxicity - fish early life stage	NOEC, 33 days: ≥ 100 mg/l, Brachydanio rerio (Zebra Fish) REACH dossier information.
Chronic toxicity - aquatic invertebrates	EC_{16}, 3 weeks: 5.8 mg/l, Daphnia magna REACH dossier information.

Sodium lignosulphonate

Toxicity	No negative effects on the aquatic environment are known.

Carbon black

Acute aquatic toxicity

Acute toxicity - fish	LC_0, 96 hours: 1000 mg/l, Brachydanio rerio (Zebra Fish)
Acute toxicity - aquatic invertebrates	EC_{50}, 24 hours: >5600 mg/l, Daphnia magna
Acute toxicity - aquatic plants	EC_{50}, 72 hours: >10000 mg/l, Desmodesmus subspicatus

Sodium carboxymethyl cellulose

Toxicity	No negative effects on the aquatic environment are known.

Acute aquatic toxicity

Acute toxicity - fish	LC_{50}, 96 hours: 100 mg/l, Oncorhynchus mykiss (Rainbow trout)
Acute toxicity - aquatic invertebrates	EC_{50}, 48 hours: 87.26 mg/l, Daphnia magna

12.2. Persistence and degradability

Persistence and degradability The product contains mainly inorganic substances which are not biodegradable. The other substances in the product are expected to be readily biodegradable.

Ecological information on ingredients.

Barium sulfate

Persistence and degradability	Not readily biodegradable.

Sodium lignosulphonate

Persistence and degradability	No data available.

Penox Expander

Carbon black

Persistence and degradability	Not readily biodegradable.
Biological oxygen demand	0 mg O_2/l
Chemical oxygen demand	2600 mg O_2/l

Sodium carboxymethyl cellulose

Persistence and degradability	No data available.

12.3. Bioaccumulative potential

Bioaccumulative potential Bioaccumulation is unlikely.

Partition coefficient Not available.

Ecological information on ingredients.

Barium sulfate

Bioaccumulative potential	BCF: 1.2 - 74.4, Lepomis macrochirus (Bluegill) REACH dossier information. Weight of evidence.

Sodium lignosulphonate

Bioaccumulative potential	No data available on bioaccumulation.

Carbon black

Bioaccumulative potential	No data available on bioaccumulation.

Sodium carboxymethyl cellulose

Bioaccumulative potential	No data available on bioaccumulation.

12.4. Mobility in soil

Mobility The product has poor water-solubility. Not considered mobile.

Ecological information on ingredients.

Barium sulfate

Mobility	Insoluble in water.

Sodium lignosulphonate

Mobility	No data available.

Carbon black

Mobility	Insoluble in water.

Sodium carboxymethyl cellulose

Mobility	No data available.

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12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

Ecological information on ingredients.

Barium sulfate

Results of PBT and vPvB assessment Substance is inorganic. Not relevant.

Sodium lignosulphonate

Results of PBT and vPvB assessment No data available.

Carbon black

Results of PBT and vPvB assessment Substance is inorganic. Not relevant.

Sodium carboxymethyl cellulose

Results of PBT and vPvB assessment No data available.

12.6. Other adverse effects

Other adverse effects None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information Dispose of waste product or used containers in accordance with local regulations

Disposal methods Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of the local water authority. Empty containers or liners may retain some product residues and hence be potentially hazardous.

Waste class 16 07 09*
Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

SECTION 14: Transport information

General The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

No transport warning sign required.

14.4. Packing group

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Not applicable.

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant
No.

14.6. Special precautions for user

Not applicable.

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

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

SECTION 15: Regulatory information

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

National regulations
Health and Safety at Work etc. Act 1974 (as amended).
The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (SI 2009 No. 1348) (as amended) ["CDG 2009"].
EH40/2005 Workplace exposure limits.

EU legislation
Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).
Commission Regulation (EU) No 2015/830 of 28 May 2015.
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).

15.2. Chemical safety assessment

No chemical safety assessment has been carried out.

SECTION 16: Other information

Abbreviations and acronyms used in the safety data sheet
CAS: Chemical Abstracts Service.
ATE: Acute Toxicity Estimate.
DMEL: Derived Minimal Effect Level.
IBC: International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (International Bulk Chemical Code).
LC_{50}: Lethal Concentration to 50 % of a test population.
LD_{50}: Lethal Dose to 50% of a test population (Median Lethal Dose).
MARPOL 73/78: International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978.
NOAEL: No Observed Adverse Effect Level.
NOEC: No Observed Effect Concentration.
PBT: Persistent, Bioaccumulative and Toxic substance.
PNEC: Predicted No Effect Concentration.
REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006.
vPvB: Very Persistent and Very Bioaccumulative.

Classification procedures according to Regulation (EC) 1272/2008
Not classified for physical hazards.: On basis of test data.
Not classified for health hazards.: Calculation method.
Not classified for environmental hazards.: Calculation method.

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