

FightR® and Excelerate® Dry Friction Reducer Portfolio

DRY FRICTION REDUCER CHEMISTRY FOR UNCONVENTIONAL STIMULATION APPLICATIONS

OVERVIEW

In addition to liquid friction reducers (FRs), the FightR® portfolio includes dry high viscosity friction reducers (D-HVFR), while the Excelerate® line includes dry options, engineered for a wide range of water quality. Both are designed to address common problems with conventional fluid selection for fracture treatment without compromising the efficiency and economics of fracture design. This includes managing poor performance in produced water with varying rates of Total Dissolved Solids (TDS), controlling aggressive proppant/sand ramps, which conventional fluid FRs are challenged to correct, and minimizing formation damage in iron-rich fields.

SOLUTIONS

Through the combined benefits of viscosity and elasticity, the FightR portfolio provides operators options to manage more challenging types of frac treatments. FightR FRs specifically improve proppant transport, potentially allowing operators to place a targeted volume of proppant deeper into the reservoir than a conventional liquid-based friction reducer, while Excelerate FRs provide effective treatment at low concentrations and across a low to high range of TDS.

- » **FightR® HSD Friction Reducers | Fresh and Produced Water:**
An effective FR in fresh and produced water (i.e., up to 100,000 ppm TDS) with the viscosity needed for lower TDS levels
- » **FightR® LXD and ECD Friction Reducers | Fresh Water:**
Provides friction reduction and improves conductivity in fresh water by enhancing suspension and transport regardless of the size of proppant, sand loads, and proppant ramping, which helps improve proppant suspension to reach farther into the reservoir
- » **Excelerate® Friction Reducers | Fresh and Produced Water:**
FRs with multiple benefits over a range of TDS, including minimal impact to formation and the viscosity needed for higher loadings through crosslinking

KEY BENEFITS

- » High friction reduction performance in fresh and produced water
- » Improved logistics, storage, economic and environmental benefits, including:
 - » Fewer trucks on road and location
 - » Lower fuel consumption
- » Stronger elasticity properties compared to guar
- » Provides excellent proppant transport
- » On-the-fly changes to viscosity, allowing for a hybrid pumping schedule
- » Successful applications across multiple geographies, including:
 - » Multiple U.S. basins
 - » Canada
 - » Latin America
 - » Australia
- » Supported by patent pending pumping method developed (first in industry)



PRODUCT OVERVIEWS

FightR® HSD Friction Reducers

Friction Reduction in Elevated TDS Water | Viscosity/Elasticity in low TDS

Features

- » Friction reduction over a broad range of TDS up to 100,000 ppm
- » Viscosity/elasticity at a low TDS

Key Benefits

- » Enable use of multiple water sources during a treatment
- » Provide viscosity and friction reduction as needed by tailoring water chemistry

FightR® LXD and ECD Friction Reducers

Friction Reduction and Superior Viscosity in Fresh Water

Features

- » Friction reduction up to 20,000 ppm TDS
- » Superior viscosity to enhance proppant transport in fresh water

Key Benefits

- » Excellent friction performance at reduced concentrations
- » Elasticity of material boosts proppant suspension

Excelerate® DX-4 Friction Reducers

Friction Reduction

Features

- » Friction reduction in waters up to 50,000 ppm TDS

Key Benefit

- » Economic option

Excelerate® DX-5

Resolves Formation Incompatibilities

Features

- » Friction reduction in waters up to 250,000 ppm TDS
- » Viscosity-capable in high TDS
- » Compatible with iron

Key Benefits

- » Does not create elastic solid materials from in-situ iron
- » Ability to place higher proppant loadings in variable TDS water

What is the right friction reducer for your operations?

Feature	FightR® HSD	FightR® LXD and ECD	Excelerate® DX-4	Excelerate® DX-5
Fresh Water	✓	✓	✓	✓
Produced Water	✓	—	✓	✓
TDS Range (ppm) for Friction Reduction	0 - 100,000	0 - 20,000	0 - 50,000	0 - 250,000
TDS Range for Viscosity (ppm)	0 - 2,000	0 - 2,000	—	0 - 250,000
Elasticity	✓	✓	—	✓*
Iron Compatibility	—	—	—	✓

* Possible with crosslinking

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com/multichem

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