



PRODUCTIVE INNOVATION

Enhancing Well Performance

An Environmentally Friendly Fluid System

The oil and gas industry has been challenged for decades by high risks, operational inefficiencies, rising costs, and environmental concerns. As a result, enhancing the production of crude oil and natural gas has created significant technical, ecological, and financial challenges.

Shotwell has developed a chemical treatment innovation that offers a significant improvement in how these problems can be addressed. The use of this fluid system can improve operator safety, lower environmental and economic risks, reduce operating costs, and improve operational efficiency. All this translates into increased revenue and profits.



INDUSTRY OPPORTUNITIES FOR SHOTWELL'S ECO-FRIENDLY FLUID SYSTEM

We provide technically advanced and environmentally responsible chemicals to the oil and gas industry. In an industry that is placing a greater emphasis on health and safety, Shotwell's products are preferred.

Shotwell's new, environmentally friendly, hydraulic fracturing technologies are being introduced with the unique ability to outperform other solutions in maximizing initial production, maintaining those rates to extend the total life cycle of the well, and improving profitability.

Our emerging technologies are both environmentally friendly and profitable. Shotwell's goal is to help customers extract more oil while maximizing sustainability, cost-effectively, without sacrificing performance and profit.

We maximize ESG compliance by reducing the carbon footprint of operations and providing treatments with low acute toxicity that are safe for handling and the environment. Shotwell is continually developing new, differentiated products while always maintaining the most current regulatory requirements.

Shotwell understands the complexities and challenges involved in developing oil & gas fields, and we offer an evolving portfolio of environmentally friendly chemistries, additives, and custom solutions – coupled with in-depth technical expertise – to address many of the issues service companies face.



EXPLORATION & PRODUCTION

INCREASED VOLUMES

Improves fracture effectiveness and overall well performance by lowering surface and interfacial tension of the oil and treatment fluid.



ENVIRONMENTALLY CONSCIOUS

PROTECT YOUR PEOPLE, YOUR ASSETS & THE ENVIRONMENT

Shotwell's products are environmentally friendly and significantly reduce the environmental footprint of energy production. Our chemicals are not only safer for our ecosystem and workers, but also optimize well productivity.



COMPLIANCE

SAFER PRODUCTS = RISK MITIGATION

NSF approved system, lower toxicity, and reduced chemical footprint.



INTRODUCING ECO-FRIENDLY INNOVATION

As part of our ongoing commitment to sustainability, Shotwell offers a range of chemistries to help customers stimulate, produce, and process their shale assets in ways that protect both their bottom line and the environment. Our product formulations are continually evaluated in order to provide the safest products while ensuring that they perform at a cost-competitive level.

SHGA-9700

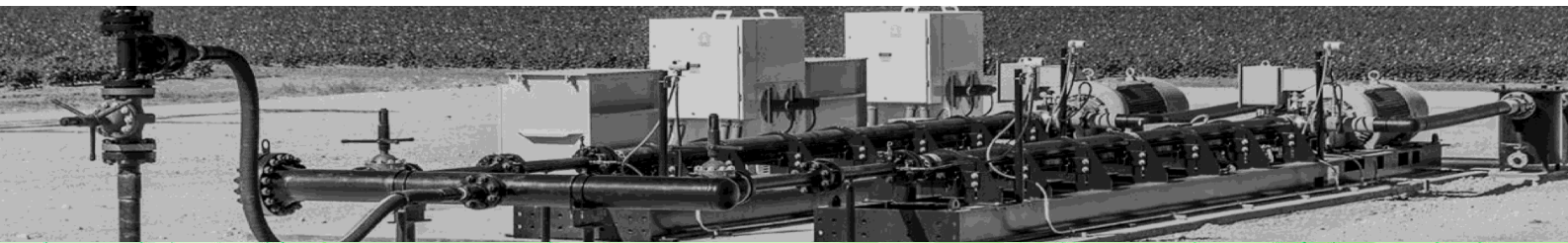
SHGA-9700 has a comparable reaction rates to 15% HCl (at a 33% dilution), while offering advantages such as being non-corrosive to human tissue (concentrate), and an ultra-low corrosion rate to equipment. Maximize operational efficiencies, while decreasing storage, logistic, and exposure liability. Low vapor pressure (fuming) and wireline deployable systems.

SHSFH1-1020

SHSFH1-1020 is an advanced proprietary formulation designed to be used as an environmentally safe, non-hazardous additive during fracture stimulation in well completion. Powered by NRGMax®, SHSFH1-1020 is an eco-friendly surfactant that is inherently safe for the environment, while improving fracture effectiveness and overall well performance.

SHSI-2786

SHSI-2786 is a powerful inhibitor for sulfate and carbonate scales in typical oilfield brines. Additionally, SHSI-2786 is readily biodegradable.



PRODUCT HIGHLIGHTS

SHGA-9700

Wireline Deployed Spearhead Acid System

AVAILABLE ACROSS NORTH AMERICA IN EVERY BASIN.



SAVE UP TO 20 MINUTES PER STAGE, ADDING UP TO DAYS OF TIME SAVINGS PER PAD IN SOME CASES.

SHGA-9700 minimizes the hazardous exposure levels, corrosion rates, and negative HS&E properties of HCl while maintaining the positive aspects of solubilizing ability and reactivity rates.

Wireline samples after 96 hours exposure at 90°C (194°F) at 600 psi.

33% SHGA-9700



Premium 7.5% HCl acid blend



Competitor Product (Urea Hydrochloride)



SHGA-9700 BENEFITS

- Ultra-Low corrosion rate to Wireline, Tubular, and BHA
- Allows Acid to be Spotted Across all Perforation Clusters
- Save up to 20 mins Equipment Time Per Stage
- High Thermal Stability up to ~190°C (374°F)
- Adjust Concentrations on the Fly for Zones with Tougher Breakdowns
- Approved by Most Major Wireline Operators and Service Companies
- Save up to One Hole Volume of Water per Stage
- Non-Regulated for Transport and Storage in the USA (*by ground)
- Optimize Acid Diversion and Frac Placement
- Low-Fuming and Non-Corrosive to Human Tissue
- Proven across North America with Major Operators



PRODUCT HIGHLIGHTS

SHSFH1-1020

Environmentally Safe, Non-ionic Surfactant Package

Powered by NRGMax®, SHSFH1-1020 covers the formation more efficiently and promotes better fluid recovery and flow. Essential to our one-of-a-kind blend is a non-ionic surfactant package, which shifts the wettability of porous surfaces to more water wetting to displace the adhered oil on reservoir rock and promote spontaneous imbibition. By leveraging advanced frac fluid chemistry, NRGMax® demonstrates multi-faceted possibilities for improving environmental performance and increasing production. Our formula **does not contain marine pollutants**, is **nontoxic**, and is comprised of components from the **EPA's Safer Choice ingredients** list. SHSFH1-1020 can improve results in completions, restims, water floods, and more.

PRODUCT BENEFITS

- Water-soluble product, which allows for premixing in the frac tank or in-line during pumping of treatment fluid.
- Proprietary blend of surfactants and NRGMax® that is compatible with most frac fluid systems.
- Excellent non-emulsifier.
- Helps remediate potential damage to formation.
- Post-stimulation well productivity increases with improved recovery.
- IFT at 1GPT – 96k TDS: 1.656 mN/m
- Contact Angle at 1GPT – 96k TDS: 32.3 CA(M) degrees

ELEVATED PERFORMANCE

- **Increased Tolerance to Salinity and Heat:** When SHSFH1-1020 is utilized for flowback and waterflood applications, the surfactant is shown to have significantly strengthened wettability alteration capabilities, and in waters of widely varying composition and salinity.
- **Reduced Surface Tension:** SHSFH1-1020 lowers the surface tension of the liquid, which reduces the energy required to overcome the liquid/gas interface and expand the interfacial area.
- **Reduced Interfacial Tension:** SHSFH1-1020 decreases the interfacial tension of the oil and treatment fluid by reducing the energy required to overcome the resistance of their interface. Combining this with the ability of the surfactant to alter rock wettability to a more water wet state displaces surface oil deposits more efficiently.
- **Improved matrix and proppant pack clean-up.**



PRODUCT HIGHLIGHTS

SHSI-2786

Sulfate and Carbonate Scale Inhibitor

Shotwell's copolymer products were specifically designed to stop and prevent the formation of mineral precipitates and scales. As a proven bio-friendly polymer, SHSI-2786 is a powerful inhibitor for sulfate and carbonate scales in typical oilfield brines. Additionally, SHSI-2786 is readily biodegradable.

APPLICATIONS

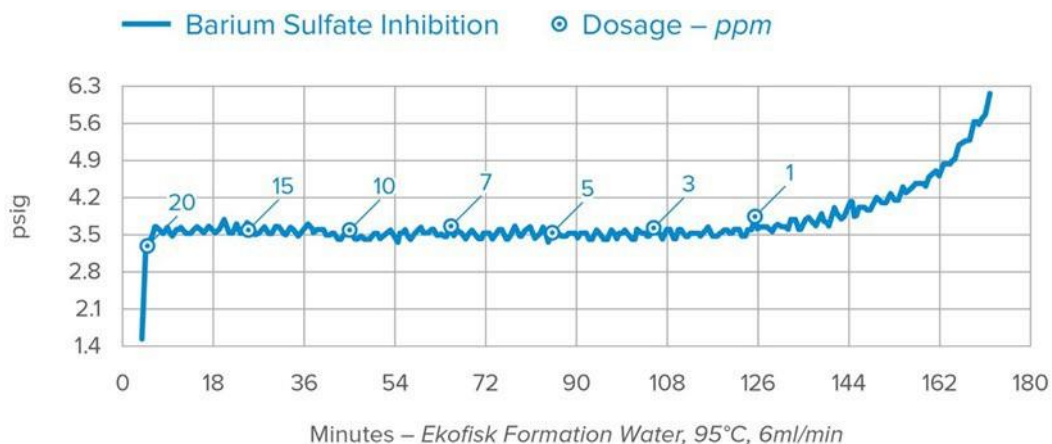
- Outstanding sulfate and carbonate inhibition
- Superior dispersant action
- Stable to over 120°C (248°F)
- Calcium compatibility at pH 3
- Phosphate free

PRODUCT BENEFITS

- Developed to inhibit hard forming scales of barium, strontium, and other hard to control sulfate scales.
- Inhibits calcium carbonate scales.
- Additional corrosion protection.
- Easy to use polymer product is readily biodegradable (OECD 306).

PERFORMANCE AND RESULTS

- The ability of Shotwell's copolymer products to prevent and control various mineral scales including calcium carbonate, calcium sulfate, barium sulfate, strontium sulfate, iron-based scales and calcium oxalate is well known. In this DSL example for barium sulfate, the copolymer product MIC is determined from the stair-step reduction in product dosage.



CONTACT US

Delivering comprehensive solutions to meet market needs
Faced with the current dual pressure of development cost and environmental protection, Shotwell's eco-friendly fluid system is the perfect alternative to current fracking solutions. Shotwell is committed to the success of our customers through chemistry and continuous innovation.



LEADING-EDGE FACILITY

- ▶ Fully Automated
- ▶ ISO9001:2015 certified
- ▶ NSF certified

LOCATION

- ▶ Heart of Permian Basin
- ▶ 35,000 square feet
- ▶ Midland, Texas



CONTACT US FOR MORE INFORMATION:

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WWW.SHOTWELLHYDROGENICS.COM

QUALITY

- ▶ Blend capability up to 57.6M gallons/year
- ▶ Stringent Quality Control and Quality Assurance Standards



SERVICE

- ▶ Reliable technical and lab support
- ▶ Transport Bulk and Non-Bulk containers to field

