

PELS® Caustic Soda



PELS® caustic soda is a convenient form of dry caustic soda developed by PPG Industries. The tiny beads, close to ¼ millimeter in diameter, offer superior properties: little or no dust, excellent flow properties, uniform size, excellent blending characteristics, structural strength, high bulk density and low moisture pickup, resulting in less caking or lumping.

The magnified photos (right) show the uniform, spherical shape of PELS caustic soda. Also, note that PELS caustic soda beads show little /or no dust. The spherical shape, having a minimum surface area per pound, minimizes moisture pickup. Freedom from dust on the bead surface also slows moisture pickup. The remarkable size uniformity of PELS caustic soda beads eliminates storage bin segregation and reduces the likelihood of hang-up due to bridging.

The spherical shape also enables PELS caustic soda beads to roll and flow easily. In CSD (closed system delivery)—the closed-loop pneumatic conveying system developed by PPG for bulk shipping and unloading—the beads are easier to convey and produce far less dust than flakes.

General Applications

The host of different uses of caustic soda derive mainly from its reactivity as a strong alkali. Caustic soda is used:

In detergent and cleaners—In mechanical bottle-washing and glass washing, caustic soda is the alkali. It is also incorporated in industrial detergent formulations based on other chemicals. Caustic soda is the chief ingredient of drain pipe cleaners.

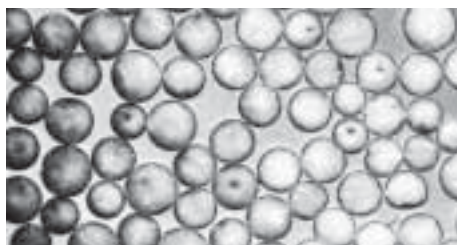
In manufacturing other chemicals—Besides its use as a reactive intermediate, caustic soda is also used in chemical processing plants for scrubbing and drying.

In petroleum exploration as a treating agent in oil well drilling fluids.

In water treatment for softening pH control and regenerating resin beds.



Loose dust surrounds caustic soda flakes.



PELS caustic soda beads are dust-free.

In boiler compounds to remove scale.
In paint- and varnish-removers.
In food processing plants and dairies to clean equipment, also for peeling fruits and vegetables.

In metal plants for cleaning metals; for example, sheet steel in galvanizing plants.

In tanneries for reacting with sodium sulfhydrate to make sodium sulfide used in dehairing, to neutralize acidity after chrome tannage, and for cleaning purposes.

In textile plants as an aid in scouring, bleaching and neutralizing.

In drum-reconditioning operations.

In a variety of plants making products ranging from glue, gelatin, grease and cosmetics to dry batteries.

Product Grades

PPG produces PELS caustic soda beads with an average diameter of ¼ millimeter, corresponding to 25 mesh. These technical-grade beads of caustic soda meet the specifications of the Food Chemicals Codex, fourth edition (1996 edition) and U.S. Pharmacopoeia (1995 edition).

PPG also manufactures caustic soda liquor as the 50% and 73% solutions in water. See PPG's product bulletin, *Liquid Caustic Soda*.

Typical Properties

Chemical Names:	Sodium hydroxide; caustic soda
Chemical Formula:	NaOH
Molecular Weight:	40.005
Description:	Dry caustic soda has a white color and a microcrystalline structure. It is anhydrous, hygroscopic (attracting moisture) and deliquescent (dissolving in moisture absorbed from the atmosphere) and reacts with carbon dioxide in the air to form sodium carbonate. Caustic soda is not combustible and does not support combustion.
Alkali Equivalent:	100% NaOH= 77.48% Na ₂ O
Melting Range:	°C 310 to 320 °F 590 to 608
Heat of Solution:	Exothermic
Solubility in Water:	at 0°C (32°F) 42 g/100g water at 100°C (212°F) 347 g/100g water
Solution Rate:	Twice as fast as flake
Refractive Index:	1.3576
Specific Gravity:	1.9
Bulk Density:	
Compacted	73lb/ft ³
Loose	70lb/ft ³
Particle Shape:	Spherical
Flowability:	Excellent
Friability:	Very Low
Dust:	Very Low

Typical Screen Analysis

U.S. Mesh	Weight % On Screen
14	<1
16	3
20	31
25	41
30	17
35	5
60	2
170	<1

Specifications

	Weight %
NaOH	96 min.
Na ₂ O	74.4 min.
Na ₂ CO ₃	1.6 max.
NaCl	2.2 max.
Fe	.0015 max.

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Health Hazards

Caustic soda is corrosive. Caustic soda particles that contact the skin can cause severe burns. If a small quantity reaches the eye and is not flushed out immediately, it can result in permanent damage or loss of vision. Every second is critical because caustic soda attacks the skin and eye tissues rapidly. Flushing should be continued for at least 15 minutes. To make sure that water contacts all surface tissues of the eye and lid, hold the eyelids apart while flushing. To irrigate the upper eyelid, raise it and roll it back. Call a physician, preferably an eye specialist, as soon as possible. Continue eye irrigation until the physician arrives. Persons working around caustic soda should wear close-fitting goggles with face shield, rubber gloves, rubber boots, a rubber apron, a cotton or polyester long sleeved shirt and a plastic hard hat.

Swallowing or overexposure to caustic soda can cause severe damage to tissues and could be fatal.

Caustic soda can react with various food sugars to generate carbon monoxide. Hazardous concentrations can form upon contact of caustic soda with food and beverage products, and can cause death. Workers should follow appropriate tank entry procedures (see ANSI Z177.1-1972).

More information on the health hazards of caustic soda appears in the PPG booklet *Be Careful With Caustic*, available on request. Also refer to the Material Safety Data Sheet (MSDS).

In Case of Emergency

In case of an emergency, call the PPG Industries' Emergency Response Center at: 412-434-4515. In Canada call Canutec at 613-996-6666.

Handling and Storage

Users should take care to avoid breaking or puncturing bags and drums of caustic soda, and thereby avoid contact with this corrosive material. Since dry caustic soda left exposed to the atmosphere absorbs moisture and reacts with carbon dioxide, containers must be kept closed. Drums and bags should be stored in a dry place indoors.

Stock Rotation—Due to its hygroscopic nature, PELS caustic soda bead inventory should be rotated on a FIFO basis to ensure that all product is consumed within a 180-day period. This will minimize any product agglomeration in the package.

Handling Spills or Leaks—Shovel up; then flush the spill area with water. For details, refer to the MSDS.

Dissolving PELS Caustic Soda—A short period of mechanical agitation is all that is needed to dissolve PELS caustic soda in water completely.

CAUTION

Do not add water to caustic soda beads. The proper way is to add the beads slowly to the surface of cold water and agitate while they dissolve to avoid violent eruption or explosive reaction. If the water is not agitated, adding caustic soda beads rapidly is dangerous. The danger is greater if the water is warm instead of cold. The high heat of solution of dry caustic soda may cause a sudden violent eruption of caustic solution. Also, a layer of concentrated solution may form and suddenly mix with a layer of less concentrated solution. In this case, the high heat of solution may create steam and cause the solution to erupt.

Packaging and Shipping

PELS caustic soda is shipped in 500-pound and 100-pound steel drums, in 500-pound fiber drums, 2000 and 2200-pound super sacks and in 50-pound bags. PPG can supply the bags on sturdy pallets protected by a shrink-wrapped polyethylene film. All drums and bags are moisture-resistant. They are delivered by rail and truck.

PPG owns the pressure-differential cars and trailers used for CSD (closed system delivery) of PELS caustic soda in bulk. The capacity of a bulk hopper car is 95 tons, and a bulk hopper trailer holds 20 tons. A PPG brochure describing CSD is available upon request.

Shipping Points—Bulk car and truck shipments are made from PPG plants at Lake Charles, Louisiana, and Natrium, West Virginia. Bulk truck shipments are also made from the Fremont, California, terminal. Drum and bag shipments are made from Lake Charles, and Natrium.

PPG also has a nationwide network of strategically located warehouses. For current information on shipping points close to your plant, call 800-243-6774.

Customer Service

Samples are available upon request. For more information regarding PPG's PELS caustic soda, contact our customer service department by calling **800-CHEM-PPG (800-243-6774)**.

PPG's technical and product safety staff is available to provide additional information on technical issues, applications, handling and storage, and health and safety concerns.



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The products mentioned herein can be hazardous if not used properly. Any health hazard and safety information contained herein should be passed on to your customers or employees, as the case may be. PPG Industries also recommends that, before use, anyone using or handling this product thoroughly read and understand the information and precautions on the label, as well as in other product safety publications such as the Material Safety Data Sheet.

Like all potentially hazardous materials, this product must be kept out of the reach of children.

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