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

1.1. Product Identifier

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CALCIUM PEROXIDE MIXTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Name</td>
<td>PermeOx® Ultra</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Calcium Peroxide</td>
</tr>
<tr>
<td>CAS-No</td>
<td>1305-79-9</td>
</tr>
<tr>
<td>EC-No</td>
<td>215-39-4</td>
</tr>
</tbody>
</table>

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

Recommended Use: Environmental applications; For the remediation of contaminated groundwater

Restrictions on Use: No uses to be advised against were identified

1.3. Details of the supplier of the safety data sheet

Manufacturer/Supplier

| PeroxyChem LCC               |
| Only Representative: PeroxyChem Spain s.l.u. |
| C/ Afueras s/n 50784 La Zaida (Zaragoza) Spain |
| Tel: +34 976 179600           |

E-mail address

sdsinfo-emea@peroxychem.com

1.4. Emergency telephone numbers

La Zaida:
Tel: +34 976 17 96 00
Fax: +34 976 17 96 01
2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Regulation (EC) No 1272/2008

Classified as dangerous in accordance with Regulation (EC) No 1272/2008.

<table>
<thead>
<tr>
<th>Hazard Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Category 1</td>
</tr>
<tr>
<td>Specific target organ systemic toxicity (single exposure)</td>
<td>Category 3 Respiratory Irritant</td>
</tr>
<tr>
<td>Oxidizing Solids</td>
<td>Category 2</td>
</tr>
</tbody>
</table>

For the full text of the H- and EUH- phrases mentioned in this Section, see Section 16.

2.2. Label Elements

Signal word: DANGER

Hazard Statements:
- H272 - May intensify fire; oxidizer
- H318 - Causes serious eye damage
- H335 - May cause respiratory irritation

Precautionary statements:
- P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
- P221 - Take any precaution to avoid mixing with combustibles
- P280 - Wear protective gloves/protective clothing/eye protection/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
- P261 - Avoid breathing dust.

2.3. OTHER INFORMATION

General Hazards
Reacts with moisture to liberate oxygen
3. COMPOSITION/INFORMATION ON INGREDIENTS

| Substance/preparation | Multi-constituent substance |

<table>
<thead>
<tr>
<th>CALCIUM PEROXIDE MIXTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical name</td>
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<tr>
<td>Calcium Peroxide</td>
</tr>
<tr>
<td>Calcium Hydroxide</td>
</tr>
</tbody>
</table>

For the full text of the H- and EUH- phrases mentioned in this Section, see Section 16

4. FIRST AID MEASURES

4.1. Description of first-aid measures

Skin Contact  
Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye Contact  
Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids intermittently. Consult a physician.

Inhalation  
Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. If breathing difficulty or discomfort occurs and persists, obtain medical attention.

Ingestion  
Rinse mouth with water and afterwards drink plenty of water or milk. Do not induce vomiting or give anything by mouth to an unconscious person. Call a poison control center or doctor immediately for treatment advice. Never give anything by mouth to an unconscious person.

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

Most important symptoms and effects, both acute and delayed  
Corneal lesions and irreversible damage if contact with the eyes

4.3. Indication of immediate medical attention and special treatment needed, if necessary

Indication of immediate medical attention and special treatment needed, if necessary  
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media  
Flood with water

5.2. Special hazards arising from the substance or mixture

Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases  
Decomposes under fire conditions to release oxygen that intensifies the fire.

5.3. Advice for firefighters

Special protective equipment for fire-fighters  
As in any fire, wear self-contained breathing apparatus and full protective gear.
6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Avoid contact with the skin and the eyes. Avoid dust formation. Ensure adequate ventilation. For personal protection see Section 8.

6.2. Environmental Precautions

Local authorities should be advised if significant spillages cannot be contained. Try to prevent the material from entering drains or water courses.

6.3. Methods and materials for containment and cleaning up

Vacuum or shovel waste into a drum and label contents for disposal. Do not return product to the original storage container/tank due to risk of decomposition. Keep combustibles (wood, paper, oil, etc) away from spilled material. After cleaning, flush away traces with water Do not flush powdered material to sewer; Runoff to sewer may create fire or explosion hazard

6.4. Reference to other sections

See section 13 for disposal information.

7. HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Avoid contact with skin and eyes. Ensure adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment if release of airborne dust is expected. If compounded with organics or combustible materials be sure to exclude moisture.

7.2. Conditions for safe storage, including any incompatibilities

Storage
Keep tightly closed in a dry and cool place. Do not store near combustible materials. Keep away from heat and sources of ignition i.e., steam pipes, radiant heaters, hot air vents or welding sparks. Reacts with moisture. Keep container tightly closed.

Materials to avoid
Heavy metals. Combustible materials.

7.3. Specific end uses

Refer to Section 1 and the Annex.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure Limits
The product does not contain any hazardous materials with occupational exposure limits established for the EEC or its members

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>European Union</th>
<th>The United Kingdom</th>
<th>Ireland</th>
</tr>
</thead>
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<tr>
<td>Calcium Hydroxide 1305-62-0</td>
<td>TWA 5 mg/m³</td>
<td>STEL 15 mg/m³</td>
<td>TWA 5 mg/m³</td>
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<td>STEL 5 mg/m³</td>
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</tbody>
</table>
8.2. Exposure Controls

Engineering measures
Ensure adequate ventilation.

Personal protective equipment

General information
If the product is used in mixtures, it is recommended that you contact the appropriate protective equipment suppliers. These recommendations apply to the product as supplied.

Respiratory Protection
Use the indicated respiratory protection if the occupational exposure limit is exceeded and/or in case of product release (dust): Effective dust mask. The use of breathing apparatus must comply strictly with the manufacturer’s instructions and the regulations governing their choices and uses.

Eye/Face Protection
For dust, splash, mist or spray exposure, wear chemical protective goggles.

Skin and Body Protection
Long sleeved clothing. Chemical resistant apron. Rubber or plastic boots.

Hand Protection
Rubber/latex/neoprene or other suitable chemical resistant gloves. Wash the outside of gloves with soap and water prior to removal. Inspect regularly for leaks.

Hygiene measures
Clean water, preferably an eyewash station and a safety shower, should be available for washing in case of eye or skin contamination. Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls
The product should not be allowed to enter drains, water courses or the soil.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

| Appearance | Powder |
| Color      | White to off white |
| Physical State | Solid |
| Odor       | odorless |
| Odor threshold | Not applicable |
| pH         | 11.4 - 11.7 @ 25 °C |
| Flash point | Not flammable No information available |
| Melting Point/Range | Decomposes on heating @ ~275 °C |
| Freezing Point | No information available |
| Boiling Point/Range | No information available |
| Autoignition temperature | Product is not self-ignitable. |
| Explosive properties | Not explosive |
| Vapor pressure | No information available |
| Vapor density | No information available |
| Relative Density | ~ 2.92 |
9.2. OTHER INFORMATION

**Bulk Density**

45 34 lb/cu ft (loose) 72.8 (CaO2)

No information available

10. STABILITY AND REACTIVITY

10.1. Reactivity

None under normal use conditions

10.2. Chemical Stability

Stable under recommended storage conditions.

10.3. Possibility of Hazardous Reactions

Contamination, heat, and humid conditions will enhance and accelerate decomposition. However, unlike most oxidizers, decomposition is endothermic.

10.4. Conditions to avoid


10.5. incompatible materials

Heavy metals. Combustible materials.

10.6. Hazardous Decomposition Products

Oxygen which supports combustion. Calcium oxides

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

**Acute toxicity**

- **LD50 Dermal**: > 10 g/kg (rat)
- **LD50 Oral**: > 5 g/kg (rat)
- **LC50 Inhalation**: > 17 mg/L 1 hr (rat)

**Skin Contact**: Not irritating.

**Eye Contact**: Corrosive to the eyes and may cause severe damage including blindness.

**Inhalation**: Irritating to respiratory system.

**Chronic toxicity**

**Sensitization**: No information available.

**Carcinogenicity**: There are no known carcinogenic chemicals in this product.

**Mutagenicity**: This product is not recognized as mutagenic by Research Agencies

12. ECOLOGICAL INFORMATION
12.1. Toxicity

Ecotoxicity effects

The environmental impact of this product has not been fully investigated.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Toxicity to algae</th>
<th>Toxicity to fish</th>
<th>Toxicity to Microorganisms</th>
<th>Toxicity to daphnia and other aquatic invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium Hydroxide</td>
<td></td>
<td>96 h LC50: = 160 mg/L (Gambusia affinis) static</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

Biodegradability does not pertain to inorganic substances.

12.3. Bioaccumulative potential

Does not bioaccumulate.

12.4. Mobility in soil

No information available.

12.5. Results of PBT and vPvB assessment

PBT/vPvB assessment is not required for inorganic substances.

12.6. Other Adverse Effects

None known.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Product / Packaging disposal: Dispose of as hazardous waste in compliance with local and national regulations.

Contaminated Packaging: Empty remaining contents. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. TRANSPORT INFORMATION

ADR/RID

<table>
<thead>
<tr>
<th>UN/ID no</th>
<th>Proper Shipping Name</th>
<th>Hazard class</th>
<th>Packing Group</th>
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</thead>
<tbody>
<tr>
<td>UN 1457</td>
<td>CALCIUM PEROXIDE MIXTURE</td>
<td>5.1</td>
<td>II</td>
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IMDG/IMO

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ICAO/IATA

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<tr>
<td>1457</td>
<td>CALCIUM PEROXIDE MIXTURE</td>
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</tbody>
</table>
PermeOx® Ultra

Proper Shipping Name: CALCIUM PEROXIDE MIXTURE
Hazard class: 5.1
Packing Group: II

Transport Symbol

Environmental Hazards: This product contains no chemical substance that is listed as a marine pollutant according to DOT

Special Precautions for users: According to United Nations "Recommendations on the transport of dangerous goods"

Transport in bulk according to MARPOL 73/78 and the IBC Code: See IMDG above

15. REGULATORY INFORMATION

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

International Inventories

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>TSCA (United States)</th>
<th>DSL (Canada)</th>
<th>EINECS/ELINCS (Europe)</th>
<th>ENCS (Japan)</th>
<th>China (IECSC)</th>
<th>KECL (Korea)</th>
<th>PICCS (Philippines)</th>
<th>AICS (Australia)</th>
<th>NZIoC (New Zealand)</th>
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</thead>
<tbody>
<tr>
<td>Calcium Peroxide 1305-79-9</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Directive 2008/98/EC on waste
Applicable
CWC (Chemical Weapons Convention) - Annex on Chemicals
Not applicable
EU Export and import of dangerous chemicals (Regulation (EC) No 304/2003)
Not Applicable
Water contamination class (Germany):
No information available

15.2. Chemical Safety Report

A Chemical Safety Assessment has not yet been completed for this substance.

16. OTHER INFORMATION

Full text of H-phrases referred to in sections 2 and 3
H272 - May intensify fire; oxidizer
H318 - Causes serious eye damage
H335 - May cause respiratory irritation

Issuing Date: 2017-10-17

Restrictions on Use
This product's foreseen or recommended applications are: Environmental applications, For the remediation of contaminated groundwater

Revision date: 2018-01-31
Revision note: (M)SDS sections updated: 2, 11, 14

List of Abbreviations and Acronyms
ATE Acute Toxicity Estimate
ADR European Agreement concerning the International Carriage of Dangerous Goods by Road
AND European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
CE50 Concentración Efectiva Media
CEN European Committee for Standardisation
C&L Classification and Labelling
CLP Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
CLV Ceiling Limit Value Par CAS# Chemical Abstracts Service number
CMR Carcinogen, Mutagen, or Reproductive Toxicant
CSA Chemical Safety Assessment
CSR Chemical Safety Report
DNEL Derived No Effect Level
DOT Department of Transportation
DPD Dangerous Preparations Directive 1999/45/EC
DSD Dangerous Substances Directive 67/548/EEC
DU Downstream User
EC European Community
ECHA European Chemicals Agency
EC-Number EINECS and ELINCS Number (see also EINECS and ELINCS)
EEA European Economic Area (EU + Iceland, Liechtenstein and Norway)
EEC European Economic Community
EINECS European Inventory of Existing Commercial Substances
ELINCS European List of notified Chemical Substances
EN European Standard
EQS Environmental Quality Standard
EU European Union
Euphrac European Phrase Catalogue EWC
European Waste Catalogue (replaced by LoW –see below)FDS Ficha de Datos de Seguridad
GES Generic Exposure Scenario
GESGSI Globally Harmonized System
IATA International Air Transport Association
ICAO-TI Technical Instructions for the Safe Transport of Dangerous Goods by Air
IMDG International Maritime Dangerous Goods
IMO International Maritime Organization
IMSBC International Maritime Solid Bulk Cargoes
IT Information Technology
IUCLID International Uniform Chemical Information Database
IUPAC International Union for Pure Applied Chemistry
JRC Joint Research Centre
Kow octanol-water partition coefficient
LC50 Lethal Concentration to 50 % of a test population Lethal Dose to 50% of a test population (Median Lethal Dose)
LE Legal Entity
LLV Level Limit Value
LoW List of Wastes (see http://ec.europa.eu/environment/waste/framework/list.htm)
LR Lead RegistrantM/I Manufacturer / Importer MS Member States
MSDS Material Safety Data Sheet
NOEC No observed effect concentration
OC Operational Conditions
OECD Organization for Economic Co-operation and Development
OEL Occupational Exposure Limit
OJ Official Journal
OR Only Representative
OSHA European Agency for Safety and Health at work
PBT Persistent, Bioaccumulative and Toxic substance
PEC Predicted Effect ConcentrationPNEC(s) Predicted No Effect Concentration(s)
PPE Personal Protection Equipment(Q)SAR Qualitative Structure Activity Relationship
RID Regulations concerning the International Carriage of Dangerous Goods by Rail
RIP REACH Implementation Project
RMM Risk Management Measure
SCBA Self-Contained Breathing Apparatus
SDS Safety data sheet
PermeOx® Ultra

SIEF Substance Information Exchange Forum
SME Small and Medium sized Enterprises
STEL Short-term exposure limit
STOT Specific Target Organ Toxicity (STOT)
RE Repeated Exposure(STOT)
SE Single Exposure Par SVHC Substances of Very High Concern
TSCA Toxic Substances Control Act
TWA Time Weighed Average
UN United Nations
vPvB Very Persistent and Very Bioaccumulative / mPmB Muy Persistente y Muy Bioacumulativo
WGK Wassergefährdungsklassen

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Prepared By:

PeroxyChem
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End of Safety Data Sheet