

Neutral Zone

Insoluble Solid Buffer

Neutral Zone® is an insoluble colloidal buffer that is suspended in water. Unlike soluble buffers it can be injected at high concentrations without causing an adversely high pH. When acids are present in groundwater the food grade insoluble calcium carbonate dissolves to form soluble bicarbonate. This normally limits pH to 8.5 or less in the injection area. Other soluble buffer materials can flush out of the treatment area with groundwater flow, limiting treatment time. Neutral Zone® solids are mobile during injection and are retained in the treatment area, unaffected by normal groundwater flow velocities.

Application

Neutral Zone® is normally diluted from 50% solids by weight to 0.5% to 2.0% solids and injected below the water table. After injection the retained solids slowly release sodium bicarbonate when acids are present. Solids can settle out if diluted product is not mixed for a period of several days. Best practice is to stir the suspension or make small batches of diluted material every few hours.

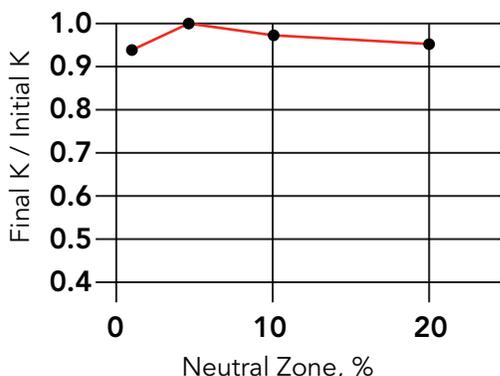
Benefits – Stable Suspension

Neutral Zone® stability is the result of a careful selection of sub-micron calcium carbonate materials, proprietary additives, and manufacturing methods. The calcium carbonate solids will stay suspended for several years in the concentrated 50% solids product. Once diluted to 5% solids, hydrometer testing (ASTM standard D-422 without added dispersant) shows that more than 90% of the solids will stay suspended for a 24 hour period. Solids will eventually settle out of the diluted material when it is allowed to stand without stirring.

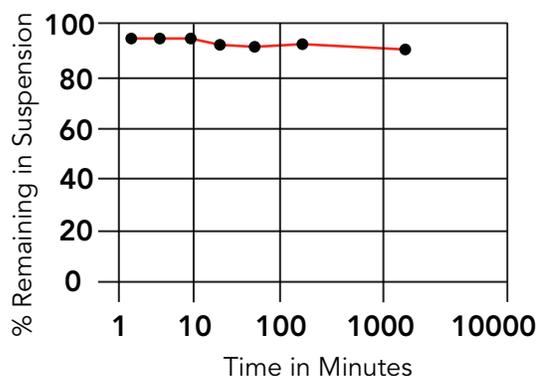
Benefits – Mobility, Retention, Minimal Permeability Loss

Laboratory columns show that concentrations of 0.5% to 10% solids move easily through clean fine sand at a ground water velocity of ~50 feet per day. This velocity is much higher than would be encountered under ambient conditions, but would commonly be created during injection. After injection the solids are retained in the treatment area – column studies show solids are retained even at simulated groundwater velocity of 8 feet per day. Minimal permeability loss was observed in solids concentrations below 5%. Field applications to date have been limited to 3% solids or less, with good injection flows and no evidence of buffer solids moving out of the treatment area after the injection is completed.

FINAL PERMEABILITY LOSS



HYDROMETER TEST



Neutral Zone

Insoluble Solid Buffer

Product Content

Chemical Name	CAS Number	Composition
Calcium Carbonate	471-34-1	50%
Ethyl Alcohol	64-17-5	5%
Food Grade Surfactant Blend	Proprietary	<1%
Water	7732-18-5	44%

Product Characteristics

Parameter	Unit	Specification
Density	g/cm ³	1.45
Flash Point	°F	130
Appearance		Opaque White Slurry

Packaging

Neutral Zone® is available in 5-gallon pails (60 pounds net) and 55-gallon drums (600 pounds net). For large projects, ethanol-free Neutral Zone® can be shipped in totes (3,000 pounds net).

Storage

Neutral Zone® is stable for several years in chilled storage. We recommend limiting storage on site to two to four months without refrigeration prior to injection. Avoid freezing conditions. Freezing may cause permanent separation of the suspended solids.

Safety

The primary ingredient in Neutral Zone® is calcium carbonate. Stabilizing additives are food grade or non-toxic. Neutral Zone® is not toxic, corrosive, or otherwise hazardous to the environment or to those who ship, handle, or dispose of the material.