Well Maintenance Acid (30% Active) (Salt-Scale-Rust-Lime-Sand)

ACID STICKS® are water-soluble sticks that release acid down-hole in water injection wells to remove carbonate scale and rust deposits. **ACID STICKS®** are a combination of acid, surfactant, dispersing agent, iron sequesters and inhibitor in solid form

PRODUCT USES & ADVANTAGES:

ACID STICKS® are ***primarily used in water injection wells*** to remove carbonate scale, rust deposits, and lower injection pressures. Injection pressure drops of several hundred PSI have been observed following ***ACID STICK®*** treatments. ***Some wells have gone on vacuum and taken water by gravity.*** Success has also been experienced in some oil wells, gas wells, and water supply wells.

ACID STICKS® are dropped directly into the well or introduced to the system through the water supply tank. Dropping the stick directly into a well is best because not as much dilution will occur. In a well with tubing obstructions or small valve opening, ***ACID STICKS®*** may be successfully used by first dissolving the sticks in fresh water and then pumping or pouring the solution into the well.

ACID STICKS® are very economical (as compared to conventional scale removal operations) and can eliminate or delay the need for HCl acid treatments. Continuous treatment with ***ACID STICKS®*** (especially after a conventional acid or clean-out job) can extend the time period between future scale removal operations. ***ACID STICKS® are less corrosive to steel pipe than conventional liquid HCl acid jobs because most of the acid generated by the stick is released down hole.*** Conventional liquid HCl acid reacts with the steel, rust, and scale inside the pipe all the way down the well. ***ACID STICKS® are corrosion inhibited and mildly corrosive to steel (like inhibited amid sulfonic acids).***

ACID STICKS® are safe to handle and easy to use by less experienced field personnel; however, like all acids, contact with eyes or skin should be avoided. ***ACID STICKS®*** are safe to use in cement lined tubing and plastic lined pipe. Continued treatments over long periods of time through a by-pass feeder into cement lined pipe should be avoided.

TREATMENT DETERMINATION & PROCEDURE:

The number of ***ACID STICKS®*** to be used is based on the number of feet of perforated interval or open hole and severity of scale build-up. ***Field tests indicate the best results were achieved by using a large initial slug treatment (1.8 to 5.4 lbs. of stick per foot of interval) followed by smaller periodic treatments (about half the initial slug amount).***

PART NUMBER	STICK SIZES	STICK RATIO INITIAL SLUG TREATMENT
ACL-2010	3/4 X 15	1 TO 3 Sticks Per Foot of Interval
ACL-2035	1 X 15	2 TO 5 Sticks Per Foot of Interval
ACL-2050	1 1/4 X 15	2 TO 6 Sticks Per Foot of Interval
ACL-2075	1 3/8 X 15	3 TO 9 Sticks Per Foot of Interval
ACL-2080	1 5/8 X 15	8 TO 24 Sticks Per Foot of Interval

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NOTE: A REACTIVE EQUIVALENCY of ACID STICKS vs. HCl ACID RATIO

This was determined by field tests. These tests indicated that about *10 Senior Acid Sticks® dropped in an injection well resulted in an equivalent pressure drop as did using 120 gallons of 15% HCl acid.* Liquid HCl acid loses strength by reacting on the steel, scale, and rust inside of the pipe all the way down the well while the sticks release most of their acid down-hole.

THE MOST COMMON PROCEDURE

Is to shut-in well and drop sticks through lubricator and return well to injection. This procedure is best for open-hole, no rat-hole, low rate wells, or wells deeper than 3,300 feet. FOR SHALLOW PERFORATED WELLS WITH RAT HOLE drop sticks and leave well shut-in about 15 minutes or until sticks fall to the perforations (whichever occurs first) then return well to injection. *The time in minutes for the sticks to fall to the perforations in a shut-in well is equal to the depth of perforations divided by 110. (Time, min = Depth, ft/110)*

PRODUCT SPECIFICATIONS:

The stick will *normally dissolve in 30 to 90 minutes (in moving water or when falling through water) depending on temperature, salt content, and relative water motion.* The stick will melt at 123°F. The stick will dissolve in water in wells with BHT below 123° (just at a slower rate). Lab tests indicate the dissolving rate in moving 50,000 PPM brine water to be 1 hour & 45 minutes @ 100°, 38 minutes @ 120°, 7 minutes @ 140°, and 2 minutes @ 180°. *If slowing the dissolving rate is desired coat ACID STICKS® with oil or grease. The specific gravity is 1.23. The falling velocity through fresh water is approximately 110 feet per minute.*

FOR INDUSTRIAL USE ONLY:

CAUTION: As with all industrial chemicals, contact with eyes or skin should be avoided. Wash thoroughly with water. Pellets should be stored in a cool dry place. Always remove pellets from the container with the scoop provided while wearing rubber gloves to avoid skin contact. Goggles are advised.

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