Keep Your Profits Flowing

Chemical stimulation treatment for fluid-blocked wells

Over time, nearly all natural gas wells reach a point where flow rates are reduced due to the accumulation of condensate, volatile, oil or water blockage. 3M™ Well Stimulant WS-1200, a fluorinated material, is the active ingredient in a treatment used to stimulate fluid flow in these blocked wells or fractures.

The WS-1200 treatment, which was developed by 3M and the University of Texas at Austin, works by changing the wettability of a sandstone formation or silica-based proppant pack. This allows the water or condensate to flow more freely – increasing well production. WS-1200 treatments are potentially more economical, longer lasting and more effective than solvent flush, gas cycling and other conventional methods.

- Laboratory experiments have demonstrated flow rate improvements of 75 – 250%
- Numerous field trials have shown equal or improved performance compared to laboratory experiments
- Can be used to treat matrix or in situ proppants
- Applicable to wells that may not be fracturing candidates

Types of treatable wells:
- Water blocked
- Condensate blocked
- Volatile oil wells
- Dry gas wells
- Fractured wells
Designing a well treatment

3M can work with you to identify solvent blends and develop a treatment suitable for your well conditions. 3M will sell WS-1200 or the fully formulated treatment depending on the customer’s preference.

- Available in 1-gal., 5-gal. and 30-gal. packages
- Leadtime and pricing available upon request

How it works

A solvent blend carries 2 wt% WS-1200 into the well matrix or fracture. The solvent dissolves and displaces the brine and condensate. The WS-1200 stimulant migrates to the matrix or proppant surface, where it attaches. WS-1200 adsorbs as a monolayer to the matrix or proppant with the fluorinated portion oriented outward, and doesn’t restrict pores. By changing the substrate’s wettability, the treatment increases the relative permeability of gas and condensate.

Technical Resources

The following series of technical papers and presentations have been developed on gas-condensate blockage. Contact your 3M representative for details.

- **SPE168086**: A Successful Field Application of a New Chemical Treatment in a Fluid Blocked Well in Saudi Arabia
- **SPE125077**: A Field Demonstration of a New Chemical Formulation Treatment for Fluid Blocked Wells
- **SPE100529**: Improving the Gas and Condensate Relative Permeability Using Chemical Treatments
- **SPE102669**: Chemical Stimulation of Gas/Condensate Reservoirs
- **SPE116711**: A New Solution to Restore Productivity of Gas Wells with Condensate and Water Blocks
- **SPE11648**: Chemical Stimulation of Gas Condensate Wells
- **SPE19599**: Improving Productivity of Hydraulically Fractured Gas Condensate Wells by Chemical Treatment
- **SPE124977**: Development of a Successful Chemical Treatment for Gas Wells with Water and Condensate Blocking Damage

Field trial performance

- Completed onshore or offshore field applications in N. America, S. America, Asia, North Sea, Middle East and Africa
- Increased gas and condensate production post-treatment
- Average immediate improvement: 2.0
- Average 6 months improvement: 1.8
- Reduced or eliminated water production

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