TenEx Technologies develops proprietary, materials-based technology solutions for the oil & gas industry. TenEx focuses on generating the lowest cost per barrel of oil using innovative and cost-effective products that can be tailored for every reservoir.

NANOCLEAR®

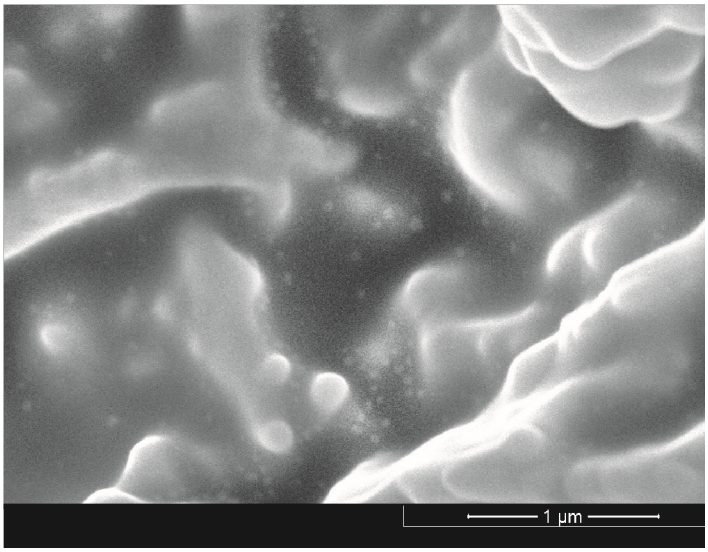
NanoClear® is a patent-pending solution of nanoparticles designed to increase oil recovery

What is NanoClear® and how does it work?

NanoClear® is a water-based solution of nanoparticles that alters the wettability of the formation to increase oil production.

NanoClear® contains nanoparticles which are 10-30 nm in size, and which can penetrate natural and induced fractures where traditional proppants do not reach. Shown here under Scanning Electron Microscope are NanoClear®'s nanoparticles coating the inside of a core, which reflects the nanoparticles' ability to alter wettability.

NanoClear® is also effective at removing organic build-up in producing wells, representing a long-lasting and less damaging treatment alternative to acid.

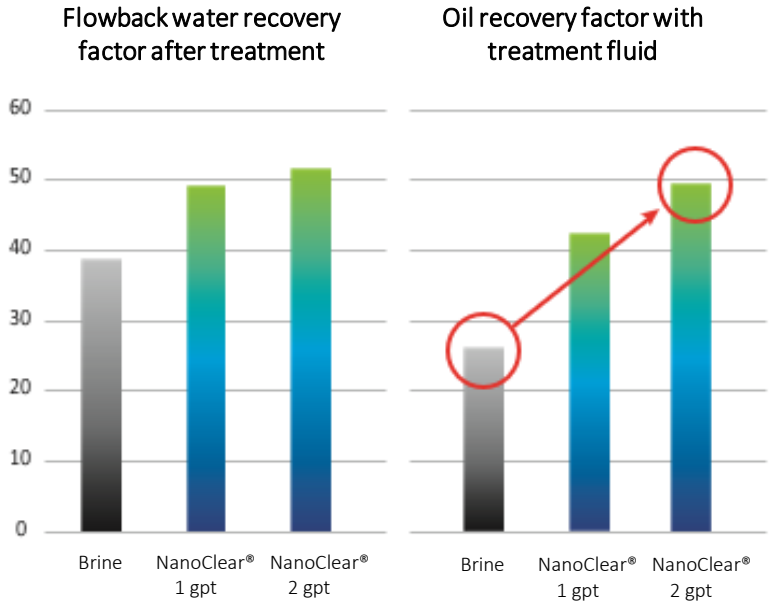


SEM image of NanoClear® nanoparticles coating the inside of a core

NanoClear®'s impact on improving oil recovery

Core flood testing shows the effectiveness of NanoClear® in enhancing water flowback and increasing oil recovery.

- NanoClear® can effectively sweep pre spaces in the core mobilizing the oil, thereby resulting in higher oil recovery.
- Core-flood oil recovery is more than 80% higher when treated with NanoClear®.
- NanoClear® reduces interfacial tension between oil and water and helps early flowback.
- Core-flood water flowback is more than 30% higher after treatment with NanoClear®.



NANOCLEAR®

Wettability Alteration

Contact Angle

Contact Angle testing has been completed on various cores. Figure 1 shows the contact angle between water droplet and oil-covered Eagle Ford Shale rock. The presence of NanoClear® reduces contact angle by 22%.

In comparison testing, NanoClear® has a reduction of 16% in contact angle vs. traditional nanofluid, which demonstrates its higher performance in wettability alteration.

Imbibition Testing

Static testing, shown in Figure 2, shows NanoClear®'s effectiveness in removing oil from sandstone. Similarly, Amott Tests show 18% oil recovery improvement with NanoClear®.

Interfacial Tension (IFT)

Interfacial Tension (IFT) measurement between Texas crude oil and different aqueous phases shows that NanoClear® reduces IFT by 91% (as in Figure 3). In addition, NanoClear® has a 49% reduction in IFT compared to traditional nonfluid demonstrating NanoClear®'s higher performance.

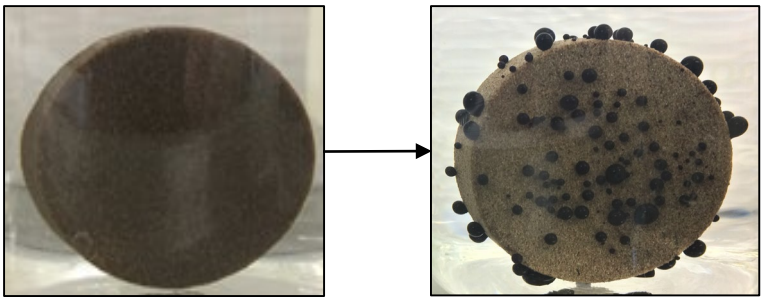
De-Emulsification

Tests were conducted to evaluate de-emulsification capability of NanoClear®.
As shown in Figure 4, NanoClear® provides a more effective separation of oil and water with a more distinct interface and higher clarity resulting from a more efficient phase separation.

FIGURE 1

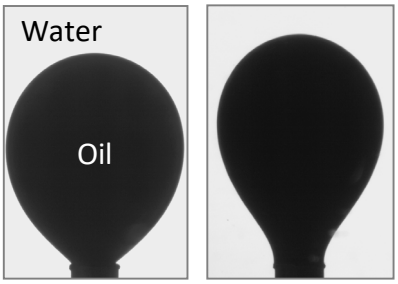
Without NanoClear® **With NanoClear®**

FIGURE 2



Spontaneous Imbibition Test showing oil recovery with NanoClear®

FIGURE 3



Oil droplet in water (left); with addition of NanoClear® (right)

FIGURE 4

Oil and water emulsion (left); With addition of NanoClear® (right)

TenEx Technologies develops specialty chemicals that reduce your cost per barrel.

For more information, please contact us at: sales@tenextechnologies.com or 484-324-1316

TenEx Technologies, LLC
HQ: 18 Station Avenue
Berwyn, PA 19312
Sales: Midland, Denver, Calgary & Houston

www.PumpMoreOil.com

TENEX