NeutraProp LWC neutral-wettability proppant

Improve post-frac cleanup for enhanced conductivity

Making fractures more efficient is a perennial concern for operators. One of the longstanding challenges has been keeping the fractures open over time and increasing hydrocarbon flow through existing fracture networks.

Though proppant is often used to accomplish these goals, the surface of traditional proppant is highly water-wet, trapping water or water-based fluids in the pore spaces between particles during treatment, reducing conductivity and permeability, choking off hydrocarbon flow.

The **NeutraProp™ lightweight ceramic (LWC) neutral-wettability proppant** is a surface-modified proppant that enables fluids to flow freely through the pore spaces in a proppant pack. Rather than trapping fluids in the proppant pore space and slowing production, the NeutraProp LWC proppant surface is modified to repel fluids— accelerating flow and enabling low pressure wells to be stimulated and produced more efficiently. In tight pore spaces, it can prevent the water blockages to which other proppants are susceptible and increase the relative permeability to hydrocarbons.

Safety Precautions

Refer to the safety data sheets (SDS) for additional handling, transport, environmental, and first aid information.

References

Safety Data Sheets (SDS)

Applications

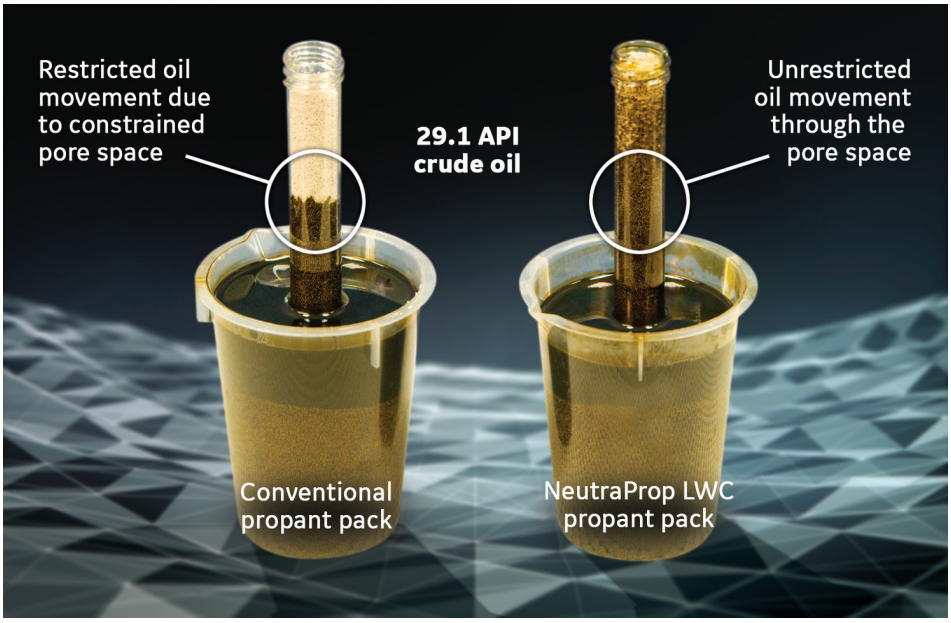
- Conventional frac pack and gravel pack operations
- Hydraulic fracturing of unconventional oil and gas wells, including wells in tight sand and shale formations

Benefits

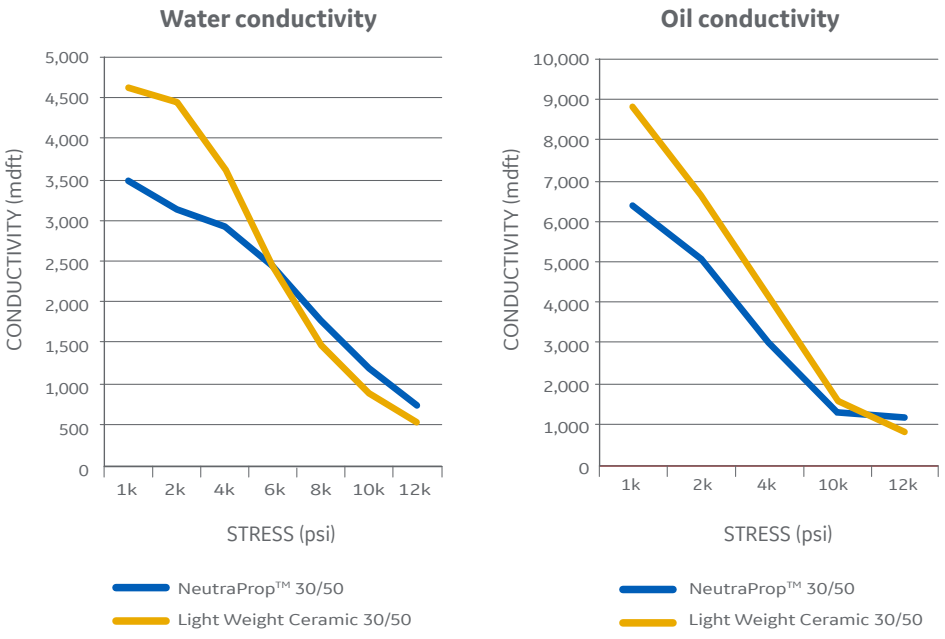
- Produces neutral wettability neither oil-wet nor water-wet
- Enables unrestricted fluid flow through the proppant pack
- Improves cleanup of proppant pack to enhance production rate
- Increases conductivity and permeability, enhancing hydrocarbon flow
- Functions in a wide range of downhole environments

Technical data

Typical properties of NeutraProp LWC vs. Conventional LWC								
	Conventional LWC 30/50	NeutraProp LWC 30/50	Conventional LWC 20/40	NeutraProp LWC 20/40	Conventional ISP 30/50	NeutraProp ISP 30/50	Conventional HD 25	NeutraProp HD 25
Loss on ignition	<0.5%	<0.5%	<0.5%	<0.5%	<0.5%	<0.5%	<0.5%	<0.5%
Crush resistance (fines at 10,000 psi)	4.9%	3.0%	12.5%	7.1%				
Crush resistance (fines at 7,500 psi)	1.7%	1.5%	4.6%	1.6%				
Crush resistance (fines at 12,500 psi)					2.8%	2.2%		
Crush resistance (fines at 20,000 psi)							3.9%	1.8%
Acid solubility in 12:3 HCl:HF, 150°F (66°C)	2.1%	2.4%	1.6%	1.9%	1.4%	1.7%	1.6%	2.0%
Turbidity	66 FTU	8 FTU	39 FTU	4 FTU	92 FTU	3 FTU	23 FTU	4 FTU
Bulk density	1.59 g/cm^3	1.58g/cm^3	1.55g/cm^3	1.55 g/cm^3	1.89 g/cm^3	1.90 g/cm^3	2.06 g/cm^3	2.06 g/cm^3
Apparent density	2.73 g/cm^3	2.69 g/cm^3	2.68 g/cmv	2.64 g/cm^3	3.28 g/cm^3	3.25 g/cm^3	3.42 g/cm^3	3.41 g/cm^3
Sphericity and roundness	8.5/8.3	8.1/8.0	8.1/8.1	8.2/8.2	0.85/0.84	0.81/0.82	0.87/0.89	0.87/0.89
Particle size (between designated mesh)	93.1%	92.7%	94.7%	94.7%	96.3%	97.3%	98.6%	98.1%
Particle size smaller than designated stack	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.01%	0.0%
Particle size larger than designated stack	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D50	520 um	520 um	728 um	726 um	496 um	493 um	775 um	775 um



Lab testing demonstrates how conventional, untreated proppant can trap fluids in the particle pore spaces while NeutraProp LWC surface-modified proppant allows fluids to flow freely through the proppant pack.



Typical conductivity to water (left) and conductivity to oil (right) for NeutraProp LWC compared to the control at 250°F and for a loading of 2 lb/sqft.

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