



SCIENCE DRIVEN SOLUTIONS FOR EFFECTIVE STIMULATION FLUIDS

INTEGRATED COMPLETION LABORATORY SERVICES FOR CUSTOMIZED FLUID DESIGNS AND OPTIMIZED RECOVERY

Premier Oilfield Group utilizes a space of 11,000 ft² to house state of the art testing instrumentation and the highest degree of professional, knowledgeable and experienced personnel. Premier provides world class chemical evaluation and fluid enhancement testing. Utilizing industry standard procedures combined with a broad range of disciplines and specialized instrumentation yields a highly comprehensive examination of conventional and unconventional reservoir characterization.



WATER COMPOSITION

Water is the most used chemical in a completion fluid. Understanding the elemental make-up of source waters is vital to developing an effective frac fluid. Water analysis should always be put ahead of treatment chemicals decisions.

WATER ANALYSIS: Provides elemental analysis for formation fluids, flowback, produced and/or source frac water. A typical analysis includes pH, alkalinity, specific gravity, total dissolved solids (TDS) and hardness (anionic and cationic part).

MICROBIAL ANALYSIS: Studied using ATP, SRB, and APB kits to determine the bacterial presence in the fluid and effectiveness of biocides on bacteria.

SCALING TENDENCY: Software to predict scaling potential over a broad range of parameters such as brines mixing, pH and temperature.

DYNAMIC SCALE LOOP: Perform quick and accurate evaluation of scaling potential and inhibitor performance under dynamic temperature and pressure conditions.



STIMULATION FLUID EVALUATION

Our Subject Matter Experts perform various analyses to examine the compatibility between the target formation, formation fluids and additives. Testing packages to evaluate numerous stimulation fluids including; friction reducers engineered for the specific water parameters, linear and crosslinked fluid systems, chemical compatibility and effectiveness, and acid systems.

FRICITION FLOW LOOP: Evaluates the effectiveness of a friction reducer in a given water chemistry. Friction reducer can be added “on the fly” to simulate wellsite application or via batch mixing. This instrument is equipped with three different pipe diameters to provide optimal data for comparing additives.

RHEOLOGICAL PERFORMANCE TESTING: Design, test, and optimize frac fluids formulations in fresh and produced waters at downhole pressure and temperature. Including friction reducer viscosity measurement and rheological performance evaluation ($n'K'$ and $G'G''$).

FORMATION RESPONSE TESTER: This specialized permeameter determines the effects of a desired fluid package on the permeability of reservoir or simulated reservoir core.

PRODUCTION CORROSION: Premier provides a wide temperature range of corrosion inhibitor testing (up to 600°F) to evaluate the performance a desired inhibitor.



WETTABILITY STUDIES

Evaluation of chemical efficacy when applied to frac sources and tested with formation oils, is proved to be a necessity for operation engineers to make effective and economic chemical choices.

SURFACE TENSION, INTERFACIAL TENSION AND CONTACT ANGLE: Evaluate surfactant ability in altering the wettability of oil-wet formations to enhance the imbibition process of frac fluids for optimized oil recovery purposes.

EMULSION TESTING: Evaluate the demulsification performance of chemical products at temperature above WAT by visually inspecting the emulsion separation process at different time intervals and mixing ratios.

WETTABILITY COLUMN TEST: Evaluate flowback enhancer effectiveness to enhance oil recovery through a formation pack.



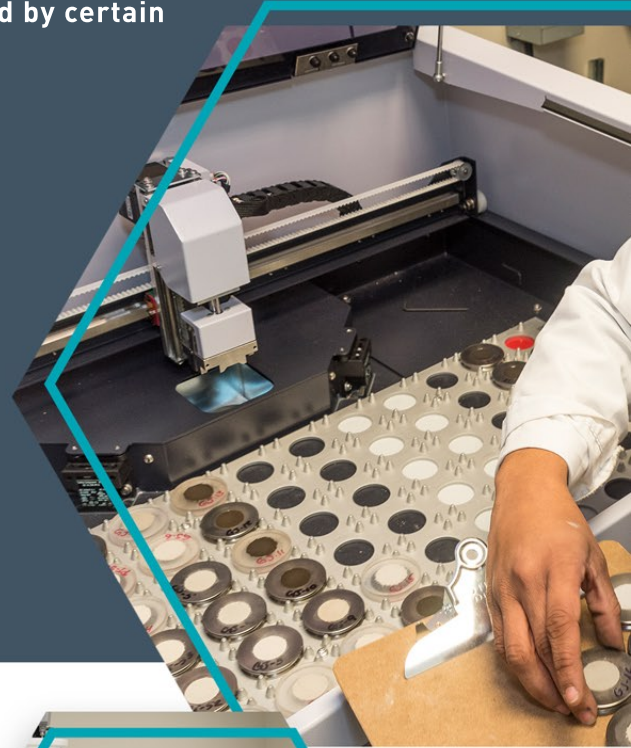
FORMATION EVALUATION & SENSITIVITY TESTING

To effectively stimulate a reservoir, it is imperative to have a comprehensive understanding of the formation and know how it will be affected by certain water and fluid chemistry.

X-RAY DIFFRACTION (XRD): Premier experienced mineralogists will determine the bulk composition of formation material along with clay speciation. Determining the amount of water sensitive minerals contained in the formation can help make better treatment fluids decisions.

CAPILLARY SUCTION TIME TESTING (CST): This test is performed to determine the swelling sensitivity of formation material when exposed to frac fluids, and to evaluate and optimize the performance of clay stabilizer products needed to inhibit this swelling effect.

ROLLER OVEN SHALE DISAGGREGATION TESTING: This test compliments CST by utilizing the same chemical package in a different form of testing. Specific mesh size formation material is subjected to various fluid packages to determine the extent to which the formation disaggregates in certain fluid environments and the effectiveness of chemical additives at inhibiting this effect.



PROPPANT TESTING

A solid material designed to keep a hydraulic fracture open following a stimulation treatment to create a highly conductive path of flow from the formation.

PROPPANT CHARACTERIZATION:

API and ISO testing procedures for evaluating proppants used in hydraulic fracturing. Proppants refers to sand, ceramics, resin-coated, high-density, and other materials.

PROPPANT TRANSPORT SIMULATOR:

Our proprietary fracture simulator is designed to represent a multi-fracture network and facilitate the visual evaluation of proppant transport. The velocity and shear rate through the model can be designed to meet specific testing objectives.

SPECIALIZED DIVERTER TESTING:

Premier has developed specialized testing to evaluate the effectiveness of diverting material across fractures or perforations under pressure and determine rate of downhole degradation. Modified Fluid-Loss Cells and Hydrolysis testing are the primary instruments utilized for this analysis.



OIL CHARACTERIZATION

Wide-range of hydrocarbon characterization such as basic sediment and water, viscosity, flash point, cloud point, paraffin and asphaltene analysis and API Gravity. Wax Appearance Temperature (WAT) is determined using Differential Scanner Calorimeter (DSC).

POFG FLUIDS LABORATORY CAPABILITIES

- Acid Solubility
- Ambient Rheology
- Cold Finger
- Conductivity
- Coreflood
- Crude Oil Analysis
- Crush Resistance
- CST
- Density
- Diverter Analysis
- DSC
- DSL
- Emulsion Testing
- Flow Loop
- Foam Quality
- Foam Rheology
- FT-IR
- GC-MS
- Goniometer
- HPHT Rheology
- HPLC
- ICP-OES
- Krumbein Factor
- Low Viscosity Rheology
- LPR
- Particle Size
- pH
- Proppant Transport
- RCE
- Roller Oven
- Scale Potential
- SEM
- Sieve Analysis
- Spontaneous Imbibition
- Tensiometer
- Turbidity
- UV-VIS Spectrophotometer
- Vortex Closure
- WAT
- Water Analysis
- Wettability Column Test
- XRD
- Zeta Potential



PREMIER SUBJECT MATTER EXPERT

FRANK ZAMORA *SVP FLUID SERVICES*
HOUSTON, TX

With more than 40 years experience, including most recently Senior VP of Engineering and Technology for FTSI Frank holds more than 50 patents to date, authored 4 technical papers and is a recognized leader in hydraulic fracturing circles.

FOR INQUIRIES OR LAB TOURS
CALL (281) 783-6130 OR VISIT www.POFG.com