

PropNET

Proppant flowback control technology

APPLICATIONS

- Proppant flowback control in all reservoir conditions
- Oil or gas wells with proppant flowback problems
- Wells with reservoir temperatures from ambient to steamflood conditions

BENEFITS

- Eliminates proppant flowback and related damage to surface equipment
- Increases postfracture production because it
 - Enables aggressive flowback designs that maximize proppant pack cleanup and conductivity
 - Maintains proppant concentration in the critical near-wellbore area
 - Improves conductivity of the proppant pack at low closure stresses (<3,000 psi [20 MPa])
- Significantly improves resistance of proppant packs to closure stress cycling

FEATURES

- Physical mechanism of proppant pack reinforcement for immediate flowback control, eliminating curing time and warmback requirements
- Performance not limited by closure pressure or minimum shut-in time
- Compatibility with common oil- and water-based fracturing fluids and additives, including breakers
- Compatibility with common natural sand and ceramic proppants

PropNET* proppant flowback control technology maintains proppant pack integrity and conductivity after hydraulic fracturing in any reservoir environment. This enables aggressive cleanup, faster well turnaround, lower flowback costs, and reduced time to commercial production.

The newest addition to the PropNET technology family extends the application range of the technology to low-temperature wells and simplifies operations by eliminating the need for temperature activation.

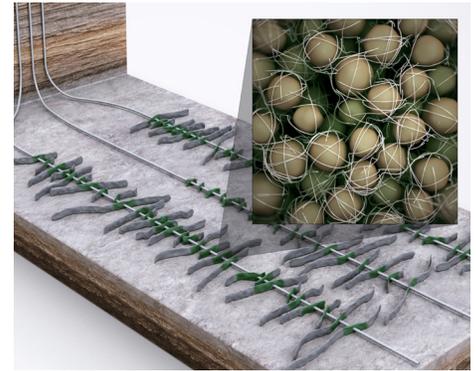
More aggressive flowback makes proppant pack cleanup more effective, increasing production rates through a more highly conductive flow path. With the recent advances in technology development, PropNET technology is being used in the most severe well environments, yielding high proppant pack strength and conductivity, even with the largest proppant sizes in the industry.

Conductivity improvement

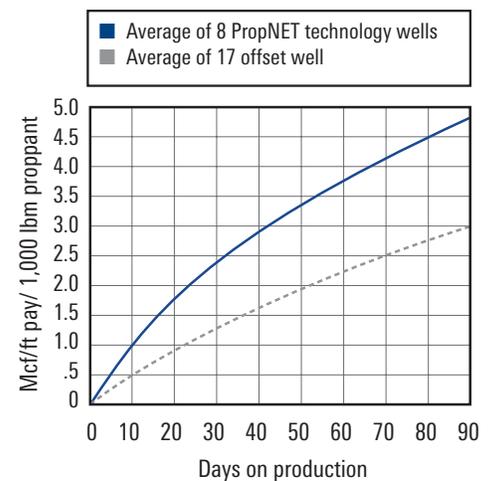
The technology also disrupts the close-order packing of the proppant, promoting better flow through the proppant pack. Testing in an independent laboratory confirmed that PropNET technology can significantly increase proppant pack conductivity at low closure stresses (less than 3,000 psi [20 MPa]).

As much as a 50% increase over the base proppant conductivity has been measured with 16/20 ceramic proppant at 1,000-psi [7-MPa] closure stress.

A comparison of PropNET technology versus an intermediate-strength resin-coated proppant (RCP) system with comparable crush resistance and cost at high temperature and high closure stress shows that the PropNET technology gives equivalent or higher permeability.



PropNET proppant flowback control technology keeps proppant in the fracture, enabling aggressive cleanup and reducing time to commercial production.



The 90-day cumulative production of wells treated with PropNET technology is significantly greater than production from offset wells.

Productivity enhancement

PropNET technology facilitates aggressive flowback and choke schedules, which can lead to productivity enhancement.

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Results in the Denver-Julesburg Basin of northeastern Colorado demonstrate that the aggressive flowback schedules enabled by PropNet technology significantly increased load recovery, resulting in 40% to 50% higher gas and condensate production compared with nearby wells completed without PropNET technology — which also produced significant volumes of proppant under less intense flowback schedules.

Friction pressure reduction

Adding PropNET technology to proppant slurries also has been seen to significantly decrease treating pressure because it inhibits turbulent flow in the tubular boundary layer (flow path closest to the pipe or tubing wall). The magnitude of the pressure reduction depends on several factors, including tubing diameter, pump rate, and proppant concentration. In six wells stimulated with one PropNET technology, treating pressure was reduced by as much as 84 psi/1,000 ft.

PropNET Technology Specifications

System or Application	J501	J502	J679/J680
Maximum temperature, degF [degC]	300 [149]	450 [232]	200 [93]
Lifetime >2 years	no	yes	yes
Applicable in carbonate formations	no	yes	yes
Resistant to nonsilica-saturated water (e.g., injected seawater)	no	yes	yes
Resistant to hydrochloric acid (HCl)	yes	yes	yes
Resistant to mud acid	no	yes	yes
Maximizes proppant pack stability	no	yes	yes
Maximizes proppant pack permeability	no	yes	yes

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