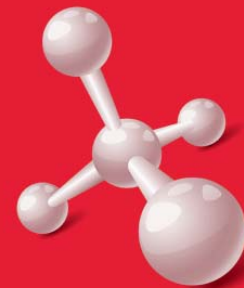


# Solutions

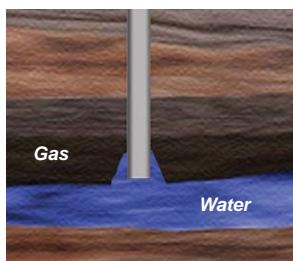


## for water shut-off in gas wells

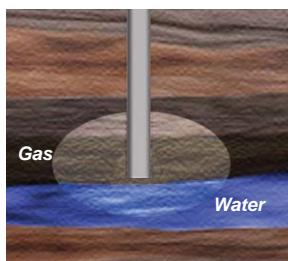
### APPLICATION

The gel is injected into production wells at temperatures up to 300°F. It can solve the following problems:

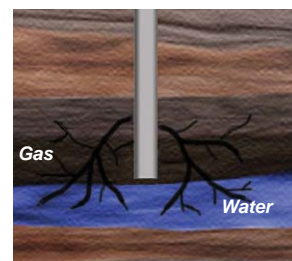
Bottom Water Coning



Frac'ing Out of Zone



Natural Fractures Connected to Bottom Water



### DESCRIPTION

A gel placement technique that allows gel to be placed in water flow paths so that water is shut off without affecting gas. The technology involves gel and gas injection. The gel should be suitable for the temperature and salinity environment of the reservoir and flow path conductivity. For temperatures below 200°F and for higher temperatures, different TIORCO gels have been developed.

### ADVANTAGES

Gel placement in water flow paths is high-graded, so water production is decreased without decreasing gas. This is important because without a proper placement strategy, gel may penetrate water and gas flow paths, shutting off both the unwanted fluid and the desired gas.

- Can be used in almost any type of mix water, but fresh water is best
- May not require zone isolation in fractured reservoirs
- Can place large volumes to block water flow paths further out from the wellbore than other methods. This reduces new flow paths bypassing the gel.
- Works up to 300°F. Can be formulated to work up to 350°F
- Payout is often within 6 to 9 months

### CRITICAL DESIGN FACTORS

- Producers with high fluid levels are excellent candidates
- Wellbore must be clean so the gelant can be readily injected
- Minimum efficient injection rate and maximum injection pressure constrain treatment volumes
- Should be able to place over 50% of design gel volume without reaching pressure limit