

# Caustic Soda (Sodium Hydroxide)

**Refer to the Material Safety Data Sheet (MSDS) before handling this material.**

**CAS Number: 1310-73-2**  
**Chemical Formula: NaOH**

## What is caustic soda?

Caustic soda is also known as sodium hydroxide, caustic, and lye. Caustic soda is a strong, colorless alkali. Georgia Gulf supplies a liquid caustic soda solution at a concentration of 50%. Georgia Gulf produces liquid caustic soda by the electrolysis of naturally occurring salt in water (brine) in our chlor-alkali process in Plaquemine, Louisiana.

## How is caustic soda used?

Caustic soda is a versatile alkali. One of the largest consumers of caustic soda is the pulp and paper industry where it is used in pulping and bleaching processes, the de-inking of waste paper, and water treatment. The production of alumina from bauxite is another major end-use application for caustic soda.

Caustic soda is a basic feedstock in the manufacture of a wide range of chemicals. It is used as an intermediate and a reactant in processes that produce solvents, plastics, synthetic fibers, bleach, adhesives, coatings, herbicides, dyes, inks, and pharmaceuticals such as aspirin. It is also used to neutralize acidic waste streams and the scrubbing of acidic components from off-gases.

## Physical/Chemical Properties

Caustic soda, as a 50% solution, is an odorless and colorless liquid. In all forms, caustic soda is highly corrosive and reactive. Caustic soda solution reacts readily with metals such as aluminum, magnesium, zinc, tin, chromium, bronze, brass, copper, and alloys containing these metals. Galvanized (zinc coated) materials should be avoided. Contact with acids, halogenated organics, organic nitro compounds, and glycol should be avoided. It reacts with most animal tissue, including leather, human skin, and eyes. It also reacts readily with various reducing sugars (i.e., fructose, galactose, maltose, dry whey solids) to produce carbon monoxide.

Properties of Caustic Soda Solution 50%	
Boiling Point	Approximately 289°F (143°C)
Melting Point	Crystallization begins 54-49°F (12-15°C)
Solidification Point	41°F (5°C)
Solubility	Soluble in water, alcohol, and glycerol
Specific Gravity (Water = 1.0)	1.53 at 60°F (15.6°C)
pH	>14.0 at 20°C

### **Health and Safety Information**

This material is extremely corrosive and highly reactive. It can cause severe eye, skin, and respiratory tract burns. Read and follow all instructions on the product label and review the Material Safety Data Sheet (MSDS) to understand and avoid the hazards associated with caustic soda.

Caustic soda solution is highly toxic by ingestion and may cause severe burns of the mouth, throat, and stomach even with short exposure. Inhalation of caustic soda as a dust, mist, or aerosol may cause respiratory irritation that can develop into serious lung injury depending on the degree of exposure. Eye contact with caustic soda mist or solution usually results in immediate pain and can cause permanent eye damage including blindness. Skin contact may result in irritation, which may not be immediately painful.

If there is an exposure to caustic soda solution, immediate first aid is required. Immediately flush exposed areas such as eyes and contaminated skin with large amounts of water and seek medical attention promptly. If this chemical has been swallowed and the person is conscious, give water and/or milk immediately to dilute the caustic soda; no more than eight ounces in adults and four ounces in children is recommended to minimize the risk of vomiting. Do not attempt to induce vomiting. Get emergency medical attention immediately.

There is no evidence that caustic soda is a skin sensitizer or is readily absorbed through the skin. It is not a known carcinogen, mutagen, developmental or reproductive toxicant.

Before handling, it is important that engineering controls are operating and protective equipment requirements and personal hygiene measures are being followed. People working with this chemical should be properly trained regarding its hazards and its safe use.

### **Environmental Information**

Caustic soda does not bioaccumulate due to its high solubility in water. It is considered slightly toxic to aquatic organisms unless there is a significant pH shift outside the range of 5 – 10, which may be toxic to aquatic organisms.

### **Exposure Potential**

Caustic soda is corrosive and precautions should be taken to minimize potential harm to people and the environment. Precautions should include using the proper protective equipment and following all label instructions and warnings on consumer products. Based on the uses for caustic soda, the public could be exposed through the following:

**Workplace exposure** – Exposure can occur either in a caustic soda manufacturing facility or in the various industrial facilities that use caustic soda. Caustic soda has been used for more than 100 years by industry. When exposures occur, they are most frequently to the skin and eyes, although oral exposure and ingestion are possible. Good industrial hygiene practices minimize the risk of exposure. Additionally, most processes using caustic soda use closed tanks and vessels.

Both OSHA (Occupational Safety and Health Administration) and ACGIH (American Conference of Governmental Industrial Hygienists) have established occupational airborne exposure limits for caustic soda. The OSHA Permissible Exposure Limit (PEL) is an 8 hour Time-Weighted Average (TWA) of 2 mg/m<sup>3</sup> (milligrams per cubic meter) and the ACGIH Threshold Limit Value (TLV) is a Ceiling Limit of 2 mg/m<sup>3</sup>.

Caustic soda solution is non volatile. However, care should be taken to avoid generating mists that can be inhaled. Applications that involve spraying this product or mixing this product with other solutions may increase the risk of exposure if proper precautions are not followed.

**Consumer exposure** – Georgia Gulf does not sell caustic soda through retail stores.

**Environmental releases** – In the event of a spill, the focus is on containing the spill to prevent contaminated soil, surface or ground water. Caustic soda can significantly increase the pH of soil and/or water.

Industrial spills (releases to soil or water) are infrequent. However, when they do occur, they are controlled by workplace spill programs which include containment around loading and unloading operations and storage tanks and employee training. Many aspects of a spill control program are mandated by federal, state and local requirements. In addition, if a spill occurs, federal reporting may be required.

### **Product Stewardship**

Georgia Gulf Corporation is committed to manage Caustic Soda so that it can be safely used by its customers. Georgia Gulf's relationships with its customers encourage communication about safety and environmental stewardship.

Georgia Gulf Corporation is staffed and organized to provide advice regarding appropriate corrective actions if an incident should occur.

### **Conclusion**

Although caustic soda is a hazardous material that is regulated for public safety, caustic soda and its everyday end-use consumer products such as paper, aluminum, and textiles are essential to our health and way of life. Because caustic soda is highly corrosive and reactive, care must be taken so that it is used in a safe manner that minimizes its release to the environment.

**Notice**

Prior to its use, the user is responsible for determining the suitability of the product or products covered by this Product Stewardship Summary and for complying with all federal, state, and local laws and regulations in connection with its use. Neither Georgia Gulf nor any of its affiliates shall be responsible for any damages of any kind whatsoever resulting from the use of or reliance on this Product Stewardship Summary or product or products to which it refers.

This Product Stewardship Summary is intended only to provide a general summary of the potential hazards associated with the product or products described herein. It is not intended to provide detailed information about potential health effects and safe use and handling information and, although Georgia Gulf believes this information is correct, Georgia Gulf makes no warranties as to its completeness or accuracy. Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the Georgia Gulf product(s) mentioned in this document. Before working with any of these products, users must read and become familiar with the available information on product hazards, proper use, and handling. Information is available in several forms, such as material safety data sheets (MSDS) and product labels. A copy of Georgia Gulf's MSDS for caustic soda can be obtained by going to the company's website ([www.georgiagulf.com](http://www.georgiagulf.com)) and clicking "Products."

This information is subject to change without notice.

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Legal Approval: July 28, 2009

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**Contact GGC's RCMS® Team**

To contact a member of Georgia Gulf Corporation's Responsible Care® staff, [click here](#).

You can also write us for additional information at:

Georgia Gulf Corporation  
Responsible Care Coordinator  
P.O. Box 629  
Plaquemine, Louisiana 70765-0629

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