SAFETY DATA SHEET
Potassium Hydroxide, Liquid 45-50%

Revision date: 2020-06-15
Version: 1.0

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Identifier

Product Name: Potassium Hydroxide, Liquid 45-50%

Synonyms: Potassium Hydroxide, Potash, Liquid Potash, Caustic Potash, KOH

Product Form: Liquid

1.2 Recommended use of the chemical and restrictions on use

Recommended Use: Professional use, Industrial use. Chemical manufacturing, fertilizer, batteries, soaps
Restrictions on Use: Use as recommended by the label

1.3 Details of the supplier and of the safety data sheet

Supplier
Tersus Environmental, LLC
1116 Colonial Club Rd
Wake Forest, NC 27587
Phone: +1-919-453-5577
Email: info@tersusenv.com

1.4 Emergency telephone number

For leak, fire, spill or accident emergencies, call:

+1-919-453-5577 (Tersus Office Hours, 8:00 AM to 5:00 PM Eastern)
+1-919-638-7892 (Tersus Outside office hours)
+1-800-424-9300 (Chemtrec 24 Hour Service – Emergency Only)

2. HAZARD IDENTIFICATION

Relevant identified uses of the substance or mixture
GHS Classification in accordance with 29 CFR 1910 (OSHA HCS) GHS label elements, including precautionary statements:

Signal Word: Danger

Pictogram(s):


GHS05


GHS07

Hazard statement
H290 May be corrosive to metals.
H302 Harmful if swallowed.

H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage.
H402	Harmful to aquatic life.

Precautionary statement

P234	Keep only in original container.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink, or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/eye protection/face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse SKIN with water/ shower.
P305 + P361+ P338 +P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.
P304 + P340 + P310	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
P363	Wash contaminated clothing before reuse.
P390	Absorb spillage to prevent material damage.
P405	Store locked up.
P406	Store in corrosive resistant stainless-steel container with a resistant inner liner.
P501	Dispose of contents/container in accordance with local/state/national regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance; solution

Chemical Formula: KOH

CAS No: 1309-42-8

Mixture

Chemical Name	CAS Number	Concentration (wt. %)	GHS-US classification
Potassium hydroxide	1310-58-3	45 to 50	Acute Tox. 4 (Oral), H302 Skin Corr. 1A, H314 Aquatic Acute 3, H402
Water	7732-18-5	Balance	Not classified

Synonyms are provided in Section 1.
Occupational exposure limits, if available, are listed in Section 8.

4. FIRST AID MEASURES

General Information	Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance.
Eye Contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.
Skin Contact	Immediately take off all contaminated clothing. Wash off IMMEDIATELY with plenty of water for at least 15-20 minutes. Get medical attention. Wash clothing separately before reuse. Destroy or thoroughly clean contaminated shoes.
Inhalation	If breathed in, move person into fresh air. If breathing is difficult, give humidified air. Give oxygen but only by a certified physician. If breathing stops, provide artificial respiration. Get medical attention immediately.
Ingestion	Never give anything by mouth to an unconscious person. Rinse mouth with water. Give plenty of water to drink. Consult a physician.
Most important symptoms and effects, both acute and delayed	Toxic if swallowed. Harmful in contact with skin. Causes severe skin irritation. Symptoms may include redness, blistering, pain and swelling. Causes serious eye damage. Symptoms may include severe pain, blurred vision, redness, and corrosive damage. May cause respiratory irritation. Symptoms may include coughing, choking, and wheezing. Could result in pulmonary edema (fluid accumulation). Symptoms of pulmonary edema (chest pain, shortness of breath) may be delayed. Ingestion may cause severe burns to the mucous membranes of the digestive tract. Symptoms may include abdominal pain, vomiting, burns, perforations and bleeding.
Indication of any immediate medical attention and special treatment needed	Immediate medical attention is required. Causes chemical burns. Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Flash Point	None
Suitable Extinguishing Media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Auto Ignition Temp	Non-combustible
Special Fire Fighting Procedures	Wear self-contained breathing apparatus and full protective clothing. In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. Use water spray to cool unopened containers.
Unusual Fire/Explosion Hazards	Not combustible, however the product can react with metals such as aluminum, tin, zinc to form flammable and explosive hydrogen gas.
Fire-Fighting Measures	Potassium hydroxide does not burn or support combustion. Use extinguishing agents compatible with potassium hydroxide and appropriate for the surrounding fire. If water is used, care should be taken, since it can generate heat and cause spattering if applied directly to potassium hydroxide.

6. ACCIDENTAL RELEASE MEASURES

For emergency responders	Wear protective clothing as described in Section 8 of this safety data sheet. Contact with walking surface may result in formation of slippery film/falling hazard.
Environmental Precautions	Do not discharge into drains, water courses or onto the ground.
Methods for Containment and Clean Up	Cleanup personnel must wear proper protective equipment. Completely contain spilled material with dikes, sandbags, etc., and prevent run-off into ground or surface waters or sewers. Recover as much material as possible into containers for disposal. Remaining material may be neutralized with dilute hydrochloric or acetic acid. Neutralization products, both liquid and solid, must be recovered for disposal.
Special spill response procedures	If a spill/release more than the EPA reportable quantity is made into the environment, immediately notify the national response center in the United States (phone: 1-800-424-8802). US CERCLA Reportable quantity (RQ): Potassium hydroxide (1,000 lbs. / 454 kg)
Waste Control Procedures	All disposals of this material must be done in accordance with federal, state, and local regulations. Waste characterization and compliance with disposal regulations are the responsibilities of the waste generator.
Reference to other sections	See Section 1 for emergency contact information. See Section 8 for information on appropriate personal protective equipment. See Section 13 for additional waste treatment information.

7. HANDLING AND STORAGE

Precautions for safe handling	Storage tanks should be contained in a diked area that has sufficient capacity to hold the contents of the tank. This area should be free of potential contact with acids, organics, and reactive metals. Keep container tightly closed. Store in a cool, dry, well-ventilated place. Store in corrosive resistant container with a resistant inner liner. Store away from incompatible materials. Store at temperatures not exceeding 40°C/104°F. Compatible storage materials may include, but not be limited to, the following: nickel and nickel alloys, steel, plastics, plastic or rubber-lined steel, FRP, or Derakane vinyl ester resin. Do not allow material to freeze.
Conditions for safe storage	Store in a well-ventilated place. Keep container tightly closed. Store locked up. Keep away from incompatibles. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. Do not freeze. Store in corrosion-resistant containers. Avoid contact with aluminum.
Incompatible materials	Acids; Water; Metals (e.g., tin, aluminum, zinc, and alloys containing these metals)

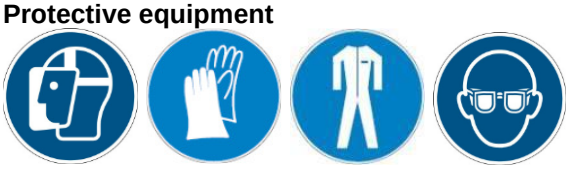
8. EXPOSRE CONTROL / PERSONAL PROTECTION

Principal Component: Potassium hydroxide, water
Occupational Exposure Limits:
Regulatory Limits:

Component	ACGIH TLV	OSHA PEL	15 Minute STEL	NIOSH IDLH
Inhalable Particulat	2 mg/m3 (ceiling	---	---	---

Control parameters
Exposure Control

Protective equipment



Appropriate engineering controls
Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Eye/face protection
The following protection should be worn: Chemical splash goggles and face shield.

Respiratory protection
Respiratory protection is required if the concentrations exceed the TLV. NIOSH-approved respirators are recommended. A self-contained breathing apparatus should be used in emergency situations or instances where exposure levels are not known. Seek advice from respiratory protection specialists. Respirators should be selected based on the form and concentration of contaminants in air, and in accordance with OSHA (29 CFR 1910.134) or CSA Z94.4-02.

Hand protection
Impervious gloves must be worn when using this product. Advice should be sought from glove suppliers. Wear as appropriate: Neoprene; Polyvinylchloride; Viton; Butyl rubber; Nitrile rubber; Polyethylene. Unsuitable material: polyvinyl alcohol.

Other skin and body protection
Wear chemically protective gloves (impervious), boots, aprons, and gauntlets to prevent prolonged or repeated skin contact.

Other protective equipment
An eyewash station and safety shower should be made available in the immediate working area. Other equipment may be required depending on workplace standards.

Hygiene measures
Do not breathe fumes or mists. Do not ingest. Avoid contact with skin, eyes, and clothing. Do not eat, drink, smoke or use cosmetics while working with this product. Upon completion of work, wash hands before eating, drinking, smoking or use of toilet facilities. Remove soiled clothing and wash it thoroughly before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Colorless, viscous liquid.
Odor	No odor
Odor Threshold	Not available
pH	>14
Boiling point	45% KOH Solution: 132.2°C (270°F) 50% KOH Solution: 143.3°C (290°F)
Flash point	No data available
Flammability	Not flammable
Upper/lower flammability or explosive limits	Not flammable
Explosive properties	Not flammable
Autoignition Temperature	No data available
Water solubility	100%
Physical State	Liquid at room temperature
Decomposition Temperature	No data available
Molecular Weight	56.1
Freeze/Solidification	45% KOH Solution: -28.8°C (-20°F) 50% KOH Solution: 8.9°C (48°F)
Specific Gravity (water = 1)	45% KOH Solution: 1.457 at 15.6°C (60°F) 50% KOH Solution: 1.516 at 15.6°C (60°F)
Density Liquid (pounds per gallon)	45% KOH Solution:12.2 lbs./gal 50% KOH Solution:12.5 lbs./gal
Vapor Density	No data available
Vapor Pressure	45% KOH Solution: 39mm Hg at 140°F (60°C) 50% KOH Solution: 27 mm Hg at 140°F (60°C)
Partition Coefficient: n-octanol/water	No data available

10. STABILITY AND REACTIVITY

Reactivity	Not normally reactive. May be corrosive to metals. Contact with most metals will generate flammable hydrogen gas. Contact with water will generate considerable heat.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Avoid heat and open flame. Keep away from incompatibles. Keep container tightly closed when not in use. Avoid contact with water.
Incompatible materials	Acids; Water; Metals (e.g. tin, aluminum, zinc and alloys containing these metals); Halogenated compounds; Nitrogen compounds.
Hazardous decomposition products	Flammable hydrogen gas may be generated when KOH and certain metals react.
Hazardous Polymerization	Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure:

Skin Contact: Major potential hazard - contact with the skin can cause severe burns with deep ulcerations. Contact with solution or mist can cause multiple burns with temporary loss of hair at burn site. Solutions may not cause immediate pain or irritation upon skin contact. Prolonged or repeated contact with dilute solutions may cause drying and cracking of skin and possible skin damage.
Skin Absorption: It can penetrate to deeper layers of skin and corrosion will continue until removed. The severity of injury depends on the concentration and the duration of exposure.

Eye Contact: Major potential hazard – Liquid in the eye can cause severe destruction and blindness. These effects can occur rapidly affecting all parts of the eye. Mist or dust can cause irritation with high concentrations causing destructive burns.

Inhalation: By analogy with sodium hydroxide, inhalation of solution mist is expected to cause mild irritation at 2 mg/m^3. More severe burns and tissue damage in the upper respiratory tract can occur at higher concentrations. Pneumonitis can result from severe exposures.

Ingestion: Ingestion of potassium hydroxide can cause severe burning and pain in lips, mouth, tongue, throat, and stomach. Severe scarring of the throat can occur after swallowing. Death can result from ingestion.

Information on toxicological effects:

Irritancy:	A study with a 10% solution showed severe tissue damage when applied to skin for 4 hours.
Sensitization:	Not available
Carcinogenicity:	One study was identified relative to potassium hydroxide and carcinogenicity. Mice painted with a 3 to 6% aqueous potassium hydroxide solution for 46 weeks developed skin tumors. This study was conducted in 1925 and the adequacy of the test and its design are unknown. No conclusions can be drawn from this study Potassium hydroxide is not listed on the IARC, OSHA or NTP carcinogen lists.
Teratogenicity & Mutagenicity:	Not available
Reproductive Toxicology:	Not available
Toxicological Synergism:	Not available

Product Species Test Results:

LD_{50}: there are several different numbers published:
- 205 mg/kg (rat oral) (1975)
- 365 mg/kg (rat oral) (1975)
- 273 mg/kg (male rat oral) (1987)
- 273 mg/kg (rat oral) (1996)

LC_{50}: Fresh water mosquito fish: 80.0 mg/L (24 Hours, static)

12. ECOLOGICAL INFORMATION

Ecological Information:

Persistence and degradability:	No data is available on the degradability of this product.
Bioaccumulative potential:	No data available for this product.
Mobility in soil:	Not available.
Other adverse effects:	No other adverse environmental effects (e.g. ozone

depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

Aquatic Toxicity: May cause shifts in water pH outside the range of pH 5 - 10. This change may be toxic to aquatic organisms.

Biodegradability: Not biodegradable (Biodegradability term pertains to an organic material capable of decomposition because of attack by microorganisms). However, potassium hydroxide will be neutralized by acidity present in natural environment.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods Collect and reclaim or dispose in sealed containers at licensed waste disposal site if possible. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways, or ditches with chemical or used container. Dispose in accordance with all applicable federal, state, provincial and local regulations. Empty containers or liners may retain some product residues.

RCRA If this product, as supplied, becomes a waste in the United States, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. It is the responsibility of the waste generator to determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state, and federal environmental agencies.

14. TRANSPORTATION INFORMATION

Shipping:

Usual Shipping Containers:	Tank car, Tank truck, ABS Drums.
Usual Shelf Life:	Sealed containers, years.
Storage/Transport Temperatures:	Ambient.

Suitable Storage:

Materials/Coatings:	Steel, plastic, polyethylene (when dry).
Unsuitable:	Aluminum or galvanized containers.

U.S. (D.O.T.)

Proper Shipping Name:	Potassium hydroxide, solution
Hazard Class:	8 - Class 8 - Corrosive material 49 CFR 173.136
Packing group	II - Medium Danger
UN/NA:	UN1814
Reportable Quantity (RQ):	1000 lbs. (100% basis)
Marine pollutant:	No
Poison Inhalation Hazard:	No
Labels:	8 - Corrosive

DOT Packaging Non-Bulk (49 CFR 173.xxx): 202

DOT Packaging Bulk (49 CFR 173.xxx): 242

DOT Special Provisions (49 CFR 172.102): B2 - MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306 and DOT 406 cargo tanks are not authorized.
IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized.
T7 - 4 178.274(d)(2) Normal..... 178.275(d)(3)
TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees Celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively.

DOT Packaging Exceptions (49 CFR 173.xxx): 154

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27): 1 L

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75): 30 L

DOT Vessel Stowage Location: A - The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel.

DOT Vessel Stowage Other: 52 - Stow ‘‘separated from’’ acids

Other information: No supplementary information available.

15. REGULATORY INFORMATION

SARA 302 Components
SARA 302: Not listed.

SARA 313 Components
SARA 313: Not regulated.

SARA 311/312 Hazards
EPCRA reporting quantities: TQ:10,000 pounds (100% KOH basis).

Massachusetts Right to Know Components

Potassium Hydroxide	CAS#: 1310-58-3

Pennsylvania Right to Know Components

Water	CAS#: 7732-18-5
Potassium Hydroxide	CAS#: 1310-58-3

New Jersey Right to Know Components

Water	CAS#: 7732-18-5
Potassium Hydroxide	CAS#: 1310-58-3

California Prop. 65 Components

This product does not contain any chemicals known to state of California to cause cancer, birth defects, or any other reproductive harm.

OSHA PSM TPQ

Not listed

Toxic Substances Control Act (TSCA)

CAS# 1310-58-3 is listed on the TSCA inventory.

Comprehensive Environmental Response Compensation Liability Act: (CERCLA)

CAS# 1310-58-3 is listed on the CERCLA list.

16. OTHER INFORMATION

NFPA Rating:
Health Hazard: 3
Fire Hazard: 0
Reactivity Hazard: 0

HMIS Rating:
Health hazard: 3
Chronic Health Hazard: Flammability: 0
Physical Hazard 0

Disclaimer: The information contained in this Safety Data Sheet (SDS), as of the issue date, is believed to be true and correct. However, the accuracy or completeness of this information and any recommendations or suggestions are made without warranty, express or implied, or guarantee. Tersus Environmental, LLC urges each customer or recipient of this SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. Since we cannot control the application, use or processing of the product, we do not accept responsibility. Therefore, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product and assure that the intended use of the product will not infringe in any party's intellectual property right. The information presented here pertains only to the product as shipped.

All recommendations for the use of our products, whether given by us, orally or to be implied from data or lab tests results by us, are based on the current state of our knowledge at the time those recommendations are made. When additional information is obtained, these recommendations may be updated. They may also be influenced by circumstances outside our control. Notwithstanding, such recommendation the user is responsible that the product as supplied by us is suitable to the process or purpose he/she intends to use it.

Due to the proliferation of sources for information such as manufacturer specific SDSs, we are not and cannot be responsible for SDSs obtained from any source other than ourselves. If you have obtained an SDS from another source or if you are not sure that the SDS you have is current, please contact us for the most current version.

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End of Safety Data Sheet