# SODIUM BICARBONATE

## Product Description

SODIUM BICARBONATE is used in water-base muds as a source of bicarbonate ions to precipitate calcium and reduce pH. It is primarily used for treating cement contamination. Common names for SODIUM BICARBONATE (NaHCO₃) are bicarbonate of soda, bicarb and baking soda. It is a very weak base which is soluble in water and dissociates into sodium (Na) and bicarbonate (HCO₃⁻) ions in solution.

### Typical Physical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical appearance</td>
<td>White powder</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>2.16</td>
</tr>
<tr>
<td>pH (1% solution)</td>
<td>8.3</td>
</tr>
<tr>
<td>Solubility @ 86°F (30°C)</td>
<td>11.1 g/100 ml water</td>
</tr>
<tr>
<td>Bulk density</td>
<td>50 – 68 lb/ft³ (801 – 1,089 kg/m³)</td>
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</tbody>
</table>

## Application

SODIUM BICARBONATE is an economical and effective treatment for cement contamination. It precipitates calcium, reduces pH and deflocculates cement-contaminated fluids.

Cement contains calcium hydroxide (lime) and related compounds which increase pH and calcium concentration. These changes flocculate bentonite-based muds, resulting in increased rheology and fluid loss. High pH and calcium can precipitate many common polymer additives, particularly the acrylic-base polymers such as POLY-PLUS (HPAA), SP-101 and TACKLE. Typical treatments with SODIUMBICARBONATE range from 0.5 to 2 lb/bbl (1.43 to 5.7 kg/m³). The amount of cement to be drilled and the degree of cement curing should be used as a basis for all treatments. Contamination with uncured “green” cement requires higher treatments. Treatments should be made on an incremental basis (usually 0.5 lb/bbl or 1.43 kg/m³) to prevent overtreatment, which results in bicarbonate/carbonate flocculation.

One pound (0.45 kg) of SODIUM BICARBONATE will remove 0.88 lb (0.4 kg) of lime, which is roughly equivalent to 1.3 lb (0.6 kg) of cement.

## Advantages

- Widely available and is an economic treatment for cement contamination.
- Concentrated chemical; is effective at low treatment levels.
- Reduces pH, which helps maintain a reasonable pH in cement-contaminated muds.
- Non-hazardous chemical and generally recognized as safe.

## Limitations

- Unless a low pH is desired, SODIUM BICARBONATE should not be used to treat soluble calcium in water-base muds and makeup waters; soda ash should be used to reduce calcium and soften makeup water.
- When treating severe cement contamination, SODIUM BICARBONATE will not reduce pH by itself; an acid or other pH-reducing additive should be used with SODIUM BICARBONATE for these situations.

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Important Note: These suggestions and data are based on information we believe to be reliable. They are offered in good faith, but without guarantee, as conditions and method of use of our product are beyond our control. We recommend that the prospective user determine the suitability of our material and suggestions before adopting them on a commercial scale.
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Cement Contamination

- Overtreatment results in bicarbonate, or carbonate, contamination. Even minor amounts of excess carbonate and bicarbonate ions can cause large increases in yield point, gel strengths and fluid loss.

Toxicity and Handling

Handle as an industrial chemical, wearing protective equipment and observing the precautions described in the Material Safety Data Sheet (MSDS).

It is slightly alkaline which may cause mild irritation to eyes and skin. SODIUM BICARBONATE should be added slowly to the mud system by mixing through the hopper. Do not mix SODIUM BICARBONATE directly with acids or alkaline materials, including citric or acetic acid, caustic soda and lime.

Packaging and Storage

SODIUM BICARBONATE is packaged in 50- and 100-lb (22.7- and 45.4-kg), multi-wall, paper sacks. SODIUM BICARBONATE is a globally available commercial chemical; other pack-age sizes include: 25, 40, 45 and 50 kg (55, 88, 99 and 110 lb) and in various styles of paper or plastic sack containers. Store in a dry area away from water, acids and alkaline chemicals.

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