

## Stimulation

# OptiKleen-WF™ Viscosity Reducing Agent

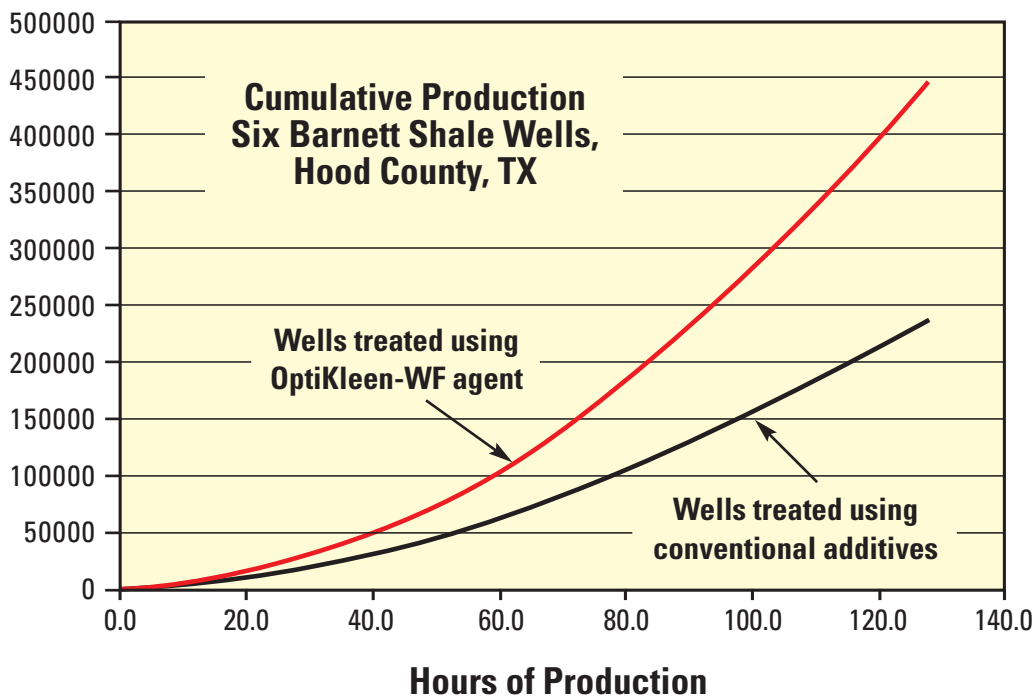
## Helps Prevent Fracture Face Damage For Improved Water Frac Results

In fracturing unconventional gas reservoirs, friction reducers have been shown to cause fracture face damage and have demonstrated damaging effects to fracture conductivity. Proprietary OptiKleen-WF™ viscosity reducing agent has been developed to enhance fluid load recovery and reduce damage that can be created by long chain polymers. It helps return the viscosity of solutions containing treating agents, such as friction reducer, to that of water. It can help maximize the effectiveness of water-fracturing treatments several ways:

- Improves load recovery and productivity.
- Minimizes friction reducer polymer damage.
- Prevents most polymer adsorption to the fracture face.
- Reduces fluid viscosity.

### Applications

OptiKleen-WF agent is a solid material that dissolves in water and can be used in typical water treatment fluids containing friction reducer. OptiKleen-WF agent can be applied in all BHSTs. It is compatible with CO<sub>2</sub> and N<sub>2</sub> but is not compatible with acids. Shut-in time is not required for the OptiKleen-WF agent (although shut-in time may be required for other aspects of the treatment.)



*OptiKleen-WF agent was used in fracture treatments on wells in the Barnett Shale. The three wells treated with OptiKleen-WF agent provided almost twice the cumulative production of the three wells treated using conventional additives.*

## **Advanced Water Frac Technologies**

In addition to OptiKleen-WF agent, Halliburton has recently introduced other new developments focused on improving production from unconventional reservoirs.

### **GasPerm 1000<sup>SM</sup> Service**

New GasPerm 1000<sup>SM</sup> service helps reduce damage due to water imbibition into ultra low permeability formations. In addition, it can replace methanol for water block applications.

### **FR-56<sup>TM</sup> Friction Reducer**

FR-56 agent is a new, patented friction reducer designed to reduce fracture damage created by long chain polymers. It contains no phenols for improved environmental performance.

## **SandWedge<sup>®</sup> Enhancer**

SandWedge enhancer is now available in a special formulation designed for water fracs. It provides improved conductivity and helps control the effects of diagenesis.

### **ShaleStim<sup>SM</sup> Service**

ShaleStim<sup>SM</sup> service is a design and application approach that follows the life cycle of the reservoir and is used to develop shale plays.

**For more information about how OptiKleen-WF agent and other advanced water frac technologies can help make your unconventional gas assets more profitable, contact your local Halliburton representative or email [stimulation@halliburton.com](mailto:stimulation@halliburton.com).**