



Excellent Water Stick

NORTHERN STAR SOAP STICKS are water soluble sticks containing a combination of surfactants. Natural gas bubbling through the water-column and surfactants produce foam which can help remove water from watered up gas wells.

PRODUCT USES & ADVANTAGES:

NORTHERN STAR SOAP STICKS are primarily used to remove water from gas wells and increase gas production. The foaming action decreases the hydrostatic back-pressure which increases gas production that further enhances the foaming action until the well unloads.

NORTHERN STAR SOAP STICKS can be used to remove fluid from gas-condensate wells and flowing oil wells. *For gas-condensate wells with more than 35% condensate, it is recommended to use OIL FOAM STICKS™ in conjunction with NORTHERN STAR SOAP STICKS.*

NORTHERN STAR SOAP STICKS are used to increase the swabbing efficiency and life of swab cups. The slick coating along with the foaming action increases efficiency and life of the swab cups and allows the well to flow easier. **The perforations are often cleaned as a result of the surfactants and swabbing action.**

NORTHERN STAR SOAP STICKS are used in water injection wells in combination with ACID STICKS® to help reduce injection pressures. *Surfactants contained in NORTHERN STAR SOAP STICKS can help remove oil coatings on scale.* This helps the **ACID STICKS®** react with the exposed scale.

NORTHERN STAR SOAP STICKS are an economical way to remove water from gas wells without using expensive well service operations such as swabbing, jetting with coiled tubing, or installing artificial lift and siphon strings.

TREATMENT DETERMINATION & PROCEDURE

The number of **NORTHERN STAR SOAP STICKS** to be used is based on the volume of water above the perforations. Field tests indicate that the best results were achieved by using a larger *initial slug treatment of ½ to 1 percent by weight of NORTHERN STAR SOAP STICKS to water above the perforations. A treatment of ½ to 1 percent by weight would require 1.75 to 3.50 lbs. of stick per BBL of water.*

PART NUMBER	STICK SIZES	STICK RATIO INITIAL SLUG TREATMENT
ACL-4550	1 1/4 X 15	2 TO 4 STICKS PER 1 BBL's OF Total Fluid

NOTE:

The above amount is recommended for an initial slug treatment. In many cases, **removing the top few hundred feet of fluid may be sufficient to allow the production of natural gas to blow out the remaining fluid in the well.** To determine the optimum amount for periodic treatments you may choose to gradually reduce the initial treatment amount until the most economical point is reached. Periodic treatments with **NORTHERN STAR SOAP STICKS** may be necessary to prevent production decline due to the gradual water build-up. It is much easier to maintain gas production with regular insertion of **NORTHERN STAR SOAP STICKS** than it is to kick off a dead well. Gas bubbling through water is necessary to create foam. If a well is totally dead, **GAS STICKS™** may be used in conjunction with **NORTHERN STAR SOAP STICKS** to provide agitation energy.

THE MOST COMMON PROCEDURE

Is to shut-in the well and drop sticks through a lubricator. **Wait 45 seconds until sticks contact top of fluid then slowly return well to normal production.** Repeat procedure if or when it becomes necessary. FOR HIGH RATE WELLS (after sticks have contacted the top of fluid) flow well at about 25% of pretreatment rate for about 20 minutes or until foam reaches surface then return to normal rate. **FOR SHALLOW OR LOW RATE WELLS leave well flowing while dropping sticks if possible.**

PRODUCT SPECIFICATIONS

The stick will normally **dissolve in 20 to 80 minutes depending on temperature,** salt content, and relative water motion **NORTHERN STAR SOAP STICKS are 100% soluble in water** and insoluble in oil. The melting point of the sticks is 122°F. The stick will dissolve in water in wells with BHT below 122° (just at a slower rate). Lab tests indicate the dissolving rate in 50,000 PPM moving brine water to be 72 minutes @ 100°, 25 minutes @ 120°, 8 minutes @ 140°, and 3 minutes @ 180°. The dissolving time will decrease if the sticks are broken before dropping or if they break upon impact with the top of the fluid. The specific gravity is 1.11. **The falling rate through fresh water is approximately 100 feet per minute. The sticks can free fall (through air) 3,000 feet in about 15 seconds.** Gas moving up tubing will often change falling characteristics.

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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