



ECI FloSolv

Introducing **FloSolv** – ECI's next generation pipeline drag reducing agent (DRA) formulated to address specific limitations with current generation DRA products.

FloSolv is a completely refinable blend of liquid chemicals, formulated to reduce pipeline turbulence and coat the inside of pipelines, pumps, and other attached equipment to prevent chemical buildup.

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Who is ECI?

- Formed in 2020 to develop unique chemical solutions for the Oil and Gas Industry, specifically targeting midstream and downstream operational issues
- Our DRA and tank cleaning products currently account for 100% of our efforts
- Efficient team with over 100 years of experience
- Able to customize solutions based on customer needs and desired solutions (not a one size fits all)
- Partnered with large, International chemical companies as both suppliers and blenders, worldwide.

Drag Reducing Agents (DRAs)

- Flow rate improvements
- Power optimization
- Bypassing of intermediate pumping stations
- Batch management
- Reduction of scheduled maintenance
- Shortened barge download time
- Peak shaving
- Operating pressure reduction

DRA history

- Originally created in 70's by Conoco
- Crude and other liquids create turbulence as product flows under pressure through pipe turns
- When mixed into a liquid system, DRAs reduce turbulence and fluid friction on the inner pipe walls.
- Benefits provided by most current-generation DRAs
 - Increase flow rate
 - Reduce pipeline pressure
 - Reduce pumping energy

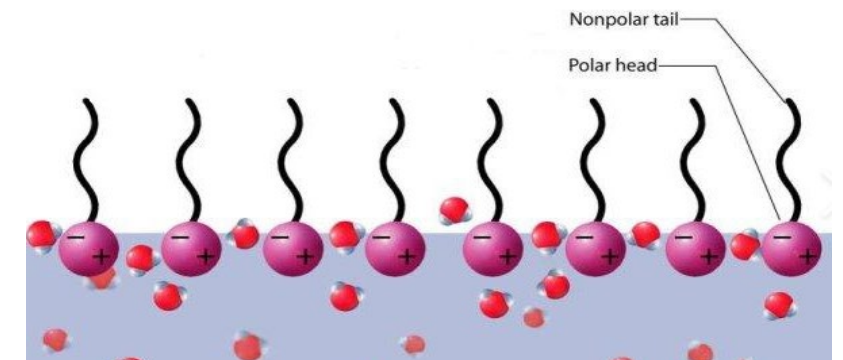
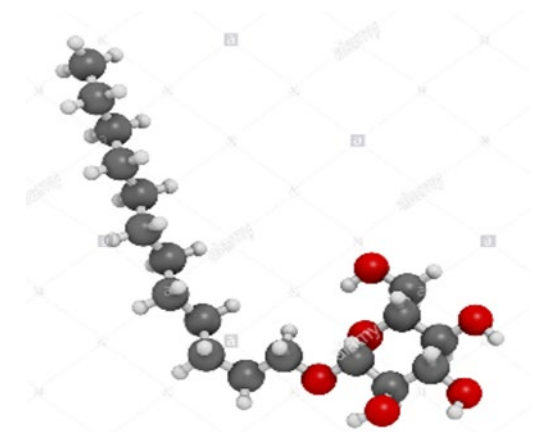
Issues with current generation DRAs

- **Not shear stable.** Molecules tear from turbulence when these products flow through each boost pump and valve ... requires reinjection of DRA at each pumping station
- **Not oil soluble.** Current generation DRAs separate in solution, requiring constant mixing and temperature control
- **Require constant mixing** prior to injection in order to retain suspension of polymers
- **Injection skids are complex.** Require 240-volt which is expensive to operate and maintain
- **Require heating** because of high solidification temperature
- **Do not clean pipeline or boost pumps** ... impervious to resins, waxes, paraffins and asphaltenes resulting in pipeline maintenance and downtime on all components in the system

ECI's FloSolv is a next generation DRA

Eases Turbulence and Promotes Laminar Flow helping to reduce the pressure within the pipe.

- Organic blend of hydrocarbon-based polymer and surfactant compounds with strong dissolving solvents. (true challenge)
- Amphiphilic properties
- Easily mixed with a crude liquid system – the combination of oil soluble polymers and surfactants created form a system reducing turbulence and fluid friction on the pipe walls
- Contains organic solvents which help reduce internal paraffin and asphaltene formation and build up
- Requires no separation prior to refining



FloSolv unique features & benefits

- **Shear stable** ... fewer injection points
- **Reduces drag & turbulence, lowers pipeline pressure**, increases flow efficiency by 80%
- **Product remains in solution** ... no blending tanks required
- **Product remains liquid, even at -20 F (-29 C)** ... no heaters required
- **Injection skids are simple, compact and utilize 120-volt power** ... which can even be produced from solar panels in remote locations
- **Liquifies emulsions, waxes, paraffins and asphaltenes on the inside of pipelines, pumping stations and other pipeline components** ... significantly reducing pipeline maintenance on all components in the system



Comparison – current generation vs. FloSolv

Current generation DRA products

- Long chain polymers require separation before refining, do not dissolve paraffins
- Settles in tanks ... requires large circulation tanks to keep in suspension before injection into pipeline
- Molecules shear as they move through pumps, requiring injection of additional product
- Difficult to inject – high viscosity means special equipment required, low temp concerns, hard to transfer

FloSolv – Next generation DRA product

- Organic hydrocarbons dissolve paraffin and do not need to be separated before refining
- Does not settle in tanks - can be injected directly into pipeline from the shipping containers
- Shear stable ... if shearing occurs, molecules reassemble. Much less product required (1 injection point is sufficient for miles of pipe flow)
- Easy to inject - no special handling equipment needed, no low temp concerns, easily transferred



Thank you

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