

HITECH FLUID SYSTEMS

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www.hitechfluid.com

Aphron ICS™ Fluid Technology

The Aphron Fluid System is very different from other surfactant and micellar based fluid technologies. The technology design involves dynamic, multiple phase flow that controls whole fluid, filtrate, and solids invasion into your reservoir.

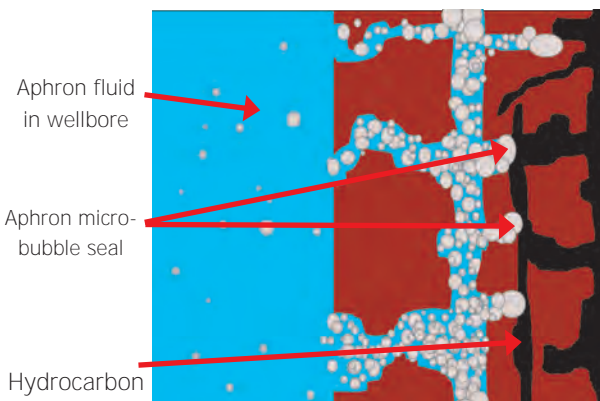
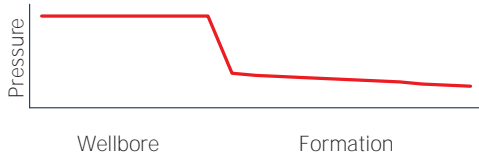
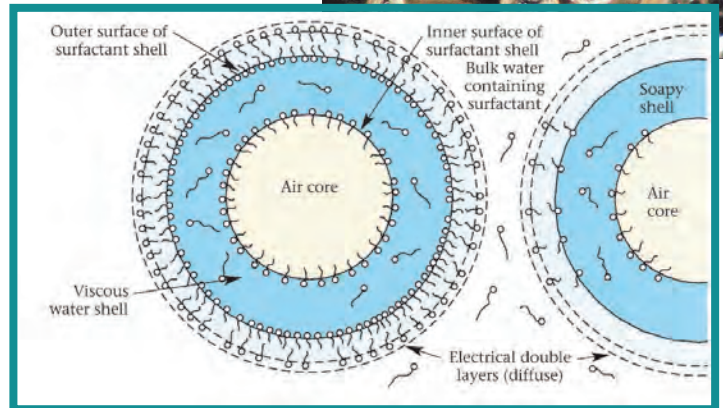
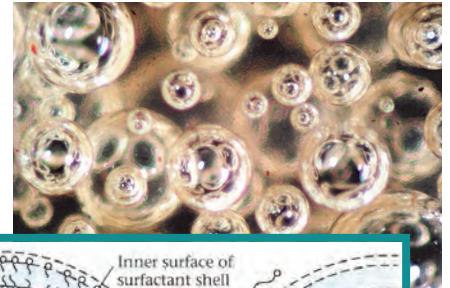
The co-polymers and surfactants package (or "Aphrons") in the Aphron Fluid System provides the fluid with very unique properties, not the least of which is the ability of this fluid technology to deliver solids-free invasion control, which is a key differentiator of the Aphron Fluid System.

Elements of the System

Aphron's are surfactant-stabilized multi-phase structures that resemble conventional bubbles. They comprise of two (2) fundamental elements:

1. A gas core that is commonly but not always spherical
2. A thin aqueous protective shell with an outer hydrophobic covering

The encapsulating shell protects the Aphrons which can attract one another to build up complex aggregates



When the bit enters a low-pressure zone, the energized Aphrons aggregate instantaneously within the formation, creating a microenvironment bridge, preventing invasion of whole drilling fluid, filtrate and solids.

Applications for Aphron ICS™ Fluid Technology

Applications of the System

- ✓ Drilling depleted zones coexisting with normally pressured formations
- ✓ Any geology characterized by porous sands (Limestone, Dolomite, Carbonate or Coal)
- ✓ Any geology characterized by laminated sequences of sand and shale
- ✓ Areas where lost circulation material has proven ineffective in controlling fluid losses
- ✓ High angle/horizontal wells
- ✓ Alternative to Underbalanced drilling
- ✓ Cement pre-flush

Drilling

- Depleted reservoirs
- High Porosity
- Underbalanced/at-balance drilling
- High-angle/horizontal wells
- Depleted formations coexisting with normally pressured formations

Workover

- Fishing Operations
- Vent Leaks
- Perforating
- Testing Lower/Upper zones of interest
- Remove & Replace packers
- Milling operations
- Hole Clean out (Mechanical bailing alternative)

Formation Extreme's

	Formation Pressure	Temperature	Depth	H2S Content
High	44.59 mPa (1,510 kg/m ³ , 12.6 lbs/gal)	162°C (325 °F) Tested to 185 °C (365 °F)	4,046 mMD (13,274 ft) 3,646 mTDV (11,962 ft)	6.8 %
Low	360 kg/m ³ equivalent (3.0 lbs/gal)			

Locations & Formations Utilized

Locations drilled with Aphron

Our Aphron ICS Fluid System has been successfully utilized on over 400 wells worldwide.



Canadian Strike Areas

Aberfeldy	Dawson	Lashburn	Pikes Peak
Atlee	Denzel	Leismer	Pine Creek
Auburn	Dodsland	Leo	Portage
Baldwinton	Drumheller	Lindbergh	Red Earth
Beaverlodge	Dunvegan	Lloydminster	Redwater
Belloy	Edam	Lynx	Resthaven
Big Gully	Edson	Manito Lake	Royce
Bolney	Ewing Lake	Markerville	Rush Lake
Brazeau	Fenn West	Marsden	Smokey
Bubbles	Ferrier	McLeod	Sojer
Buick	Fir	Medicine River	Storthoaks
Cabin Creek	Frog Lake	Mervin	Sylvan Lake
Cecelia	Hay River	Moncton, NB	Tangleflaggs
Cecil	Hussar	Narraway	Turtle Lake
Celtic	Huxley	Northminster	Valhalla
Chickadee	Innes	Obed	Wapiti
Chinchaga	Innisfail	Ojay	Westhazel
Commotion	Kakwa	Peoria	Wild River
Cordel	Kirby	Princess	Wildmere

Formations drilled with Aphron

Carbonates Limestone Dolomite CBM Heavy Oil / Oil Sand

Canadian Formations

Alida	Duperow	Mannville
Aquifer	Falher	Mannville Coal
Baldonel	General Petroleum	McLaren
Banff	Gething	Mikwan Coal
Cadotte	Glauconite	Pekisko
Colony	Grand Rapids	Rex
Cummings	Granite Wash	Royce
Dina	Grosmont	Slave Point
Doig	Hirambrook	Sparky
Dunvegan	Leduc	Viking
	Lloydminster	Wabamun

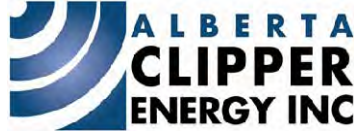
Global Strike Areas

Angola (off-shore)
Australia
Mexico
Venezuela
Yemen

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Aphron ICS™ Fluid Customers



BUFFALO RESOURCES CORP.



Korea National Oil Corporation



MEG Energy Corp.



TALISMAN

E N E R G Y

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Features & Benefits of Aphron ICS™ Fluid Technology

Features of the System

- ✓ Tough Stable microbubbles
- ✓ High LSRV (low shear rate viscosity)
- ✓ Reduces the effects of high pressure differentials
- ✓ Excellent cuttings transport
- ✓ Can be used in low pressure environments

Benefits of the System

- ✓ Improve drilling efficiency
- ✓ Easier drilling in high angle and horizontal wells
- ✓ Reduces lost circulation and risk of stuck pipe
- ✓ Improved field economics
- ✓ Improves log data quality due to excellent condition of wellbore
- ✓ Improves cement bonds

Additional Information

If you would like to know more about the Aphron System and how it's performed on hundreds of wells for our customers, please contact HiTech Fluid Systems Ltd.



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