

SAFETY DATA SHEET



CAUSTIC SODA LIQUID (ALL GRADES)

North America EN
SDS No.: M32415

Rev. Date: 14-Mar-2022
Rev. Num. 11

SECTION 1. CHEMICAL PRODUCT / COMPANY IDENTIFICATION

Company Identification: Occidental Chemical Corporation
14555 Dallas Parkway, Suite 400
Dallas, Texas 75254-4300

24 Hour Emergency Telephone Number: 1-800-733-3665 (USA); CANUTEC (Canada): 1-613-996-6666; CHEMTREC (within USA and Canada): 1-800-424-9300; CHEMTREC (outside USA and Canada): +1 703-527-3887; CHEMTREC Contract No: CCN16186

To Request an SDS: MSDS@oxy.com or 1-972-404-3245

Customer Service: 1-800-752-5151 or 1-972-404-3700

Product Identifier: **CAUSTIC SODA LIQUID (ALL GRADES)**

Trade Name: Caustic Soda Diaphragm Grade 7%, 10%, 15%, 18%, 18.5%, 20%, 25%, 30%, 35%, 40%, 50%, Caustic Soda Membrane 6%, 7%, 18%, 20%, 25%, 30%, 48%, 50%, 50% Caustic Soda Membrane OS, 50% Caustic Soda Diaphragm OS, Membrane Blended, Membrane Cell Liquor, Diaphragm Cell Liquor, Caustic Soda Food Grade

Synonyms: Sodium hydroxide solution; Liquid Caustic; Lye Solution; Caustic; Lye; Soda Lye; Secondary Caustic Soda Liquids

Product Use: Caustic soda has a wide variety of applications in many industries, including pulp and paper, aluminum, soaps and detergents, textiles, petrochemicals and chemical processing, food processing

Uses Advised Against: Produced in a non-mercury cell process. Meets ANSI/AWWA B511-10 and Food Chemical Codex (FCC) test requirements; however, Caustic Soda is not produced under all cGMP requirements as defined by the FDA. Customers should evaluate food grade requirements for cGMP based upon their particular requirements

Chemical Family: Alkali Metal Hydroxide Solutions

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Note: All OxyChem's caustic soda meets the test requirements specified in the Food Chemicals Codex (FCC). Not all OxyChem's caustic soda is produced following all cGMP (current Good Manufacturing Practices) requirements as defined by the FDA (Food and Drug Administration). OxyChem does produce a food grade caustic soda, which is produced following cGMP requirements as defined by the FDA. OxyChem does not represent or warrant general compliance of this product for food use. Each prospective use of a product in a food or food related application must be carefully assessed against appropriate regulations by the user and it cannot be assumed that products meeting FCC test requirements are satisfactory for all uses without such assessment.

SECTION 2. HAZARDS IDENTIFICATION

OSHA REGULATORY STATUS: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

EMERGENCY OVERVIEW:

Color: Colorless to slightly colored
Physical State: Liquid
Appearance: Clear to opaque
Odor: Odorless

Signal Word: **DANGER**

MAJOR HEALTH HAZARDS: CAUSES SERIOUS EYE DAMAGE. CAUSES SEVERE SKIN BURNS AND EYE DAMAGE. Toxicity may be delayed and may not be readily visible.

PHYSICAL HAZARDS: MAY BE CORROSIVE TO METALS. Mixing with water, acid or incompatible materials may cause splattering and release of heat. Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated.

ECOLOGICAL HAZARDS: This material has exhibited moderate toxicity to aquatic organisms. Keep out of water supplies and sewers. This material is alkaline and may raise the pH of surface waters.

PRECAUTIONARY STATEMENTS: Do not breathe mist, vapors, or spray. Wash skin and contaminated clothing thoroughly after handling. Wash thoroughly after handling- exposure can cause burns which are not immediately painful or visible. Wear protective gloves, protective clothing, eye, and face protection. Keep only in original container or container compatible with product (see Section 7 - Safe Storage Conditions). Avoid release to the environment.

ADDITIONAL HAZARD INFORMATION: This material is corrosive. It may cause severe burns and permanent damage to any tissue with which it comes into contact. Toxicity may be delayed and may not be readily visible. To

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treat contacted tissue, flush with water to dilute. There is no specific antidote. Significant exposures must be referred for medical attention immediately.

HAZARD CLASSIFICATION:

GHS: PHYSICAL HAZARDS:	Category 1 - May be corrosive to metals
GHS: CONTACT HAZARD - SKIN:	Category 1A - Causes severe skin burns and eye damage
GHS: CONTACT HAZARD - EYE:	Category 1 - Causes serious eye damage
HAZARDS NOT OTHERWISE CLASSIFIED (HNOC):	- Aquatic Acute: Category 3 (Harmful to aquatic life)

UNKNOWN ACUTE TOXICITY: Not applicable.

GHS SYMBOL: Corrosive, Exclamation mark



GHS SIGNAL WORD: DANGER

GHS HAZARD STATEMENTS:

GHS - Physical Hazard Statement(s)

- May be corrosive to metals

GHS - Health Hazard Statement(s)

- Causes severe skin burns and eye damage
- Causes serious eye damage

Additional Hazards - GHS Hazards Not Otherwise Classified (HNOC):

- ACUTE AQUATIC HAZARD - CATEGORY 3: Harmful to aquatic life

GHS - Precautionary Statement(s) - Prevention

- Do not breathe mist, vapors, or spray
- Wash skin and contaminated clothing thoroughly after handling
- Wear protective gloves, protective clothing, eye, and face protection
- Keep only in original container or container compatible with product (see Section 7 - Safe Storage Conditions)

GHS - Precautionary Statement(s) - Response

- IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
- IF ON SKIN (or hair): Remove/Take off Immediately all contaminated clothing. Rinse skin with water/shower
- Wash contaminated clothing before reuse
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
- Specific treatment is urgent if inhaled (see First Aid information on product label and/or Section 4 of the SDS)
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- IF IN EYES: Immediately call a POISON CENTER or physician

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- Absorb spillage to prevent material damage

GHS - Precautionary Statement(s) - Storage

- Store in a secure manner
- Store in corrosive resistant and NON-ALUMINUM container with a resistant inner liner (NOTE: flammable hydrogen gas may be generated if aluminum container and/or aluminum fittings are used)

GHS - Precautionary Statement(s) - Disposal

- Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations

Physical Hazards of Significance Not Mentioned in GHS Classification

- Mixing with water may cause splattering and release of heat

Health Hazards of Significance Not Mentioned in GHS Classification

- Acute exposure may cause delayed chemical burns

Additional Hazard Information

Contact may cause delayed chemical burns

See Section 11: TOXICOLOGICAL INFORMATION

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Systematic Chemical Name	Common name	CAS Number	Percent [%]
Water	Dihydrogen monoxide	Water	7732-18-5	48.5 - 94.5
Sodium Hydroxide	Sodium hydroxide	Sodium hydroxide	1310-73-2	5.5 - 51.5
Sodium Chloride	Sodium chloride	Sodium Chloride	7647-14-5	0 - 15

Notes: All hazardous and non-hazardous components of product composition are listed.

SECTION 4. FIRST AID MEASURES

General Advice: Corrosive. This material may be corrosive to any tissue it comes in contact with. It can cause serious burns and extensive tissue destruction resulting in liquefaction, necrosis, and/or perforation. Immediate medical attention is required.

EYE CONTACT: Immediately flush contaminated eyes with a directed stream of water for as long as possible. Remove contact lenses, if present and easy to do. Continue rinsing. GET MEDICAL ATTENTION IMMEDIATELY. Washing eyes within several seconds of exposure is essential to achieve maximum effectiveness. Immediate decontamination of the eyes is essential. Irrigate for at least 30 minutes, continuing until the pH is between 7 and 8. Examine the eye with fluorescein stain and slit-lamp microscope. All patients should be reviewed the following day. Any evidence of injury requires specialist ophthalmological assessment. Follow standard protocols for the

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management of corrosive eye injury.

SKIN CONTACT: Immediately flush contaminated areas with water. Remove contaminated clothing, jewelry, and shoes immediately. Wash contaminated areas with large amounts of water. GET MEDICAL ATTENTION IMMEDIATELY. Treat skin burns following standard protocols for thermal burns. Thoroughly clean and dry contaminated clothing before reuse. Discard contaminated leather goods.

INHALATION: If inhalation of mists, vapors, or spray occurs and adverse effects result, remove to uncontaminated area. GET MEDICAL ATTENTION IMMEDIATELY. There is no specific antidote, treat symptomatically. Monitor symptomatic patients for increasing upper airway obstruction. Administer humidified oxygen to all patients with respiratory symptoms, and manage bronchospasm and chemical pneumonitis according to standard recommendations. In severe cases, early intubation and positive end expiratory pressure ventilation or other mechanical support can be required, or tracheostomy if intubation is unsuccessful or delayed.

INGESTION: If swallowed, do not induce vomiting. For definite or probable ingestion, do not administer oral fluids. If vomiting occurs spontaneously, keep airway clear. Monitor airway. Volume resuscitation (IV fluids) and circulatory support (CPR) may be required. Never give anything by mouth to an unconscious or convulsive person. GET MEDICAL ATTENTION IMMEDIATELY.

Most Important Symptoms/Effects (Acute and Delayed):

Corrosive. This material may be corrosive to any tissue it comes in contact with. It can cause serious burns and extensive tissue destruction resulting in liquefaction, necrosis, and/or perforation.

Acute Symptoms/Effects:

Eye: Serious Eye Damage. Eye exposures may cause eyelid burns, conjunctivitis, corneal edema, corneal burn, corneal perforation, damage to internal contents of the eye, permanent visual defects, and blindness and/or loss of the eye.

Skin: Skin Corrosion. Exposure to skin may cause redness, itching, irritation, swelling, burns (first, second, or third degree), liquefaction of skin, and damage to underlying tissues (deep and painful wounds).

Inhalation (Breathing): Respiratory System Effects: Exposure to airborne material may cause irritation, redness of upper and lower airways, coughing, laryngospasm, shortness of breath, bronchoconstriction, and possible pulmonary edema. Severe and permanent scarring may occur. Pulmonary edema may develop several hours after a severe acute exposure. Aspiration of this material may cause the same conditions.

Ingestion (Swallowing): Gastrointestinal System Effects: Exposure by ingestion may cause irritation, swelling, and perforation of upper and lower gastrointestinal tissues. Permanent scarring may occur.

Delayed Symptoms/Effects:

- Skin: Repeated and prolonged skin contact may cause a chronic dermatitis

Protection of First-Aiders: Protect yourself by avoiding contact with this material. Avoid contact with skin and eyes. Do not breathe vapors or spray mist. Do not ingest. Use personal protective equipment (PPE). Refer to Section 8 for specific PPE recommendations. At minimum, treating personnel should utilize PPE sufficient for prevention of bloodborne pathogen transmission.

Notes to Physician: Medical observation and assessment is recommended for all ingestions, all eye exposures, and symptomatic inhalation and dermal exposures. For symptomatic ingestion, do not administer oral fluids and consider investigation by endoscopy, X-ray, or CT scan. Esophageal perforation, airway compromise, hypotension, and shock are possible. For prolonged exposures and significant exposures, consider delayed injury to exposed

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tissues. There is no antidote. Treatment is supportive care. Follow normal parameters for airway, breathing, and circulation. Surgical intervention may be required.

Interaction with Other Chemicals Which Enhance Toxicity: None known.

Medical Conditions Aggravated by Exposure: May aggravate preexisting conditions such as eye disorders that decrease tear production or have reduced integrity of the eye; skin disorders that compromise the integrity of the skin; and respiratory conditions including asthma and other breathing disorders.

SECTION 5. FIRE-FIGHTING MEASURES

Explosive properties: This product is not combustible or explosive.

Extinguishing Media: Use extinguishing agents appropriate for surrounding fire. Use "alcohol" foam, dry chemical or carbon dioxide.

Unsuitable Extinguishing Media: Do not use water, will create an exothermic reaction. Water may create an alkaline solution which could impact waterways and aquatic species.

Specific Hazards: Sodium hydroxide in contact with water may generate enough heat to ignite adjacent combustible materials. Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. May react with chemically reactive metals such as aluminum, zinc, magnesium, copper, etc. to release hydrogen gas which can form explosive mixtures in air.

Unusual Hazards: Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

Fire Fighting: Move container from fire area if it can be done without risk. Cool containers with water. Do not apply water directly on this product. Heat is generated when mixed with water. Wear NIOSH approved positive-pressure self-contained breathing apparatus operated in pressure demand mode. Avoid contact with skin. Keep water runoff out of water supplies and sewers (see Section 6 of the SDS).

Advice for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Avoid contact with skin and eyes.

Component	Immediately Dangerous to Life/ Health (IDLH)
Sodium Hydroxide 1310-73-2	10 mg/m ³ IDLH

Above are IDLHs (immediately dangerous to life or health concentrations) for those substances designated by United States (US) National Institute of Occupational Safety and Health (NIOSH). The IDLH is considered a maximum concentration above which only a highly reliable breathing apparatus providing maximum worker protection should be permitted.

Hazardous Combustion Products: Sodium hydroxide fumes can be generated by thermal decomposition at elevated temperatures

Sensitivity to Mechanical Impact: Not sensitive.

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Sensitivity to Static Discharge: Not sensitive.

Lower Flammability Level (air): Not flammable

Upper Flammability Level (air): Not flammable

Flash point: Not flammable

Auto-ignition Temperature: Not applicable

GHS: PHYSICAL HAZARDS:

- Category 1 - May be corrosive to metals

Physical Hazards of Significance Not Mentioned in GHS Classification

- Mixing with water may cause splattering and release of heat

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Avoid contact with skin, eyes and clothing. Do not breathe vapors, mist, or spray. Wash skin and contaminated clothing thoroughly after handling. Wash thoroughly after handling- exposure can cause burns which are not immediately painful or visible. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Refer to Section 7, Handling, for additional precautionary measures. Take any precaution to avoid mixing with combustibles or incompatible materials. Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment: Wear protective gloves, footwear, clothing, eye, and face protection.

Emergency Procedures: All transfer facilities should have a documented spill prevention and containment program for all hazardous materials. Consideration must be given to the containment of caustic spills and leaks to comply with applicable federal, state, and local regulations.

Environmental Precautions: Keep out of water supplies and sewers. Do not flush into surface water or sanitary sewer system. This material is alkaline and may raise the pH of surface waters with low buffering capacity. Releases should be reported, if required, to appropriate agencies.

Methods and Materials for Containment, Confinement, and/or Abatement: Ventilate and contain spill to prevent spread. Completely contain spilled materials with dikes, sandbags, etc. After containment, collect the spilled material and transfer to a chemical waste area. Take any precaution to avoid mixing with combustibles or incompatible materials.

Methods and Materials for Clean-up

Recovery: In case of spill or leak, stop the leak as soon as possible. Small and large spills: Contain spilled material if possible. After containment, collect the spilled material and transfer to a chemical waste area. Liquid material may be removed with a properly rated vacuum truck. The recovered product must be transferred to an appropriate and compatible container (carbon steel, stainless steel, PVC, Fiberglass or similar). Seal and label container.

Neutralization: Neutralize residue with dilute acid and follow with a liberal covering of sodium bicarbonate or

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other acceptable drying agent. See Section 13, Disposal considerations, for additional information.

Final Disposal: Shovel dry material into suitable container. Recycle or dispose according to regulations.

Additional Disaster Prevention Measures: Use caution when selecting spill absorbents. Liquids with this reactive group classification have been known to react with the absorbents such as cellulose-based absorbents and mineral-based and clay-based absorbents. All storage tanks should be diked to contain the tank contents in the event of a spill or tank rupture. They should be large enough to contain the tank's volume, and an additional appropriate volume as a safety factor. Review regulations prior to construction.

SECTION 7. HANDLING AND STORAGE

Handling:

Precautions for Safe Handling: In handling caustic soda solutions, care must be taken to avoid solidification which will plug pipelines and equipment. Refer to manufacturer's Caustic Soda Handbook for more information on freezing points for solutions of caustic soda at various concentrations. Should a caustic soda solution become frozen in process equipment or piping, care must be taken when thawing the material. The use of atmospheric pressure steam is suggested. Accelerated corrosion can occur in areas where equipment is subjected to extremely high temperatures. Running steam through unlined steel piping systems can result in increased corrosion and iron pickup in the product. Never put water or steam directly into the product.

Technical measures/precautions: Weld pipelines where practical. Use flanged joints with gaskets made of caustic soda resistant material such as rubber, PTFE, or EPDM rubber. If a screwed fitting is used, apply Teflon® tape to the threads. Shield the seal area of pumps to prevent spraying of caustic solutions in the event of a leak. Unloading lines should be insulated and heated when used to transfer liquid caustic soda to storage in cold climates. The preferred method of heating is to provide electric or steam heat tracing around the unloading line, under the insulation.

Other precautions: When disconnecting equipment for repairs, first verify that there is no internal pressure on the equipment and the equipment has been drained and washed. When releasing air pressure from a pressurized system, take every precaution to avoid spurts or sprays of caustic solution.

Prevention of contact: Residues that dry on equipment can cause irritation. Keep equipment clean by washing off any accumulation. NEVER add water to product. When mixing, slowly add to water to minimize heat generation and spattering. Do not breathe mist, vapor, or spray. Wash skin and contaminated clothing thoroughly after handling. Wear protective gloves, footwear, clothing, eye, and face protection. See Section 8, Exposure Controls and Personal Protection, for additional information.

Storage:

Safe Storage Conditions: Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Do not store in aluminum container, or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated. Keep separated from incompatible substances (see below or Section 10 of the Safety Data Sheet).

Technical measures: Provide storage tanks with suitable overflow pipes. Overflow pipes should be directed to a protected overflow area away from operations. Prior to unloading shipment of caustic soda, make certain the storage tank has sufficient room available for the contents of the entire rail or tank car.

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Incompatible Substances:

- Acids and halogenated compounds
- Prolonged contact with aluminum, brass, bronze, copper, lead, tin, zinc or other alkali sensitive metals or alloys
- Releases heat when diluted in water or other solvents

Packaging or Materials of Construction: Recommended: High density polyethylene; fiberglass, steel lined internally with PVC, FRP or other similar and supported. Other corrosion resistant materials are titanium, tantalum and FRP. In addition, container should be equipped with adequate pressure release device. Materials not recommended: low density polyethylene; Brass, zinc, bronze, copper, aluminum, iron and alloys of these metals.

Additional Information:**GHS: PHYSICAL HAZARDS:**

- Category 1 - May be corrosive to metals

Physical Hazards of Significance Not Mentioned in GHS Classification

- Mixing with water may cause splattering and release of heat

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION**REGULATORY EXPOSURE LIMIT(S):**

Listed below for the product components that have regulatory occupational exposure limits (OEL's).

Component	OSHA Final PEL TWA	OSHA Final PEL STEL	OSHA Final PEL Ceiling
Sodium Hydroxide 1310-73-2	2 mg/m ³ mg/m ³	-----	-----

OEL: Occupational Exposure Limit; OSHA: United States Occupational Safety and Health Administration; PEL: Permissible Exposure Limit; TWA: Time Weighted Average; STEL: Short Term Exposure Limit

Component	Canada - TWAs	Canada - STELs	Canada - Ceilings
Sodium Hydroxide 1310-73-2	-----	-----	Ontario - 2 mg/m ³ (Ceiling)

NON-REGULATORY EXPOSURE LIMIT(S):

Listed below for the product components that have non-regulatory occupational exposure limits (OELs).

Component	ACGIH TWA	ACGIH STEL	ACGIH Ceiling	Skin Absorption - ACGIH	OSHA TWA (Vacated)	OSHA STEL (Vacated)	OSHA Ceiling (Vacated)
Sodium Hydroxide 1310-73-2	-----	-----	2 mg/m ³ (Ceiling)	-----	-----	-----	2 mg/m ³ mg/m ³

- The Non-Regulatory United States Occupational Safety and Health Administration (OSHA) limits, if shown, are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993). OSHA Ceiling values indicate the exposure limit, which at no time shall be exceeded. Instantaneous monitoring is the preferred method to determine compliance with

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OSHA Ceiling values. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute time weighted average exposure which shall not be exceeded at any time during the working day [29CFR1910.1000(a)(1)]

ACGIH TLV Ceiling (C) limits are airborne concentrations that should not be exceeded in the workplace under any circumstances. Ceiling limits can supplement other limits or stand alone.

ENGINEERING CONTROLS: Use closed systems when possible. Provide local exhaust ventilation where dust or mist may be generated. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear chemical safety goggles with a face shield to protect against eye and skin contact when appropriate. Provide an emergency eyewash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear protective clothing to minimize skin contact. Wear chemical resistant clothing and rubber boots when potential for contact with the material exists. Always place pants legs over boots. Contaminated clothing should be removed, then discarded or laundered. Discard contaminated leather goods.

Hand Protection: Wear appropriate chemical resistant gloves. If contact with forearms is likely, wear gauntlet style gloves. Consult a glove supplier for assistance in selecting an appropriate chemical resistant glove.

Protective Material Types: Natural rubber, Neoprene, Nitrile, Polyvinyl chloride (PVC), Tyvek®, Tychem®

Respiratory Protection: Where risk assessment shows air-purifying respirators are appropriate, use a NIOSH approved full-facepiece respirator with an N100, R100, or P100 filter. For an emergency or planned entry into unknown concentrations or IDLH conditions, use any self-contained breathing apparatus (SCBA) that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode OR any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus (e.g. airline with auxiliary escape pack). A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

Component	Immediately Dangerous to Life/ Health (IDLH)
Sodium Hydroxide 1310-73-2 (5.5 - 51.5 %)	10 mg/m ³ IDLH

Above are IDLHs (immediately dangerous to life or health concentrations) for those substances designated by United States (US) National Institute of Occupational Safety and Health (NIOSH). The IDLH is considered a maximum concentration above which only a highly reliable breathing apparatus providing maximum worker protection should be permitted.

Other Protective Equipment: Provide an emergency eyewash fountain and quick drench shower in the immediate work area.

HYGIENE MEASURES: Do not breathe mist, vapors, or spray. Do not get in eyes, on skin, or on clothing. Wear protective gloves, protective clothing, eye, and face protection. For environmental protection remove and wash all contaminated protective equipment before re-use. Use outdoors or in a well-ventilated area. Keep separated from incompatible substances.

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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Colorless to slightly colored
Odor:	Odorless
Odor Threshold [ppm]:	No data available
pH:	14.0 (theoretical value of 7.5% solution)
Freezing Point/Range:	-32 to 15°C (-26 to 59°F) [50% solution]
Boiling point / boiling range	102 - 144°C (215 - 291°F) [50% solution]
Flash point:	Not flammable
Evaporation Rate (ether=1):	No data available
Flammability (solid, gas):	Not flammable
Lower Flammability Level (air):	Not flammable
Upper Flammability Level (air):	Not flammable
Vapor Pressure:	13 - 135 mmHg @ 60 °C
Water Solubility:	100%
Vapor Density (air=1):	No data available
Relative Density/Specific Gravity (water=1):	1.05 – 1.56 @ 15.6 °C
Density:	8.8 - 13.0 lbs/gal @ 15.6 °C
Partition Coefficient (n-octanol/water):	No data available
Auto-ignition Temperature:	Not applicable
Decomposition Temperature:	No data available
Viscosity:	About 24cp for 50% solution at 40 °C (104 °F)
Molecular Weight:	40.01
Molecular Formula:	NaOH
Chemical Family:	Alkali Metal Hydroxide Solutions

Other Information

Volatility: No data available

Refer to manufacturer's Caustic Soda Handbook for more information on physical and chemical properties for solutions of caustic soda at various concentrations and temperatures.

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability: Stable at normal temperatures and pressures.

Reactivity: Soluble in water, releasing heat sufficient to ignite combustibles. Reacts with metals and may form hydrogen gas. Reacts with acids, giving off heat.

Possibility of Hazardous Reactions: May react with chemically reactive metals such as aluminum, zinc, magnesium, copper, etc. to release hydrogen gas which can form explosive mixtures in air. Mixing with water, acid, or incompatible materials may cause splattering and release of large amounts of heat. Will react with some metals forming flammable hydrogen gas. Carbon monoxide gas may form upon contact with reducing sugars, food and beverage products in enclosed spaces. Accidental contact of 50% sodium hydroxide solution with residual

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trichloroethanol in a pump caused an explosion. This was confirmed in laboratory experiments. Chlorohydroxyacetylene, the isomeric chloroketene or chlorooxirene, may have been formed by elimination of hydrogen chloride. In addition, reacts to form explosive products with ammonia + silver nitrate (forms silver nitride); N,N'-bis(trinitroethyl)urea (in storage).

Conditions to Avoid (e.g., static discharge, shock, or vibration): No information available.

Incompatible Substances: Acids and halogenated compounds. Prolonged contact with aluminum, brass, bronze, copper, lead, tin, zinc or other alkali sensitive metals or alloys. Releases heat when diluted in water or other solvents.

Hazardous Decomposition Products: Toxic fumes of sodium oxide.

Hazardous Polymerization: Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS:

TOXICITY:

When in solution, this material will affect all tissues with which it comes in contact. The severity of the tissue damage is a function of its concentration, the length of tissue contact time, and local tissue conditions. After exposure, there may be a time delay before irritation and other effects occur. This material is a strong irritant and is corrosive to the skin, eyes, and mucus membranes. This material may cause severe burns and permanent damage to any tissue with which it comes into contact.

ACUTE TOXICITY:

Eye contact: Corrosive. Causes serious eye damage, which can result in severe irritation, pain and burns, and permanent damage including blindness.

Skin contact: Corrosive. Causes severe skin burns. Prolonged or repeat skin exposures can result in dermatitis.

Inhalation: Corrosive. Inhalation injury may result from ingestion and/or aspiration of this material. May cause severe irritation of the respiratory tract with potential airway compromise, coughing, choking, pain, and burns of the mucous membrane and respiratory system. This material can be extremely destructive to the tissue of the mucus membranes and respiratory system. Aspiration may cause chemical pneumonitis, pulmonary edema, damage to lung tissue, death.

Ingestion: Corrosive. If swallowed, may cause severe oral and esophageal, mucus membrane, and gastrointestinal burns and possible perforation. If swallowed, may pose a lung aspiration hazard during vomiting.

CHRONIC TOXICITY:

Chronic Effects: Repeated or prolonged skin contact may result in dermatitis.

SIGNS AND SYMPTOMS OF EXPOSURE:

This material may cause severe burns and permanent damage to any tissue with which it comes into contact. It can cause serious burns and extensive tissue destruction resulting in liquefaction, necrosis and/or perforation. Signs and symptoms of exposure vary, and are dependent on the route of exposure, degree of exposure, and duration of exposure.

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Inhalation (Breathing): Respiratory System Effects: Exposure to airborne material may cause irritation, redness of upper and lower airways, coughing, laryngeospasm, shortness of breath, bronchoconstriction, and possible pulmonary edema. Severe and permanent scarring may occur. Pulmonary edema may develop several hours after a severe acute exposure. Aspiration of this material may cause the same conditions.

Skin: Skin Corrosion. Exposure to skin may cause redness, itching, irritation, swelling, burns (first, second, or third degree), liquefaction of skin, and damage to underlying tissues (deep and painful wounds).

Eye: Serious Eye Damage. Eye exposures may cause eyelid burns, conjunctivitis, corneal edema, corneal burn, corneal perforation, damage to internal contents of the eye, permanent visual defects, and blindness and/or loss of the eye.

Ingestion (Swallowing): Gastrointestinal System Effects: Exposure by ingestion may cause irritation, swelling, and perforation of upper and lower gastrointestinal tissues. Permanent scarring may occur.

Interaction with Other Chemicals Which Enhance Toxicity: None known.

GHS HEALTH HAZARDS:

GHS: CONTACT HAZARD - SKIN: Category 1A - Causes severe skin burns and eye damage

GHS: CONTACT HAZARD - EYE: Category 1 - Causes serious eye damage

TOXICITY DATA:

PRODUCT TOXICITY DATA: Data is from studies conducted internally

LD50 Oral:	LD50 Dermal:	LC50 Inhalation:
No reliable data available	No reliable data available	No data available

COMPONENT TOXICITY DATA: The data are from public databases sources

Component	Oral LD50	Dermal LD50	Inhalation LC50
Sodium Hydroxide	325 mg/kg (Rat)	1350 mg/kg (Rabbit)	-----
Sodium Chloride	3 g/kg (Rat)	>10000 mg/kg (Rabbit)	>42 mg/L (1-h Rat)

Standard Draize (Eye): PRIMARY EYE IRRITATION: Severe Irritation, Corrosive (rabbit, 24 hr).

Eye Irritation/Corrosion: Corrosive to the eyes and may cause severe damage including blindness.

Standard Draize (Skin): PRIMARY SKIN IRRITATION: Severe Irritation, Corrosive (rabbit, 24 hr)

Skin Irritation/Corrosion: This product is classified as causing severe skin burns (Category 1, H314), according to GHS classification criteria.

Skin Absorbent / Dermal Route: NO

Material is corrosive to the skin and will produce damage to the skin prior to systemic effects being observed.

RESPIRATORY OR SKIN SENSITIZATION: Not Known. No evidence of skin sensitization was seen in either human or laboratory animal exposure studies to sodium hydroxide.

CARCINOGENICITY: This product is not classified as a carcinogen by NTP, IARC or OSHA. Systemic carcinogenicity is not expected to occur because in water and other biological matrices, sodium hydroxide (NaOH) will hydrolyze to the sodium and hydrogen ions. NaOH is not systemically available under normal conditions.

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SPECIFIC TARGET ORGAN TOXICITY (Single Exposure): Although there is a case report of a worker who developed irreversible obstructive lung disease after exposure to 5% sodium hydroxide (NaOH) aerosols in a poorly ventilated room, this is a single case report. The effects observed are related to the corrosivity and not specifically to an effect of NaOH.

SPECIFIC TARGET ORGAN TOXICITY (Repeated or Prolonged Exposure): Sodium hydroxide may cause irreversible obstructive airway disease after long term (for 20 years) regular unprotected exposure (no respiratory protective equipment); however, this outcome is due to a bronchial inflammatory reaction caused by the corrosive effects of sodium hydroxide and is not considered a systemic health outcome. Systemic health effects are not expected under normal handling and use conditions (non-irritating) because the concentration of sodium in the blood nor the pH of the blood will be increased.

INHALATION HAZARD: Exposure to airborne material may cause irritation, redness of upper and lower airways, coughing, laryngeal spasm and edema, shortness of breath, bronchio-constriction, and possible pulmonary edema. The pulmonary edema may develop several hours after a severe acute exposure.

GERM CELL/IN-VITRO MUTAGENICITY: Sodium hydroxide was negative in an in vitro Ames reversion assay without metabolic activation. In another in vitro study, exposure of Chinese hamster ovary cells to Sodium hydroxide with metabolic activation resulted in chromosomal aberrations in 7.8% of the 400 cells scored. The chromosome aberration frequency increased to 17% along the S9 concentration, but excessive cell toxicity was not seen, and the authors concluded that the mutagenic response was due to the combined effects of pH and metabolic activation, and not to the mutagenicity of Sodium hydroxide. The available data do not meet the classification criteria for Germ Cell Mutagenicity.

REPRODUCTIVE TOXICITY: Sodium Hydroxide is not expected to be systematically available in the body under normal handling and use conditions and for this reason it can be stated that the substance will not reach the fetus nor male or female reproductive organs.

DEVELOPMENTAL TOXICITY: Not classified as a developmental or reproductive toxin per GHS criteria.

TOXICOKINETICS: Not available.

METABOLISM: Not available.

ENDOCRINE DISRUPTOR: This product does not contain any known or suspected endocrine disruptors.

NEUROTOXICITY: Not Available.

IMMUNOTOXICITY: Not available.

Health Hazards of Significance Not Mentioned in GHS Classification

- Acute exposure may cause delayed chemical burns

SECTION 12. ECOLOGICAL INFORMATION**ECOTOXICITY (EC, IC, and LC):**

Component:	Freshwater Fish:	Invertebrate	Algae Toxicity:	Other Toxicity:
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		Toxicity:		
Sodium Hydroxide 1310-73-2 (5.5 - 51.5 %)	*LC50 Oncorhynchus mykiss: 45.4 mg/L 96h static	-----	No data available	No data available
Sodium Chloride 7647-14-5 (0 - 15 %)	*LC50 Lepomis macrochirus: 5560 - 6080 mg/L 96h flow-through *LC50 Lepomis macrochirus: 12946 mg/L 96h static *LC50 Pimephales promelas: 6020 - 7070 mg/L 96h static *LC50 Pimephales promelas: 7050 mg/L 96h semi-static *LC50 Pimephales promelas: 6420 - 6700 mg/L 96h static *LC50 Oncorhynchus mykiss: 4747 - 7824 mg/L 96h flow-through	*EC50 Daphnia magna: 340.7 - 469.2 mg/L 48h *EC50 Daphnia magna: 1000 mg/L 48h	No data available	*LC50 Eisenia foetida (48 h filter paper) 0.1 - 1 mg/cm ²

Aquatic Toxicity:

In water, Sodium Hydroxide (NaOH) will hydrolyze to the sodium and hydrogen ions and do not represent a specific hazard. The buffering capability of the environmental compartment will determine the extent of the toxicological response. This material has exhibited moderate toxicity to aquatic organisms. Data provided are for sodium hydroxide.

Fish Toxicity:

LC50 Brook trout: 25 ppm/24 hr
LC50 King salmon: 48 ppm

Invertebrate Toxicity:

EC50 Daphnia magna: 100 ppm
EC50 Shrimp: 33 - 100 ppm/48 hr.
EC50 Cockle: 330 - 1000 ppm/48 hr.

FATE AND TRANSPORT:

PERSISTENCE: This material is alkaline and may raise the pH of surface waters with low buffering capacity. This material is believed to exist in the disassociated state in the environment.

BIODEGRADATION: This material is inorganic and not subject to biodegradation.

BIOCONCENTRATION: This material is not expected to bioconcentrate in organisms.

BIOACCUMULATIVE POTENTIAL: Does not bioaccumulate.

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MOBILITY IN SOIL: NaOH is a strong alkaline substance that dissociates completely in water to Na⁺ and OH⁻. High water solubility and low vapor pressure indicate that NaOH will be found predominantly in aquatic environment. This implies that it will not adsorb on particulate matter or surfaces. Atmospheric emissions as aerosols are rapidly neutralized by carbon dioxide and the salts will be washed out by rain.

ADDITIONAL ECOLOGICAL INFORMATION: This material has exhibited slight toxicity to terrestrial organisms. This material has exhibited moderate toxicity to aquatic organisms.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste from material:

Reuse or reprocess, if possible. Keep out of water supplies and sewers. May be subject to disposal regulations. Dispose in accordance with all applicable regulations.

Container Management:

Dispose of container in accordance with applicable local, regional, national, and/or international regulations. Container rinsate must be disposed of in compliance with applicable regulations.

Contaminated Material:

Contaminated packaging should be disposed of as unused product.

SECTION 14. TRANSPORT INFORMATION

LAND TRANSPORT

U.S. DOT 49 CFR 172.101:

UN NUMBER: UN1824
PROPER SHIPPING NAME: Sodium Hydroxide Solution
HAZARD CLASS/ DIVISION: 8
PACKING GROUP: II
LABELING REQUIREMENTS: 8
RQ (Lbs.): RQ 1000 lbs. (Sodium Hydroxide)

Special provisions for transport: Not applicable.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

UN NUMBER: UN1824
SHIPPING NAME: Sodium hydroxide solution
CLASS OR DIVISION: 8
PACKING/RISK GROUP: II
LABELING REQUIREMENTS: 8

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MARITIME TRANSPORT (IMO / IMDG)

UN NUMBER: UN1824
PROPER SHIPPING NAME: Sodium hydroxide solution
HAZARD CLASS / DIVISION: 8
Packing Group: II
LABELING REQUIREMENTS: 8

AIR TRANSPORT (ICAO / IATA)

UN Number: 1824
Proper shipping name: Sodium hydroxide solution
Hazard Class: 8
Packing group: II
Special Instructions CAO: IATA Certificate for shipping personnel is required

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code The substance poses risks from the point of view of safety (S) and contamination (P). Classified as "Y", presents a danger to marine resources or human health.

SECTION 15. REGULATORY INFORMATION**U.S. REGULATIONS****OSHA REGULATORY STATUS:**

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):

If a release is reportable under CERCLA section 103, notify the state emergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 426-2675.

Component	U.S. DOT Hazardous Substances/ RQs	CERCLA Hazardous Substances / RQs	CERCLA Section 302 EHS EPCRA RQs	Section 302 Threshold Planning Quantity (TPQ)
Sodium Hydroxide 1310-73-2 (5.5 - 51.5)	1000 lbs(RQ) lbs. (RQ)	1000 lbs. (RQ)	Not listed	Not Listed
Sodium Chloride 7647-14-5 (0.001 - 35)	Not Listed	Not Listed	Not Listed	Not Listed

SARA EHS Chemical (40 CFR 355.30)

No components are listed.

EPCRA SECTIONS 311/312 HAZARD CATEGORIES (40 CFR 370.10):

Acute Health Hazard

SARA HAZARD CATEGORIES ALIGNED WITH GHS (2018):

Physical Hazard - Corrosive to Metal
Health Hazard - Skin Corrosion or Irritation
Health Hazard - Serious eye damage or eye irritation

EPCRA SECTION 313 (40 CFR 372.65):

No components are listed.

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DEPARTMENT OF HOMELAND SECURITY (DHS)- Chemical Facility Anti-Terrorism Standards (6 CFR 27):

No components in this material are regulated under DHS

OSHA PROCESS SAFETY (PSM) (29 CFR 1910.119):

Not regulated.

FDA: This material has Generally Recognized As Safe (GRAS) status under specific U.S. Food and Drug Administration (FDA) regulations. Additional information is available from the Code of Federal Regulations, which is accessible on the FDA's website. Only food grade product is guaranteed to be produced under all current Good Manufacturing Practices (cGMP) requirements as defined by the FDA. Food grade product is produced in a facility that is accredited as a Safe Quality Food (SQF) Level 2 Facility, certified under the Global Food Safety Initiative (GFSI), and meets the Food Chemical Codex (FCC) requirements

EPA'S CLEAN WATER AND CLEAN AIR ACTS:

Component(s) not listed on impacted regulatory lists.

Component	Clean Water Act - Priority Pollutants	CAA - ODS CLASS 1 AND CLASS 2	CAA - Volatile Organic Compounds (VOCs) in SOCM	CAA - HON Rule - Organic HAPs	CAA - Hazard Air Pollutants	CAA - Urban HAPs List (Integrated Urban Strategy)	SNAP - Substitutes for ODS	EPA RMP Toxic or Flammable TPQ
Sodium Hydroxide 1310-73-2 (5.5 - 51.5 %)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
Sodium Chloride 7647-14-5 (0.001 - 35 %)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

NATIONAL INVENTORY STATUS**U.S. INVENTORY STATUS: Toxic Substance Control Act (TSCA):**

Component	TSCA Inventory	TSCA ACTIVE LIST	TSCA 12(b)	TSCA/Section 4	TSCA/Section 5	TSCA/Section 6	TSCA/Section 8
Sodium Hydroxide 1310-73-2 (5.5 - 51.5 %)	Listed	ACTIVE	Not Listed	Not Listed	Not Listed	Not listed	Not Listed
Sodium Chloride 7647-14-5 (0.001 - 35 %)	Listed	ACTIVE	Not Listed	Not Listed	Not Listed	Not listed	Not Listed

Canadian Chemical Inventory: All components of this product are listed on either the DSL or the NDSL.

Component	DSL	NDSL
Sodium Hydroxide 1310-73-2 (5.5 - 51.5 %)	Listed	Not Listed
Sodium Chloride 7647-14-5 (0.001 - 35 %)	Listed	Not Listed

STATE REGULATIONS**California Proposition 65:**

This product is not listed on the California Governor's current list of Carcinogens, Reproductive Toxicants, and/or Candidate Carcinogens (Proposition 65), but it may contain trace amounts of impurities that are listed. For

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additional information, contact Occidental Chemical Corporation Customer Service (1-800-752-5151 or 1-972-404-3700).

Component	California Proposition 65 Cancer WARNING:	California Proposition 65 CRT List - Male reproductive toxin:	California Proposition 65 CRT List - Female reproductive toxin:	Massachusetts Right to Know Hazardous Substance List	Rhode Island Right to Know Hazardous Substance List
Sodium Hydroxide 1310-73-2 (5.5 - 51.5 %)	Not Listed	Not Listed	Not Listed	Listed	Listed
Sodium Chloride 7647-14-5 (0.001 - 35 %)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

Component	New Jersey Right to Know Hazardous Substance List	New Jersey Special Health Hazards Substance List	New Jersey - Environmental Hazardous Substance List	Pennsylvania Right to Know Hazardous Substance List	Pennsylvania Right to Know Special Hazardous Substances	Pennsylvania Right to Know Special Hazardous Substances	Pennsylvania Right to Know Environmental Hazard List
Sodium Hydroxide	1706	Corrosive	Not Listed	Listed	Not Listed	Not Listed	Present
Sodium Chloride	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

CANADIAN REGULATIONS

This product has been classified in accordance with the hazard criteria of the Workplace Hazardous Materials Information System (WHMIS 2015) which includes the amended Hazardous Products Act (HPA) and the Hazardous Product Regulations (HPR).

Component	Canada - CEPA - Schedule I - List of Toxic Substances	Canada - NPRI	Canada - CEPA - 2010 Greenhouse Gases (GHG) Subject to Mandatory Reporting	Canadian Chemical Inventory:	NDSL
Sodium Hydroxide 1310-73-2 (5.5 - 51.5)	Not Listed	Not Listed	Not Listed	Listed	Not Listed
Sodium Chloride 7647-14-5 (0.001 - 35)	Not Listed	Not Listed	Not Listed	Listed	Not Listed

SECTION 16. OTHER INFORMATION

Prepared by: Occidental Chemical Corporation - HES&S Product Stewardship Department

Rev. Date: 14-Mar-2022

Reason for Revision:

- Updated Company's logo in SDS header
- Change of company physical address: SEE SECTION 1
- Updated 24 Hour Emergency Telephone Number: SEE SECTION 1
- Product Name and/or Trade Name(s) has been revised: SEE SECTION 1
- Updated Product Use information: SEE SECTION 1
- Updated Uses Advised Against information: SEE SECTION 1
- Food grade quality notes added: SEE SECTION 1
- Modified the Emergency Overview information: SEE SECTION 2
- Modified GHS Hazard and Precautionary Statements: SEE SECTION 2

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- Added Health Hazards Not Otherwise Classified: Section 2 and 11
- The formulation has been revised: SEE SECTION 3
- Updated First Aid Measures: SEE SECTION 4
- Modified Fire Fighting Measure Recommendations: SEE SECTION 5
- Revised Accidental Release Measures: SEE SECTION 6
- Revised Handling and Storage Recommendations: SEE SECTION 7
- Added Canadian exposure levels: SEE SECTION 8
- Added an explanation statement for "Ceiling Value" exposure levels: SEE SECTION 8
- Revised Exposure Controls/Personal Protection information: SEE SECTION 8
- Added Hygiene Measures SEE SECTION 8
- Updated Physical and Chemical Properties. SEE SECTION 9
- Updated Possibility of Hazardous Reactions: SEE SECTION 10
- Toxicological Information has been revised: SEE SECTION 11
- Ecological Information has been modified: SEE SECTION 12
- Updated Disposal Considerations. SEE SECTION 13
- Added air transport certificate requirements for shipping personnel: SEE SECTION 14
- Added SARA Hazard Categories Aligned with GHS (2018): SEE SECTION 15
- Updated TSCA Status Table: SEE SECTION 15
- Revised California Proposition 65 Statement: SEE SECTION 15
- Modified statement on Canadian classification rule. SEE SECTION 15
- WHMIS Classifications were removed from format: SEE SECTION 15
- Updated Canadian Regulatory information: SEE SECTION 15

IMPORTANT:

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OSHA Standard 29 CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Safety Data Sheet available to your employees.

End of Safety Data Sheet
