

Caustic Soda

Alkalinity Source

Description

CAUSTIC SODA is used in water-base muds as a source of hydroxyl ions to control pH. Caustic Soda, caustic, alkali and lye are all common names for sodium hydroxide (NaOH). It is a strong base which is extremely soluble in water and dissociates into sodium (Na) and hydroxyl (OH) ions in solution.

Applications/functions

- Controls the pH and alkalinity properties of water-base fluids
- Precipitates magnesium (Mg²⁺) and suppresses calcium (Ca²⁺) in high hardness waters
- Neutralizes acid gases such as carbon dioxide (CO₂) and hydrogen sulfide (H₂S)
- Reduces corrosion and prevents biodegradation
- Activates and solubilizes lignitic products in drilling fluids

Advantages

- Widely available and economic source of hydroxyl ions to control pH
- Concentrated chemical, very effective at small treatment levels

Typical properties

- | | |
|----------------------|-----------------------------------|
| • Appearance | White pellets, flakes or crystals |
| • Specific gravity | 2.13 g/cm ³ |
| • pH (1% solution) | 13.0 |
| • Solubility at 30°C | 1,087 kg/m ³ |

Recommended treatment

Typical concentrations range from 0.7 to 11.4 kg/m³ with treatments depending on water chemistry and type of drilling fluid.

When using to reduce hardness:

$$\text{Caustic Soda (kg/m}^3\text{)} = [\text{Mg (mg/l)} \times 0.00325 \times \text{Fw}] + [\text{Ca (mg/l)} \times 0.00198 \times \text{Fw}]$$

Where: Fw = Water fraction (% water/100)

When treating fluids with tannin based thinners, which have low pH (±4), typical usage is 1 sack of Caustic Soda for every 4 sacks of thinner.

Package

Caustic Soda is packaged in 25 kg sacks.
