

# 50% Liquid Caustic Soda (Sodium Hydroxide) NaOH

Liquid caustic soda is a colorless solution supplied at a concentration of 50%. It is soluble in water and glycerol. It is a strong alkali and is very corrosive. Georgia Gulf manufactures liquid caustic soda by the electrolysis of brine at our plant in Plaquemine, Louisiana.

## Properties

Molecular weight	40
Boiling point, °C	143
°F	289
Melting point	
(crystallization begins), °C	12-15
°F	54-59
Solidification point, °C	5
°F	41
Specific gravity @ 15.6/15.6°C (60/60 °F)	1.53
Weight per gallon, lb.	12.76

## Typical Analysis

Sodium Hydroxide (NaOH), wt. %	49.00-51.00 ASTM E-291
Sodium Oxide (Na <sub>2</sub> O), wt. %	38.00-39.50 ASTM E-291
Sodium Carbonate (Na <sub>2</sub> CO <sub>3</sub> ), wt. %	0.20 maximum ASTM E-291
Sodium Chloride (NaCl), wt. %	1.10 maximum ASTM E-291
Sodium Chlorate (NaClO <sub>3</sub> ), wt. %	0.35 maximum ASTM D-2022
Sodium Sulfate (Na <sub>2</sub> SO <sub>4</sub> ), wt. %	0.02 maximum ASTM E-291
Iron (Fe), wt. %	0.0007 maximum ASTM E-291

## Uses

The largest use for caustic soda is in chemical and metal manufacturing, especially aluminum. It also has significant use in the manufacture of pulp and paper. It is used as a textile sizing agent as well as being an ingredient in soap and detergents. Some miscellaneous uses for caustic soda are in petroleum refining, food processing laboratory reagents and electroplating.

## Reactivity/Corrosivity

In pulp bleaching and in the kraft process for papermaking, solutions of caustic soda are usually hot. Hot caustic solutions are especially hazardous because of the combined effect of the increased reactivity of the hot solution and heat burns on body tissue. It is imperative that caustic soda does not come in contact with body tissue. The chemical may cause severe damage even though no pain or irritation is felt.

The addition of caustic soda to solutions to increase their caustic concentrations should be made in increments of 5%. The additions should be made slowly and with good agitation; otherwise overheating may occur resulting in boiling or spattering. Water should not be added to solid caustic or to concentrated solutions since considerable heat will be generated and may cause boiling and spattering. Violent or explosive reactions may also occur on contact between caustic soda and many organic compounds. Liquid caustic soda and solutions of caustic soda attack metals such as aluminum, tin, zinc and alloys containing these metals. Iron and copper are slowly corroded by a caustic soda solution. Use of these metals in contact with caustic soda may cause contamination of this product making it unsuitable for certain applications.

Because of its corrosive nature, caustic soda also attacks wool, leather and other clothing materials. However, it is non-corrosive to rubber or neoprene garments and shoes.

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Although liquid caustic soda is a highly corrosive material, it has no flash point and will not autoignite. Although it is non-combustible, sufficient heat may be generated upon contact with moisture or water to ignite nearby combustible materials. Contact with some metals may generate flammable hydrogen gas.

## Handling and Storage

Liquid caustic soda should be stored in a dry place away from acids, metals, explosives, organic compounds and other materials that are easily ignited. Containers should be protected from contact with moisture and water. Electrical equipment should also be protected from contact with moisture and water, and it should be designed to prevent deterioration or shorting, which can result from prolonged contact of caustic soda on wiring and terminals. Local and federal regulations as well as insurance codes must be considered whenever caustic soda is stored, used or handled.

All storage, transfer and process equipment should be constructed of an alkali -resistant material and inspected regularly to prevent leaks or other failures. Although carbon steel is generally used, contamination of liquid caustic soda may result from contact. Temperatures should be maintained below 140°F to prevent stress corrosion cracking (caustic embrittlement). Where temperatures above 140°F are necessary, stress-relieved containers, or nickel clad, nickel plated or nickel alloy containers, should be used. Stainless steel is sometimes used where external corrosion may occur. Copper, brass, chromium and bronze are moderately attacked and should not be used. Do not use zinc, tin, magnesium or aluminum for caustic soda service since these materials are rapidly attacked liberating flammable hydrogen gas. Epoxy resins and some neoprene type elastomers have been used successfully as tank linings.

## International Sales Offices

In case of fire, flood with water exercising caution not to spatter the material.

Caustic soda spills may need to be reported to the National Response Center (800-424-8802). Disposal of spill material should be in compliance with local, state and federal regulations.

**More information on the safe handling of caustic soda is in the Material Safety Data Sheet available from Georgia Gulf.**

## Shipping

Georgia Gulf supplies liquid caustic soda in ocean going vessels, tank cars and tank trucks. It is shipped from our plant in Plaquemine, Louisiana and from several points in our nationwide storage and distribution network.

The Department of Transportation (DOT) regulates the shipment of liquid caustic soda, and information concerning placarding and reportable quantity requirements for any quantity of shipment is available from the DOT Materials Transportation Bureau or from Georgia Gulf.

Liquid caustic soda is classified by the DOT as a corrosive material; its proper shipping name is sodium hydroxide, liquid. The Hazardous Material Identification number is UN 1824. Any signs of leaking product during shipping or unloading should be given prompt attention. In case of emergency, contact CHEMTREC at 800-424-9300.

## Sales and Service

Competent sales personnel are available to help meet your needs with Georgia Gulf chemicals.