OpenFRAC

Family of fluid additive systems

APPLICATIONS

- Hydraulic fracturing operations, including those in stiff, naturally fractured, low-permeability formations such as shale and tight gas sands

BENEFITS

- Ability to recycle and reuse water

- Drag reduction, improving efficiency and reducing costs

- Organic matter treatment in water

FEATURES

- Fully disclosed fluid additives

- Effective hydraulic fracturing formulations

- Solid performance using a wide range of produced or recycled waters

- Three separate additive systems for crosslink gel, linear gel, and slickwater applications

- Optional components for scale inhibition, load-water recovery, and formation stabilization

Resulting from an extensive development and testing program, the OpenFRAC* family of hydraulic fracturing additive systems assures high performance. Operators receive full disclosure of additive components, a disclosure level similar to that used in the food industry.
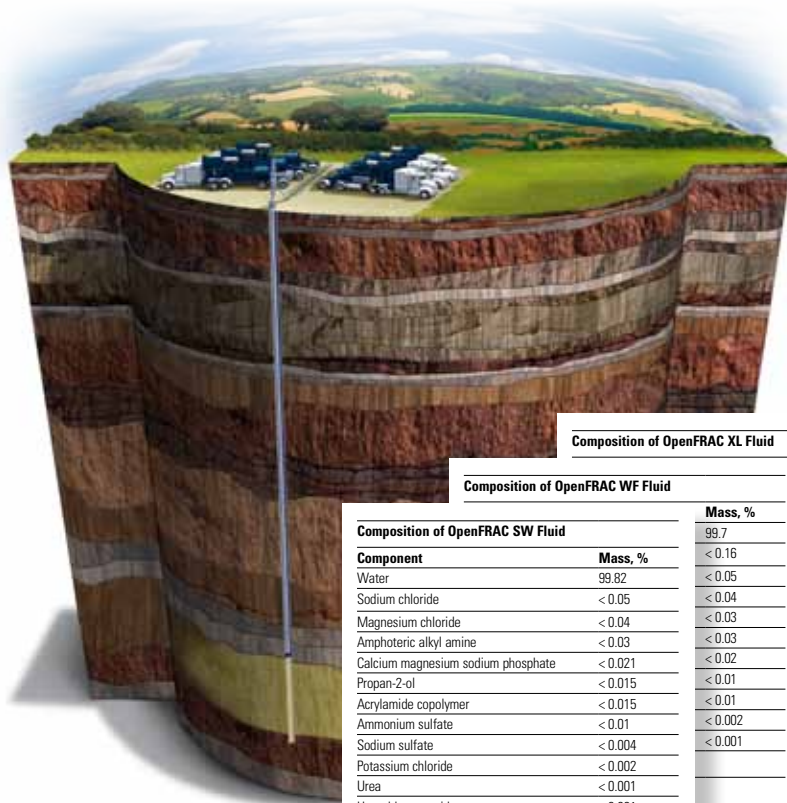
Fluid options

Several formulations of OpenFRAC systems are available, addressing:

- crosslink gel

- linear gel

- slickwater.

All are water-base, viscosified fluids comprising effective components that function in a wide range of mix-water compositions, and all are well suited for recycling and reuse. Optional additives inhibit mineral scale formation, promote load-water recovery and cleanup, and stabilize clays in the formation.

OpenFRAC SW formulation is used for slickwater fracturing, where drag reduction and less-complex fluid systems are desired. OpenFRAC WF fluid is the linear gel variant, offering improved proppant transport characteristics. And for crosslinking, OpenFRAC XL fluid not only maintains all the advantages of the aforementioned fluids, but also creates wider fractures to enable high proppant concentrations and generate high fracture conductivity.

Composition of OpenFRAC XL Fluid

	Mass, %
	99.57
	< 0.16
	< 0.08
	< 0.06
	< 0.05
	< 0.04
	< 0.03
	< 0.03
	< 0.02
	< 0.02
	< 0.01
	< 0.002
	< 0.001

Composition of OpenFRAC WF Fluid

	Mass, %
	99.7
	< 0.16
	< 0.05
	< 0.04
	< 0.03
	< 0.03
	< 0.02
	< 0.01
	< 0.01
	< 0.002
	< 0.001

Composition of OpenFRAC SW Fluid

Component	Mass, %
Water	99.82
Sodium chloride	< 0.05
Magnesium chloride	< 0.04
Amphoteric alkyl amine	< 0.03
Calcium magnesium sodium phosphate	< 0.021
Propan-2-ol	< 0.015
Acrylamide copolymer	< 0.015
Ammonium sulfate	< 0.01
Sodium sulfate	< 0.004
Potassium chloride	< 0.002
Urea	< 0.001
Hypochlorous acid	< 0.001
Noncrystalline silica	< 0.0005

As part of the Schlumberger hydraulic fracturing portfolio, the OpenFRAC full-disclosure fracturing additive systems assure high performance for a range of applications.

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Features and Advantages of OpenFRAC Fluids

Fluid Name	Drag Reduction	Organic Matter Treatment in Water	Scale Inhibition	Cleanup	Clay Stabilizer	Nonfreshwater	Proppant Transport	Fracture Width
OpenFRAC SW	X	X	Optional	Optional	Optional	X		
OpenFRAC WF	X	X	Optional	Optional	Optional		X	
OpenFRAC XL	X	X	Optional	Optional	Optional		X	X

Composition of OpenFRAC Fluids

OpenFRAC SW	Mass, %	OpenFRAC WF	Mass, %	OpenFRAC XL	Mass, %
Water	99.82	Water	99.7	Water	99.57
Sodium chloride	< 0.05	Guar gum	< 0.16	Guar gum	< 0.16
Magnesium chloride	< 0.04	Sodium chloride	< 0.05	Boric acid	< 0.08
Amphoteric alkyl amine	< 0.03	Magnesium chloride	< 0.04	Sodium hydroxide	< 0.06
Calcium magnesium sodium phosphate	< 0.021	Amphoteric alkyl amine	< 0.03	Sodium chloride	< 0.05
Propan-2-ol	< 0.015	Calcium magnesium sodium phosphate	< 0.03	Magnesium chloride	< 0.04
Acrylamide copolymer	< 0.015	Propan-2-ol	< 0.02	Amphoteric alkyl amine	< 0.03
Ammonium sulfate	< 0.01	Calcium chloride	< 0.01	Calcium magnesium sodium phosphate	< 0.03
Sodium sulfate	< 0.004	Potassium chloride	< 0.01	Propan-2-ol	< 0.02
Potassium chloride	< 0.002	Noncrystalline silica	< 0.002	Potassium chloride	< 0.02
Urea	< 0.001	Hemicellulase enzyme	< 0.001	Calcium chloride	< 0.01
Hypochlorous acid	< 0.001	Hypochlorous acid	< 0.001	Hypochlorous acid	< 0.001
Noncrystalline silica	< 0.0005			Noncrystalline silica	< 0.002
Dimethyl siloxanes and silicones	< 0.0001			Hemicellulase enzyme	< 0.001

www.slb.com/OpenFRAC

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