

Product Application Guide

Date	August 24, 2021
Product name	Caustic Soda Microprills
Formula	NaOH (s)
CAS No.	1310-73-2
REACH No.	01-2119457892-27
EINECS / ELINCS No.	215-185-5
UN code	1823
Note	To the best of its knowledge, Nobian declares this document to accurately describe the product's physical, chemical and/or manufacturing process attributes. Nobian does not make any warranty as to the suitability of its products for any application.

Caustic soda Microprills

Caustic Soda Microprills are solid small fused white pearls, color- and odorless and very hygroscopic. The product is free of anti-caking and flow agents and offers significant advantages to conventional granules or flakes:

- excellent free flowing properties
- low tendency to stick and agglomerate
- distinguished for air lifting
- highly resistant to abrasion
- minimal dust formation
- well suited for transportation in road tankers, containers and big bags
- excellent storable in silo installations
- precise dosage
- rapidly dissolving in water, methanol and ethanol

Delivery Unit

Caustic Soda Microprills are dispatched in:

- PE bags a 25 kg;
- PE drums a 227 kg;
- flexible big bags a 1000 kg;
- bulk by road tanker;

Other containers (e.g. ISO containers) may be filled on request.

Cargo tanks must be clean and thoroughly dry to avoid any possibility of contamination and clumping.

Production quality

Caustic Soda Microprills meets the chemical purity requirements of:

- EU food additive regulation*
- EU feed additive regulation*
- EU cosmetics regulation
- Food Chemicals Codex (FCC)

- US Pharmacopeia (USP/NF)
- European Pharmacopoeia and subordinate national Pharmacopoeias
- EN 896, type 2 (for treatment of water intended for human consumption)

Application possibilities

Aluminium Industry

To digest bauxite, for smelting plants and rolling mills, for etching semi-finished and finished products.

Automotive Industry

For degreasing and paint stripping.

Biodiesel Production

For the preparation of methanolic caustic soda solution (sodium methanolate) which is required as catalyst for the transesterification of vegetable oil with methanol to biodiesel.

Building Industry

For production of bitumen emulsions, for removing paints and varnishes; preparation of construction materials.

Chemical and Pharmaceutical Industry

Basic auxiliary and processing material in the chemical industry and many related branches.

To prepare sodium compounds, water glass (soluble glass, sodium silicates); for neutralization purposes, pH-adjustment (alkalizing), and as compound of industrial cleaners; waste air cleaning.

Cellulose Gum

Large scale production of methylcellulose, derivatives thereof and carboxy-methylcellulose which are used in many different applications, e.g. as paste and wallpaper glue, additive for construction materials, thickening agent (foodstuff additive, in cosmetic and pharmaceutical formulations), emulsifying and dispersing agent, protective colloid, etc.

Farming

Disinfectant of stables to control foot-and-mouth disease of cattle. Cleaning of machines and pipes especially for milk collecting apparatus.

Fat and Oil Factories

To purify edible oils and fats, and to remove oil and fat residues.

Food & Beverage Industry

Production of food and beverage, e.g. to produce pretzels. Generally, for pH-adjustment (neutralization), cleaning and disinfection of glassware, machines, tools and rooms, e.g. Cleaning in Place (CIP) in dairies and in dairy farms to clean milk churns, centrifuges, pasteurization vessels, milk bottles etc.

Caustic Soda lye produced by Nobian can be used in the EU as processing aid in the food or feed industry as they fulfil all purity requirements (chemical parameters) of applicable food or feed additive monographs and regulations as mentioned on our product specification sheet. The caustic soda production facilities of Nobian are not registered as EU food or feed facility after the European Food or Feed Laws (Regulation (EC) 852/2004 or Regulation (EC) 1831/2003 and others). Hence Nobian Caustic Soda lye must not be used as food or feed additive in the EU. It remains the end users' obligation to ensure that a processing aid does not pose any adverse health effect in the final food or feed product. For generally permitted uses of this product in the EU we refer to the eSDS, which lists all REACH registered uses with their safe use conditions.

Gasworks

For absorption of acidic gases and vapours, for ammonia recovery.

Leather Industry

Used in liming process to help swell the hides or skins.

Metal Industry

To remove paint and oil from metal and making of black finishing agents (bronzing, burnishing).

Mining

For pH adjustment in coal and ore flotation.

Natural Adhesive and Gelatin Factories

For digestion, neutralization and disinfection.

Oil Production and Refining

For oil wells, pH regulation in exploratory drilling, refining, desulphurization and water treatment, waste air cleaning.

Pulp Mills and Paper Industry

To extract cellulose (pulp fiber) from wood, straw and rags, for pulp refining, processing of cellulose and paper.

Surfactants and Soap Industry

Manufacture of surfactants (soaps, detergents, washing powder, health care products); pH-adjustment.

Textile Industry

Processing of cotton and used in the dyeing process of synthetic fibers such as nylon and polyester.

Wastewater Treatment

To neutralize acid wastewater and sewage, as auxiliary flocculant.

Water Treatment

Treatment of drinking water and industrial water (water softening, pH adjustment and regeneration of ion-exchange resins).

Wood and Furniture Industry

Cauterizing and paint removing of wood and furniture.

Safety and Handling

- Caustic soda Microprills absorb moisture and carbon dioxide readily from air and may turn partially to sodium carbonate (soda) or liquefy to concentrated caustic soda solution.
- The product is very soluble in water and dissolves very rapidly to caustic soda solution liberating a lot of heat; in methanol and ethanol it is well soluble.
- Caustic Soda Microprills and caustic soda solutions thereof are very corrosive to many materials and have to be handled with great care. Aluminum, lead, tin, zinc, alloys like brass, bronze, light metals and others are attacked under evolution of hydrogen gas.

This information is to our best knowledge. For additional safety data and/or PPE usage, we refer to our material safety data sheets (MSDS).

Dispatch and storage

Materials for Tanks and Containers

Tank material for Caustic Soda Microprills is usually made of carbon steel (mild steel) though stainless steel (alloyed steel, "V4A") is best to maintain the high purity. Nickel and nickel alloys are also suited as is any other material which is equipped with a chemically and abrasively resistant in-liner or coating. In-liners can be made of rubber, Polyethylene (PE), Polypropylene (PP), Polyvinylchloride (PVC), Hypalon[®], fluorinated polymers like PTFE, PVDF, PFA, Halar[®], Viton[®] etc.

Steel drums may have an internal lacquer coating e.g. varnish stoved or annealed enamel if resistant to caustic soda, though an in-liner (bag made of polyethylene) is preferable.

Glass-fiber reinforced plastic (GFR) on basis of polyester and epoxy, polyurethanes (PU), polyamides (PA), polycarbonates (PC), styrene acrylonitrile copolymers (PAN) or soft PVC have to be protected with a resistant in-liner or coating.

Glass, ceramics and porcelain are usually suited but may be corrosively attacked by the presence of concentrated caustic soda solution, Materials for Tanks, Containers, piping and mounted equipment especially when being hot, that may form by contact of caustic soda with moisture.

Aluminium, magnesium, light-alloys, lead, tin, zinc, brass and bronze are not appropriate in unprotected condition as tank material for they are attacked or dissolved under evolution of flammable hydrogen gas.

Consult the MSDS for dangerous good classification and packaging codes.

Storage Conditions & Shelf-Life

Caustic Soda Microprills are extremely hygroscopic and may liquefy to caustic soda solution if handled unprotected even for a short period of time. It will also absorb carbon dioxide (CO₂) from air to give partially sodium carbonate (soda ash).

Therefore vessels, tanks, drums and bags containing Caustic Soda Microprills have to be kept well tight and stored in a dry place to strictly prevent uptake of moisture and carbon dioxide from air which are the cause for clumping.

When the 25 kg PE bags are stored on a pallet, no more pallets should be put on top of it to avoid compacting and clumping of the Caustic Soda Microprills. In addition, stapled pallets will get instable during transport and storage, and bags might burst under the additional weight.

Storage tanks should be sealed from air by a pressure relief/equalizing line provided with a drying cartridge (renewable silica gel absorber) or by flushing with dry air or dry nitrogen in case of high-quality requirements. The dew point of blanket gas should be less than -40 °C.

With respect to all these recommendations Caustic Soda Microprills will remain in spec for at least 2 years.

Technical Data and physical properties

Molecular Weight	g/mol	40.00
Melting Temperature	°C	Approx. 321
Heat of Solution at 20 °C	kJ/mol	42.3
Bulk density	kg/m ³	1100 - 1200
<u>Particle size distribution</u>		
1.2 – 2.0 mm	% w/w	< 2
0.5 – 1.2 mm	% w/w	> 93
0 – 0.5 mm	% w/w	< 5
<u>Solubility</u>		
in Water at 10 °C	g/L	420
in Water at 20 °C	g/L	1090
in Water at 100 °C	g/L	3420
in Methanol at 20 °C	g/L	238
in Ethanol at 20 °C	g/L	139