



# DG-16

PRODUCT BULLETIN

*DG-16 is a water-soluble stick containing a combination of surfactants and friction reducers. Natural gas bubbling through the water-column, surfactants, and friction reducer produces foam, which can help remove water from watered-up gas wells..*

## Product Uses

DG-16's 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.

DG-16 can be used to remove fluid from gas-condensate wells and flowing oil wells with less than 50% condensate. For gas-condensate wells with more than 50% condensate, it is recommended to use DG-OF sticks.

DG-16's are also used to increase the swabbing efficiency and life of the swabbing cups. The DG-16 contains a very slick friction reducer. The extremely 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 the swabbing action.

DG-16 can also be used in water injection wells in combination with acid sticks to help reduce injection pressures. Surfactants contained in DG-16 can help remove oil coating on scale. This helps the acid sticks to react with the exposed scale.

## Product Advantages

DG-16 provides 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

The number of DG-16's 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 the DG-16 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.

DG-16's Sizes	Sticks per bbl (Initial Slug Treatment)
1 1/4" x 15"*	2-4 Sticks per 1 bbl of H <sub>2</sub> O

\*Other sizes available, please see size chart below

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DG-16 (CONT.)

**NOTE:** *This 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 DG-16 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 DG-16's than it is to kick off a dead well. Gas bubbling through water is necessary to create foam. If a well is totally dead, DG-Gas sticks may be used in conjunction with DG-16's to provide agitation energy.*

## Common Procedures

The most common procedure to add sticks to a well is to shut-in the well and drop sticks through a lubricator. Wait 45 seconds until the sticks contact fluid, then slowly return well to normal production. Repeat procedure if or when it becomes necessary. FOR HIGH RATE WELLS (after sticks have come in contact with the top of fluid) flow well at about 25% of pretreatment rate for about 20 minutes or until foam reaches surface the 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. DG-16's are 100% soluble in water in wells with BHT below 122° (just at a slower rate). Lab test 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. Gas moving up tubing will often change falling characteristics.

## Product Packaging

Texas Size (1 5/8" x 18")	24/Box	48/Chest
Large (1 3/8" x 16")	36/Box	72/Chest
Medium (1 1/4" x 15")	36/Box	72/Chest
Small (1" x 15")	49/Box	108/Chest

Sticks can also be purchased by the drum when applicable. Please ask your sales representative if interested.

**CAUTION:** *Avoid contact with eyes or skin. Wash thoroughly with water. Sticks should be stored in a cool dry place. Always remove sticks from plastic bag or cardboard tube before using. Bag or tube can be used as a glove to avoid contact with hands.*