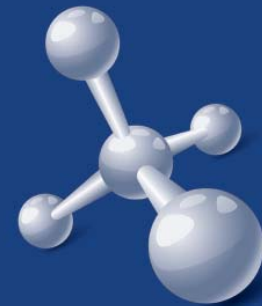


UNOGASsm



WATER-CUT[®] Process for Water Shut-Off in Gas Wells

The Science of Enhanced Oil Recovery

UNOGAS is a patented strategy for placement of gelled polymer into the gas producing zone to shut off water flow without hindering gas production. Long term water control is possible, thus allowing previously suspended well, due to water loading, to once again flow gas. Case history studies show that successful water control can continue longer than three years.

The UNOGAS gel polymer chemistry system is selected to meet the individual well's down-hole environment, which is usually dictated by bottomhole temperatures. TIORCO's polymer and crosslinking reagent systems are capable of producing stable, long lasting gels in temperature regimes exceeding 300°F or 150°C.

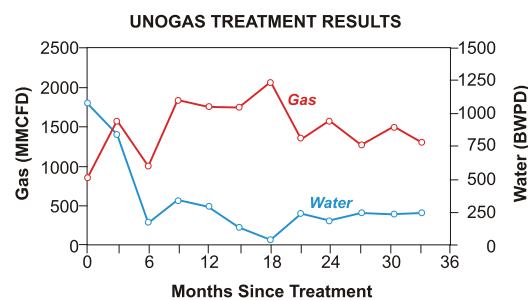
A special gel-alternating-gas placement method selectively places the polymer gel into the high water permeability zones and generates gas flow channels needed for gas production. TIORCO's reservoir engineers study individual well production history to determine the proper chemical formula, treatment size, and placement method.

UNOGAS polymer solutions should be prepared using the POL E DUC[®] dry polymer preparation technology to ensure proper dispersion and hydration of the high molecular weight polymer. The solution can be pumped using typical oil field chemical and additive pump trucks. Nitrogen pumping equipment is required for the alternating gas slug stages.

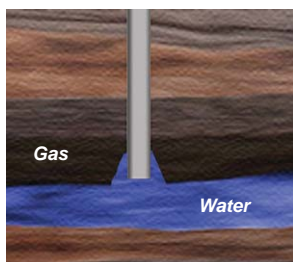
For high temperature applications above 255°F (124°C), the UNOGELsm controllable gelation system is used. UNOGEL gels exhibit a robust, long life, and can be placed in the presence of H₂S, CO₂ and into a wide range of pH environments.

UNOGAS

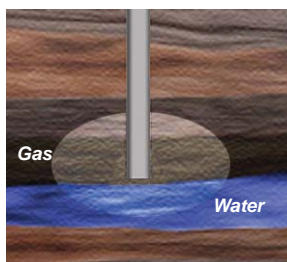
- Polymers
 - WATER-CUT[®] 100
 - WATER-CUT[®] 204
 - WATER-CUT[®] 210C
- Crosslinkers
 - WATER-CUT[®] 644
 - WATER-CUT[®] 684
- Stabilizer
 - WATER-CUT[®] 646



Bottom Water Coning



Frac'ing Out of Zone



Natural Fractures Connected to Bottom Water

