

Material Safety Data Sheet

WPB 584L

| | |
|---------------------|---|
| HEALTH | 3 |
| FLAMMABILITY | 0 |
| PHYSICAL HAZARD | 1 |
| PERSONAL PROTECTION | |

1. Product and Company Identification

| | |
|---------------------------------|---|
| Material name | WPB 584L |
| Patent Number | Not available |
| Revision date | March-15-2011 |
| Version No. | 12 |
| CAS # | Mixture |
| Product use | pH control |
| Manufacturer information | WEATHERFORD INTERNATIONAL ENG.CHEM. 4420 SOUTH FLORES RD ELMENDORF, TX 78112 US Product Safety 210-626-0850 Chemtrec 800-424-9300 |
| Emergency | Chemtrec 800-424-9300 |
| Supplier information | Weatherford Fracturing Technologies 515 Post Oak Blvd Suite 1000 Houston, TX 77027 US |

2. Hazards Identification

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|---------------------------------|--|
| Emergency overview | DANGER -- CORROSIVE Causes severe skin and eye burns. Harmful if swallowed. Irritating to eyes and skin. Prolonged exposure may cause chronic effects. Avoid prolonged contact with eyes, skin and clothing. Components of the product may be absorbed into the body by inhalation, ingestion and through the skin. This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. |
| OSHA regulatory status | This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication). |
| Potential health effects | |
| Routes of exposure | Ingestion. Skin contact. Eye contact. Inhalation. |
| Eyes | This product causes eye burns. Risk of serious damage to eyes. Do not get this material in contact with eyes. |
| Skin | Causes skin burns. Do not get this material in contact with skin. |
| Inhalation | Causes burns. Prolonged inhalation may be harmful. Irritating to respiratory system. Do not breathe dust/fume/gas/mist/vapors/spray. |
| Ingestion | Harmful if swallowed. Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract. May cause delayed lung damage. Do not ingest. Components of the product may be absorbed into the body by ingestion. |
| Target organs | Eyes. Lungs. Respiratory system. Skin. |

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| Chronic effects | Shortness of breath. May cause delayed lung damage. |
| Signs and symptoms | Discomfort in the chest. Shortness of breath. Cough. |
| Potential environmental effects | Components of this product are hazardous to aquatic life. May cause long-term adverse effects in the environment. |

3. Composition / Information on Ingredients

| Components | CAS # | Percent |
|---------------------|-----------|---------|
| Potassium Carbonate | 584-08-7 | 30 - 60 |
| Potassium Hydroxide | 1310-58-3 | 15 - 40 |

4. First Aid Measures

First aid procedures

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| Eye contact | Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately. |
| Skin contact | Immediately flush skin with plenty of water. Remove and isolate contaminated clothing and shoes. Get medical attention immediately. For minor skin contact, avoid spreading material on unaffected skin. Wash clothing separately before reuse. |
| Inhalation | Move to fresh air. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention immediately. |
| Ingestion | If swallowed, seek medical advice immediately and show this container or label. Have victim rinse mouth thoroughly with water. Do not induce vomiting without medical advice. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Never give anything by mouth to a victim who is unconscious or is having convulsions. |

Notes to physician In case of shortness of breath, give oxygen. Keep victim warm. Symptoms may be delayed.

General advice In case of shortness of breath, give oxygen. Keep victim warm. Call a physician if symptoms develop or persist. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

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| Flammable properties | Not a fire hazard. The product is not flammable. |
| Extinguishing media | |
| Suitable extinguishing media | Water. Dry chemical, CO ₂ , water spray or regular foam. |
| Protection of firefighters | |
| Protective equipment and precautions for firefighters | Use water spray to cool unopened containers. Cool containers with flooding quantities of water until well after fire is out. |

6. Accidental Release Measures

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| Personal precautions | Local authorities should be advised if significant spillages cannot be contained. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering. Keep unnecessary personnel away. Stay upwind. Keep out of low areas. |
| Environmental precautions | Prevent further leakage or spillage if safe to do so. Do not contaminate water. |
| Methods for containment | Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Prevent entry into waterways, sewers, basements or confined areas. |
| Methods for cleaning up | Should not be released into the environment. Large Spills: Dike far ahead of liquid spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. After removal flush contaminated area thoroughly with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean contaminated surface thoroughly. Never return spills in original containers for re-use. |

7. Handling and Storage

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| Handling | Keep cool. Protect from frost, heat and sunlight. Do not breathe vapors or spray mist. Use only with adequate ventilation. Wash hands after handling and before eating. Do not get this material in contact with eyes. Do not get this material in contact with skin. Avoid release to the environment. Handle and open container with care. Do not get this material on clothing. Wash thoroughly after handling. Avoid prolonged exposure. |
| Storage | Do not store near acids. Keep container tightly closed. Store in cool place. Keep in a well-ventilated place. Keep this material away from food, drink and animal feed. Keep out of the reach of children. Use care in handling/storage. Store away from strong oxidizers. |

8. Exposure Controls / Personal Protection

Exposure limits

ACGIH

Components

| Components | CAS # | TWA | STEL | Ceiling |
|---------------------|-----------|-----------------|-----------------|---------------------|
| Potassium Hydroxide | 1310-58-3 | Not established | Not established | 2 mg/m ³ |

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|--------------------------------------|---|
| Engineering controls | Ensure adequate ventilation, especially in confined areas. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower nearby. |
| Personal protective equipment | |
| Eye / face protection | Do not get this material in contact with eyes. Wear safety glasses with side shields (or goggles) and a face shield. |
| Skin protection | Do not get this material in contact with skin. Do not get this material on clothing. Where splashing is possible, full chemically resistant protective clothing (e.g. acid suit) and boots are required. Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Protective gloves. Impervious gloves. |

Respiratory protection

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Use a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.

General hygiene considerations

Do not get this material in contact with eyes. Do not get this material in contact with skin. Do not get this material on clothing. When using do not eat or drink. Keep away from food and drink. Handle in accordance with good industrial hygiene and safety practice. Wash hands after handling and before eating.

9. Physical & Chemical Properties

| | |
|---|------------------------------------|
| Appearance | Clear |
| Color | Colorless. |
| Odor | Characteristic. |
| Odor threshold | Not available |
| Physical state | Liquid. |
| Form | Liquid. |
| pH | > 14 (as is @25 C) |
| Melting point | Not available |
| Freezing point | 9 °F (-12.8 °C) |
| Boiling point | Not available |
| Flash point | Not available |
| Evaporation rate | Not available |
| Flammability | Not available. |
| Flammability limits in air, upper, % by volume | Not available |
| Flammability limits in air, lower, % by volume | Not available |
| Vapor pressure | Not available |
| Vapor density | Not available |
| Specific gravity | 1.44 - 1.49 |
| Relative density | 1.4649 g/cm ³ estimated |
| Solubility (water) | Not available |
| Partition coefficient (n-octanol/water) | Not available |
| Auto-ignition temperature | Not available |
| Decomposition temperature | Not available |
| VOC | 14.5 % estimated |

10. Chemical Stability & Reactivity Information

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| Chemical stability | Stable at normal conditions. |
| Conditions to avoid | High temperatures. Heating can release hazardous gases. |
| Incompatible materials | Strong acids. Powerful oxidizers. Water. Isocyanates. Alcohols. Acids. Maleic anhydride. Glycol. Phenol. Cresol. Caustics. |
| Hazardous decomposition products | May include oxides of carbon. |

Possibility of hazardous reactions Hazardous polymerization does not occur.

11. Toxicological Information

Acute effects Acute LD50: 1175 mg/kg estimated, Rat, Oral
Causes burns.

Component analysis - LD50

Toxicology Data - Selected LD50s and LC50s

| | | |
|---------------------|-----------|--|
| Potassium Carbonate | 584-08-7 | Oral LD50 Rat: 1870 mg/kg; Dermal LD50 Rat: 1.87 mg/kg |
| Potassium Hydroxide | 1310-58-3 | Oral LD50 Rat: 214 mg/kg |

Local effects Irritating to respiratory system. Contact may irritate or burn eyes. Contact with skin may cause irritation.

Chronic effects Hazardous by OSHA criteria. Prolonged exposure may cause chronic effects.

Carcinogenicity Not expected to be hazardous by OSHA criteria.

Neurological effects Not expected to be hazardous by OSHA criteria.

12. Ecological Information

Ecotoxicity Components of this product are hazardous to aquatic life.

Ecotoxicity - Freshwater Fish Species Data

| | | |
|---------------------|-----------|--|
| Potassium Hydroxide | 1310-58-3 | 24 Hr LC50 Gambusia affinis: 80.0 mg/L |
|---------------------|-----------|--|

Environmental effects Harmful to aquatic life.

Ecotoxicity - Freshwater Fish Species Data

| | | |
|---------------------|-----------|--|
| Potassium Hydroxide | 1310-58-3 | 24 Hr LC50 Gambusia affinis: 80.0 mg/L |
|---------------------|-----------|--|

13. Disposal Considerations

Waste codes D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]

Disposal instructions Dispose of this material and its container at hazardous or special waste collection point. Do not allow this material to drain into sewers/water supplies. Incinerate the material under controlled conditions in an approved incinerator. Dispose in accordance with all applicable regulations.

14. Transport Information

Department of Transportation (DOT) Requirements

Basic shipping requirements:

Proper shipping name Corrosive liquid, basic, inorganic, n.o.s. (POTASSIUM HYDROXIDE, POTASSIUM CARBONATE)

Hazard class 8

UN number UN3266

Packing group II

Additional information:

Special provisions B2, IB2, T11, TP2, TP27

Packaging exceptions 154

Packaging non bulk 202

Packaging bulk 242

ERG number 154



Department of Transportation (DOT) Requirements

Bulk

Basic shipping requirements:

| | |
|--------------------------------|---|
| Proper shipping name | Corrosive liquid, basic, inorganic, n.o.s. (POTASSIUM HYDROXIDE, POTASSIUM CARBONATE) |
| Hazard class | 8 |
| UN number | UN3266 |
| Packing group | II |
| Additional information: | |
| Special provisions | B2, IB2, T11, TP2, TP27 |
| Packaging exceptions | 154 |
| Packaging non bulk | 202 |
| Packaging bulk | 242 |
| ERG number | 154 |



Canadian Transportation of Dangerous Goods (TDG) Requirements

Basic shipping requirements:

| | |
|--------------------------------|---|
| Proper shipping name | CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. (POTASSIUM HYDROXIDE, POTASSIUM CARBONATE) |
| Hazard class | 8 |
| UN number | UN3266 |
| Packing group | II |
| Additional information: | |
| Special provisions | 16 |
| ERG number | 154 |



IMDG

Basic shipping requirements:

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|-----------------------------|---|
| Proper shipping name | CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. (POTASSIUM HYDROXIDE, POTASSIUM CARBONATE) |
| Hazard class | 8 |
| UN number | 3266 |
| Packing group | II |



IATA

Basic shipping requirements:

| | |
|-----------------------------|---|
| Proper shipping name | Corrosive liquid, basic, inorganic, n.o.s. (POTASSIUM HYDROXIDE, POTASSIUM CARBONATE) |
| Hazard class | 8 |
| UN number | 3266 |
| Packing group | II |



15. Regulatory Information

Labelling

Contains Potassium Carbonate, Potassium Hydroxide

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

U.S. - FDA - Direct Food Additives

Potassium Carbonate 584-08-7 21 CFR 173.310

U.S. - FDA - Food Additives Generally Recognized as Safe (GRAS)

Potassium Carbonate 584-08-7 21 CFR 184.1619

Potassium Hydroxide 1310-58-3 21 CFR 184.1631

Occupational Safety and Health Administration (OSHA)

29 CFR 1910.1200 hazardous chemical Yes

CERCLA (Superfund) reportable quantity

Potassium Hydroxide: 1000.0000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
 Immediate Hazard - Yes
 Delayed Hazard - Yes
 Fire Hazard - No
 Pressure Hazard - No
 Reactivity Hazard - No

Section 302 extremely hazardous substance No

Section 311 hazardous chemical Yes

Inventory status

| Country(s) or region | Inventory name | On inventory (yes/no)* |
|-----------------------------|---|------------------------|
| Australia | Australian Inventory of Chemical Substances (AICS) | Yes |
| Canada | Domestic Substances List (DSL) | Yes |
| Canada | Non-Domestic Substances List (NDSL) | No |
| China | Inventory of Existing Chemical Substances in China (IECSC) | Yes |
| Europe | European Inventory of New and Existing Chemicals (EINECS) | Yes |
| Europe | European List of Notified Chemical Substances (ELINCS) | No |
| Japan | Inventory of Existing and New Chemical Substances (ENCS) | Yes |
| Korea | Existing Chemicals List (ECL) | Yes |
| New Zealand | New Zealand Inventory | Yes |
| Philippines | Philippine Inventory of Chemicals and Chemical Substances (PICCS) | Yes |
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | Yes |

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

International regulations
Canada - WHMIS - Ingredient Disclosure List

Potassium Carbonate 584-08-7 1 %
 Potassium Hydroxide 1310-58-3 1 %



State regulations

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

U.S. - Massachusetts - Right To Know List

Potassium Hydroxide 1310-58-3 Present

U.S. - Minnesota - Hazardous Substance List

Potassium Hydroxide 1310-58-3 Present

U.S. - New Jersey - Right to Know Hazardous Substance List

Potassium Hydroxide 1310-58-3 sn 1571

U.S. - Pennsylvania - RTK (Right to Know) List

Potassium Hydroxide 1310-58-3 Environmental hazard

U.S. - Rhode Island - Hazardous Substance List

Potassium Hydroxide 1310-58-3 Toxic; Flammable

U.S. - Texas - Effects Screening Levels - Long Term

Potassium Carbonate 584-08-7 5 µg/m3 ESL

Potassium Hydroxide 1310-58-3 2 µg/m3 ESL

U.S. - Texas - Effects Screening Levels - Short Term

Potassium Carbonate 584-08-7 50 µg/m3 ESL

Potassium Hydroxide 1310-58-3 20 µg/m3 ESL

16. Other Information**HMIS® ratings**

Health: 3
Flammability: 0
Physical hazard: 1

NFPA ratings

Health: 3
Flammability: 0
Instability: 1

Prepared by

Product Stewardship
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Disclaimer

THIS PRODUCT'S HEALTH AND SAFETY INFORMATION IS PROVIDED TO ASSIST OUR CUSTOMERS IN ASSESSING COMPLIANCE WITH HEALTH, SAFETY AND ENVIRONMENTAL REGULATIONS. THE INFORMATION CONTAINED HEREIN IS BASED ON DATA AVAILABLE TO US, AND IS BELIEVED TO BE ACCURATE, ALTHOUGH NO GUARANTEE OR WARRANTY IS PROVIDED OR IMPLIED BY THE COMPANY IN THIS RESPECT. SINCE THE USE OF THIS PRODUCT IS WITHIN THE EXCLUSIVE CONTROL OF THE USER, IT IS THE USER'S RESPONSIBILITY TO DETERMINE THE CONDITIONS OF SAFE USE. SUCH CONDITIONS MUST COMPLY WITH ALL GOVERNMENTAL REGULATIONS.

Issue date

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MSDS sections updated

Product and Company Identification: Alternate Trade Names