smartchemical
SERVICES

# PRODUCT CATALOG

## Innovation in Chemistry, Value in Service.

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# Innovation in Chemistry.
# Value in Service.

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Smart Chemical Services delivers innovative chemical solutions and responsive service that help our customers improve performance, reduce risk, and maximize the value of every well - across the lifecycle.

## What We Do

- Completion Chemical Services
- Drill-Out Chemical Services
- Production Chemical Services
- Fuels & Commodity Services

## The Smart Advantage

*Technical Stewardship Across the Life-of-Well*

We bridge the gap between molecular diagnostics and field execution to deliver a comprehensive framework for asset integrity.

### Diagnostic Core & R&D Depth

Every program begins in our laboratory. From the Midland Technical Center to our Ennis Innovation Hub, we perform scientific analysis on your specific reservoir mineralogy to engineer qualified, performance-driven chemistry.

### Integrated Life-of-Well Support

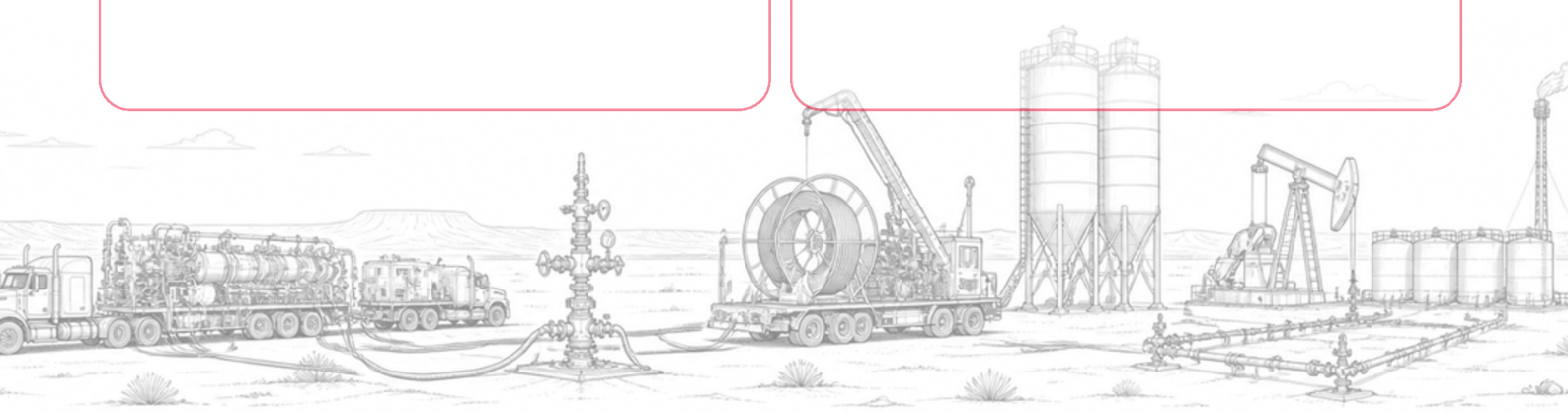
We offer seamless chemical management across the entire operational lifecycle—from High-Intensity Completions and Drill-Outs to specialized Production and Midstream programs.

### Vertically Integrated Supply Chain

With over 156,000 sq. ft. of manufacturing capacity, a private logistics fleet, and 12 strategic distribution hubs, we maintain total direct-to-wellbore control and eliminate supply chain volatility.

### Data-Driven Transparency

Through SMART View® and I/O Pro Mega, we provide real-time reporting and digital receipts for every gallon injected, delivering 100% confidence in your program's execution and performance.



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# BIOCIDES

## Advanced Microbial Control Solutions

### BIOCIDE PRODUCT LINE

Smart Chemical Services offers a range of high-performance biocides designed to manage and eliminate harmful microbial activity, protecting your operations and maximizing asset life.

**MICROBIAL ELIMINATION**

**SYSTEM PROTECTION**

**CHEMICAL INTEGRITY**

**ASSET LONGEVITY**

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# B-445-50™

## DIDECYLDIMETHYL AMMONIUM CHLORIDE

### PRODUCT DESCRIPTION

B-445-50™ is an EPA-registered, 50% active microbiocide featuring naturally plant-derived didecyl dimethyl ammonium chloride in an ethanol and isopropanol solution. It is specifically engineered to control harmful microbial growth in industrial water systems and oilfield applications. The active ingredient is also Ecologo-certified in Canada as environmentally safe under the CD-166 standard.

### RECOMMENDED APPLICATIONS

- Usage: Highly effective in oilfield water flood and saltwater disposal systems, as well as fracturing fluids.
- Industrial Systems: Suitable for recirculating cooling tower water, retort water systems, and auxiliary wastewater systems.
- Application: Provides robust control over algae, fungi, and bacteria in once-through fresh water cooling systems.
- Safety Note: Should be stored in sealed containers in a cool, dry place. If frozen, it can be gently heated and stirred to restore homogeneity without damaging the product.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Colorless to beige liquid |
| Active Quaternary | 50% minimum |
| pH, 10% Aqueous | 7 +/- 2 |
| Solubility | Miscible |
| Odor | Almond |
| Specific Gravity | 0.92 |
| Flash Point (PMCC) | 122.0 °F (50.0 °C) |
| Viscosity | 28.7 mm2/s cSt |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# Smartcide 510™

**BIOCIDE | GLUT/QUAT 5:10**

## PRODUCT DESCRIPTION

Smartcide 510™ is a highly effective synergistic microbiocide featuring 5% Glutaraldehyde and 10% Alkyl dimethyl benzyl ammonium chloride. It is designed for controlling spoilage, odor-causing, corrosion-inducing, and slime-forming bacteria, as well as sulfate-reducing bacteria, fungi, yeast, molds, and algae.

## RECOMMENDED APPLICATIONS

- Usage: Effective in oil well drilling, oil field processing applications, and various water systems including recirculating cooling water and heat transfer systems.
- Dosage: Typically used at a concentration of 0.10 - 0.50 gal/1000gal.
- Compatibility: Compatible with all anionic, non-ionic, and cationic additives present in treatment fluids.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Transparent Liquid |
| Color | Colorless to light yellow |
| pH | 3.75 - 5.75 |
| Solubility In Water | Soluble |
| Pour Point | - 3°C |
| Specific Gravity | 1.01 |
| Density | 8.42 lb./gal |
| Flash Point | 120°C |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# Smartcide 802™

**BIOCIDE | GLUT/QUAT 8:2**

## PRODUCT DESCRIPTION

Smartcide 802™ is a synergistic microbiocide containing 8.0% Glutaraldehyde, 0.8% Alkyl dimethyl benzyl ammonium chloride, and 1.2% didecyl dimethyl ammonium chloride. It provides broad-spectrum control against sulfate-reducing bacteria, fungi, yeast, molds, and algae.

## RECOMMENDED APPLICATIONS

- Usage: Optimized for oil and gas production, including water flood systems, fracturing fluids, and transmission pipelines.
- Application: Can be dosed directly by open pouring or metered pump, ideally added after any heating stage.
- Benefits: Functional over a broad pH and temperature range; does not contain or release formaldehyde.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Transparent Liquid |
| Color | Colorless to light yellow |
| pH | 3.0 - 5.0 |
| Solubility In Water | Miscible |
| Boiling Point | > 100.5°C / 213°F |
| Pour Point | - 18°C / 0°F |
| Specific Gravity | 1.02 |
| Density | 8.47 lb./gal |
| Flash Point | > 302°F |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

# Smartcide 1203™

**BIOCIDE | GLUT/QUAT 12:3**

## PRODUCT DESCRIPTION

Smartcide 1203™ is formulated with 12% Glutaraldehyde, 1.2% ADBAC, and 1.8% DDAC Quats. It is a highly effective synergistic biocide used to control odor-causing and corrosion-inducing bacteria in industrial water and oil field applications.

## RECOMMENDED APPLICATIONS

- Usage: Suitable for fracturing/frac fluids, drilling, completion, workover fluids, and packer fluids.
- Dosage: Typically used at a concentration of 0.10 - 0.50 gal/1000gal.
- Key Benefits: Specifically designed to control sulfate-reducing bacteria and is compatible with anionic, nonionic, and cationic dispersants.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Transparent Liquid |
| Color | Colorless to light yellow |
| pH | 3.5 - 5.5 |
| Solubility In Water | Soluble |
| Boiling Point | > 100°C / 212°F |
| Pour Point | - 9°C / 16°F |
| Specific Gravity | 1.02 |
| Density | 8.53 lb./gal |
| Flash Point | 263.8°F |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# Smartcide 1445™

**BIOCIDE | DDAC 10%**

## PRODUCT DESCRIPTION

Smartcide 1445™ is a 10% Didecyl dimethyl ammonium chloride microbiocide. It is highly effective for controlling spoilage, fungi, and algae in various industrial and oil field processing applications.

## RECOMMENDED APPLICATIONS

- Usage: Ideal for swimming pools, spas, fountains, and industrial water systems in addition to oil well drilling applications.
- Dosage: Typically used at a concentration of 0.10 - 0.50 gal/1000gal.
- Compatibility: Compatible with all anionic, non-ionic, and cationic additives.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Liquid |
| Color | Colorless to light yellow |
| pH | 6.0 - 8.0 |
| Solubility In Water | Miscible |
| Boiling Point | > 98.90°C / 210°F |
| Specific Gravity | 0.984 |
| Density | 8.21 lb./gal |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# Smartcide 1984™

**24% TETRAHYDRO-3,5-DIMETHYL-2H-1,3,5-THIADIAZINE-2-THIONE**

## PRODUCT DESCRIPTION

Smartcide 1984™ is a broad-spectrum microbiocide featuring 24% Tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione. It is engineered to control spoilage, odor-causing, corrosion-inducing, and slime-forming bacteria, as well as sulfate-reducing bacteria and fungi in demanding oil and gas applications and industrial systems.

## RECOMMENDED APPLICATIONS

- Usage: Ideal for oilfield water treatment, water floods, oil and gas field process waters, and pipeline/tank maintenance.
- Application: Highly effective in oil field drilling muds, as well as workover and completion fluids.
- Dosage: Typically used at a concentration of 0.10 – 0.50 gal/1000 gal.
- Compatibility: Compatible with all anionic, non-ionic, and cationic additives present in treatment fluids.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Liquid |
| Color | Yellow to Amber |
| pH | >12 |
| Specific Gravity | 1.15 |
| Flash Point | > 212°F (100°C) |
| Freeze Point | - 22°F (30°C) |
| Density | 9.59 lb./gal |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# Smartcide 2512™

**BIOCIDE | GLUT/QUAT 25:12**

## PRODUCT DESCRIPTION

Smartcide 2512™ is a powerful synergistic biocide containing 25.25% Glutaraldehyde, 5.06% ADBAC, and 7.59% DDAC Quats. It provides maximum control over slime-forming and sulfate-reducing bacteria in pulp, paper, and oil field systems.

## RECOMMENDED APPLICATIONS

- Usage: Used in waterflooded systems, fracturing fluids, and gas production/transmission pipelines.
- Dosage: Typically used at a concentration of 0.10 - 0.50 gal/1000gal.
- Benefits: Low in toxicity, easy to handle, and contains no heavy metals.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Transparent Liquid |
| Color | Colorless to light yellow |
| pH | 3.0 - 5.0 |
| Solubility In Water | Soluble |
| Boiling Point | > 100°C / 212°F |
| Pour Point | - 9°C / 15°F |
| Specific Gravity | 1.05 |
| Density | 8.75 lb./gal |
| Flash Point | >302.0°F |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# BREAKERS

## Optimized Fluid Recovery & Cleanup

### BREAKER PRODUCT LINE

The SmartBreak line of oxidative and encapsulated breakers is engineered to ensure complete polymer degradation and maximum fracture conductivity. Our high-performance formulations are designed to:

**PRECISION SCISSION**

**THERMAL STABILITY**

**DELAYED RELEASE**

**ENHANCED CLEANUP**

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# SmartBreak AP

## LIVE POLYMER BREAKER

## PRODUCT DESCRIPTION

SmartBreak AP is a non-encapsulated ammonium persulfate breaker developed for hydraulic fracturing fluids that require immediate oxidizing activity. In aqueous polymer systems, it generates reactive sulfate radicals to promote direct chain scission of hydrated guar and related polysaccharide-based viscosifiers.

## RECOMMENDED APPLICATIONS

- Usage: Ideal for applications where rapid viscosity reduction and efficient polymer degradation are needed after fluid transport.
- Application: Suited for guar-based fracturing systems and other water-based polymer fluids where a straight ammonium persulfate product is preferred.
- Benefits: Supports fluid cleanup, lowers residual polymer loading, and improves recovery of permeability and fracture conductivity.
- Dosage: Actual dosage must be established through laboratory break testing under representative job conditions.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Chemical Identity | Ammonium Persulfate |
| CAS Number | 7727-54-0 |
| Appearance | White Crystalline Solid |
| Purity | 99% Min |
| Active Oxygen | 6.94% Min |
| pH, 5% Aq. Soln. | 3-5 |
| Sulfuric Acid | 0.1% Max |
| Iron | 5 ppm Max |
| Lead | 5 ppm Max |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# SmartBreak E10

## GUAR ENZYME BREAKER

### PRODUCT DESCRIPTION

SmartBreak E10 is a highly efficient, patented enzyme system specifically engineered to degrade guar and derivatized guar polymers under extreme bottom-hole conditions. Unlike oxidative breakers that can be consumed by secondary reactions, SmartBreak E10 acts as a catalyst to specifically target and cleave the polymer backbone. This results in superior filter-cake degradation and maximum proppant pack conductivity, providing for significantly higher well productivity at elevated temperatures.

### RECOMMENDED APPLICATIONS

- Guar Degradation: Specifically designed for the complete breakdown of guar-based fracturing fluids.
- Conductivity: Independent laboratory testing has shown regained proppant pack conductivities and filter-cake degradation of more than 80% at 180°F and 250°F.
- Environmental: Non-hazardous, not DOT regulated, and environmentally friendly.
- Dosage: Typically applied in concentrations ranging from 1.0 to 2.0 gpt of the base fluid.
- Dilution: Product concentrate dilutions range from 1:50 to 1:2000 depending on the fracturing fluid pH.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Light Amber Liquid |
| Odor | Fermentation odor |
| Solubility | Soluble in Water<br>Insoluble in Hydrocarbons |
| Concentration | 20,000 to 1,000,000 units/ml |
| Denisty | 8.42 lb/gal (1.003 Kg/L) to 9.12 lb/gal (1.094Kg/L) |
| pH | 5.7 |
| Boiling Point | > 212°F (100°C) |
| Freeze Point | 32°F (0°C) |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# SmartBreak H10

## SLICKWATER POLYMER BREAKER

### PRODUCT DESCRIPTION

SmartBreak H10 is a patented Hydrogen Peroxide-based oxidizing breaker specifically designed to destroy polyacrylamide polymers used in slickwater fracturing treatments. It degrades polymers within hours without interfering with the fluid's friction reduction capabilities.

### RECOMMENDED APPLICATIONS

- Usage: Recommended for any slickwater treatment to return viscosities to essentially that of base water.
- Temperature: Effective at temperatures as low as 90°F within an 18-hour window.
- Limitations: Should only be added "on the fly" to polyacrylamide-based fluids; incompatible with oxygen scavengers.
- Dosage: Typically used at loadings of 0.5 to 1.0 gallons per thousand gallons (gpt) of fluid.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, red liquid |
| Ionic Character | Non-Ionic |
| Freeze Point | 30°F |
| Density | 8.56 lb/gal |
| Odor | None |
| Freeze Point | 30°F |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# SmartBreak HT

## HIGH-TEMPERATURE ENCAPSULATED BREAKER

## PRODUCT DESCRIPTION

SmartBreak HT is a delayed-release oxidative breaker engineered for high-temperature downhole conditions. The encapsulation system restrains early release, ensuring fluid viscosity is maintained through placement before progressively making the oxidizer available for polymer degradation.

## RECOMMENDED APPLICATIONS

- Usage: Intended for high-temperature delayed-break applications in gels, crosslinked gels, and foam-based systems.
- Temperature Range: Optimized for wells with bottomhole temperatures ranging from 150°F to 275°F.
- Application: Ideal for treatments where delayed cleanup of the proppant pack is desired after closure.
- Dosage: Concentration is determined by laboratory testing using target polymer and thermal profiles.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | White Granular Solid |
| Odor | Faint Organic |
| Product Type | Encapsulated Oxidative Breaker |
| Active Chemistry | Ammonium Persulfate |
| Temperature Range | High Temp Service |
| Typical BHT Use | 150°F to 275°F |
| Packaging | Customizable |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# SmartBreak LT

## LOW-TEMP ENCAPSULATED BREAKER

### PRODUCT DESCRIPTION

SmartBreak LT is a delayed-release oxidative breaker developed for hydraulic fracturing fluids that require controlled polymer degradation rather than immediate activity. The product contains ammonium persulfate within a protective encapsulation system that moderates release into the aqueous phase, preserving fluid viscosity during surface handling and early placement downhole.

As temperature and residence time increase, the encapsulated oxidizer is progressively made available to the fluid. This controlled release profile reduces polymer molecular weight after proppant transport is complete, improving gel cleanup and supporting fracture conductivity. It is intended for lower-temperature applications (120°F to 150°F) where conventional live persulfate would break too early.

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | White Granular Solid |
| Odor | Faint Organic |
| Product Type | Encapsulated Oxidative Breaker |
| Active Chemistry | Ammonium Persulfate |
| Temperature Range | Low Temp Service |
| Typical BHT Use | Below 120°F with initiator; typically up to 150°F |

### RECOMMENDED APPLICATIONS

- Usage: Low-temperature hydraulic fracturing requiring delayed oxidative polymer break.
- Gel Systems: Ideal for Guar and derivatized-guar systems where live breaker is too aggressive.
- Performance: Supports viscosity retention through placement in crosslinked gel and foam systems.
- Cleanup: Enhances proppant pack cleanup after leakoff and closure.
- Initiators: In wells below 120°F, pairing with an appropriate initiator is recommended for reliable break timing.

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# BUFFERS

## Precision pH Stabilization Solutions

### BUFFER PRODUCT LINE

The SmartpH line of caustic and acidic buffers is engineered to provide precise, robust pH stabilization for complex fracturing and completions fluids. These synergistic formulations are designed to:

**pH CONTROL**

**BUFFERING CAPACITY**

**SYSTEM STABILITY**

**PRODUCT QUALITY**

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# SmartPH C25

**STIMULATION | PH CONTROL ADDITIVE**

## PRODUCT DESCRIPTION

SmartPH C25 is a water-based alkaline treatment fluid developed for rapid pH adjustment and neutralization in oilfield water systems. It provides a controlled 25% caustic strength that can be metered accurately into hydraulic fracturing fluids, completion water, and cleanup systems where dependable upward pH correction is required.

## RECOMMENDED APPLICATIONS

- Usage: Ideal for pH adjustment of fracturing source water and blended treatment fluids.
- Neutralization: Effective for neutralizing acidic fluid systems prior to pumping or recirculation.
- Alkalinity Control: Used for alkalinity control in produced, brackish, or freshwater treatment programs.
- Dosage: Treatment rate depends on starting water chemistry and target final pH. Confirm dosage through bench titration or jar testing before full-scale treatment.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Transparent liquid |
| Form | Liquid |
| Sodium Hydroxide (NaOH), wt% | 24.0 - 26.0 |
| Specific Gravity @ 60°F | 1.272 typical |
| Solubility in Water | Complete |
| Odor | None |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# SmartPH C50

**STIMULATION | PH CONTROL ADDITIVE**

## PRODUCT DESCRIPTION

SmartPH C50 is a concentrated alkaline treatment fluid developed for rapid pH correction and neutralization where stronger caustic capacity is desired per unit volume. It delivers approximately 50% sodium hydroxide strength in a liquid form that integrates efficiently into continuous feed and batch treatment programs.

## RECOMMENDED APPLICATIONS

- Usage: Designed for operations needing strong neutralization efficiency with a reduced freight and storage footprint.
- Application: Suitable for pH adjustment of fracturing source water and water-conditioning workflows requiring a strong alkaline reserve.
- Optimization: Supplies hydroxide alkalinity immediately to neutralize acidic species and shift the aqueous phase toward the target operating range.
- Dosage: Treatment rate depends on acid demand and target pH. Inject through compatible caustic-service equipment.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear liquid |
| Form | Liquid |
| Sodium Hydroxide (NaOH), wt% | 49.0 - 51.5 |
| Specific Gravity @ 60°F | 1.52 typical |
| Solubility in Water | Complete |
| Odor | None |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# CLAY CONTROL

## Formation Stabilization & Fines Management

### CLAY CONTROL PRODUCT LINE

The SmartGuard and CCW line of clay stabilizers is engineered to permanently bind reactive clays and suppress fines migration. Our advanced ionic and polymeric formulations are designed to:

**HYDRATION SUPPRESSION**

**FINES IMMOBILIZATION**

**PERMANENT STABILIZATION**

**OPERATIONAL VERSATILITY**

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# SmartGuard C100

**IONIC CLAY STABILIZER**

## PRODUCT DESCRIPTION

SmartGuard C100 is a multivalent brine-based clay control additive designed to temporarily suppress clay hydration. It functions by compressing the electrical double layer around expandable clays and displacing monovalent cations at the surface. This mechanism minimizes short-term formation sensitivity in smectite- or illite-bearing formations.

## RECOMMENDED APPLICATIONS

- Usage: Ideal for pre-flush or on-the-fly applications in slickwater and hybrid fracturing.
- Water Types: Performs effectively in both fresh and high-TDS/produced water environments.
- Compatibility: Fully compatible with anionic/cationic friction reducers, surfactants, and crosslinkers.
- Benefit: Cost-effective brine-based alternative to polymeric clay binders for short-term control.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear Colorless Liquid |
| pH (neat) | 5.68 |
| Specific Gravity @ 25°C | 1.203 - 1.239 |
| Density (lb/gal) | 10.043 – 10.343 |
| Solubility in Water | Complete |
| Odor | Mild |
| Pour Point | –28°F to –31°F |
| Freeze Point | –30°F (approximate) |
| Viscosity @ 25°C | < 30 cP |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# SmartGuard C200

## HIGH-DENSITY CLAY STABILIZER

### PRODUCT DESCRIPTION

SmartGuard C200 is a high-density, inorganic clay control additive featuring a concentrated divalent brine system enhanced with an organic ionic component. This dual-action mechanism promotes rapid compression of the electrical double layer and competitive cation exchange, suppressing fines dispersion during injection and early flowback.

### RECOMMENDED APPLICATIONS

- Usage: Designed for clay-sensitive formations where predictable, short-term suppression is required.
- Efficiency: High-density formulation allows for effective treatment at lower dosage rates.
- Application: Seamless integration into high-rate slickwater systems using fresh or recycled water.
- Dosage: Typical on-the-fly dosage ranges from 0.5 – 2.0 gallons per 1,000 gallons.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear Colorless Liquid |
| pH (neat) | 4.20 – 5.20 |
| Specific Gravity @ 25°C | 1.235 – 1.271 |
| Density (lb/gal) | 10.306 – 10.606 |
| Solubility in Water | Complete |
| Odor | Mild |
| Freeze Point | < –15°F |
| Viscosity @ 25°C | < 30 cP |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# SmartGuard C319

**STIMULATION | PH CONTROL ADDITIVE**

## PRODUCT DESCRIPTION

SmartGuard C319 is a high-performing, environmentally friendly shale stabilizer. As a low-molecular-weight polymer, it is designed to penetrate deep into the rock matrix to encapsulate fines and seal anionic clay sites. This dual-purpose technology addresses both swelling clays and fines migration simultaneously.

## RECOMMENDED APPLICATIONS

- Usage: Compatible with slickwater, hybrid, and gel systems.
- Environment: Designed as a green alternative that outperforms industry standards.
- Performance: Electronically directed to clay sites to prevent interaction with fluids.
- Compatibility: Compatible with all anionic and non-ionic additives present in treatment fluids.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear yellow |
| Physical State | Liquid |
| Specific Gravity @ 25°C | 1.235 |
| Density | 10.30 lbs./gal. |
| pH (Neat) | 4.50 - 5.50 |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# CCW-1200

## CLAY STABILIZER & FINES CONTROL

### PRODUCT DESCRIPTION

CCW-1200 is a liquid clay stabilizer and fines control additive engineered for hydraulic fracturing and drill-out operations. It features a strongly adsorptive cationic stabilization package that anchors to clay and siliceous surfaces, suppressing hydration, dispersion, and fines release. This prevents permeability damage and ensures cleaner circulation systems during drill-outs.

### RECOMMENDED APPLICATIONS

- Usage: Ideal for slickwater and hybrid fracturing in clay-sensitive shale and siltstone intervals.
- Drill-Out Service: Supports debris transport by limiting the generation of clay-rich fines.
- Compatibility: Supports consistency across fresh, brackish, and blended frac water systems.
- Dosage: Typical fracturing dosage is 0.5 – 2.0 gpt; drill-out dosage is 0.20 – 0.85 gallons per 10 barrels.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, Colorless |
| Form | Liquid |
| Specific Gravity @ 25°C | 1.029 - 1.065 |
| Density, lb/gal @ 25°C | 8.587 - 8.887 |
| pH (Neat) | 9.37 - 10.37 |
| Freeze Point | -17°F |
| Treat Rate | 0.5 - 2.0 gal/1,000 gal |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# SmartGuard Pro 430

## LONG-CHAIN PERMANENT CLAY CONTROL

### PRODUCT DESCRIPTION

SmartGuard Pro 430 is a long-chain clay control additive designed to permanently bind reactive clays. Its extended polymeric backbone enhances bridging and interaction with negatively charged clay surfaces. It provides durable stabilization with minimal chemical interference in both fresh and brine-based systems.

### RECOMMENDED APPLICATIONS

- Usage: Optimized for wells with smectite, illite, or mixed-layer clays.
- Performance: Delivers permanent stabilization that is resistant to washout and backflow.
- Application: Continuous low-dose application upstream of blender suction.
- Compatibility: High compatibility with anionic friction reducers and surfactants.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear colorless |
| Physical State | Liquid |
| Pour Point | 9°F |
| Specific Gravity @ 25°C | 0.973 – 1.009 |
| Density | 8.12 – 8.42 lb/gal |
| Solubility in Water | Complete |
| Viscosity @ 25°C | < 20 cP |
| pH (Neat) | 4.20 – 5.20 |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# SmartGuard Pro 670

## ANIONIC PERMANENT CLAY CONTROL

### PRODUCT DESCRIPTION

SmartGuard Pro 670 is a high-performance anionic clay control additive built around a proprietary surface-active phosphorus complex. It provides permanent clay immobilization and is highly resistant to washout. Its solvent-modified, alkaline formulation promotes rapid dispersion in high-salinity and recycled water environments.

### RECOMMENDED APPLICATIONS

- Usage: Specifically engineered for long-term stabilization of smectite and mixed-layer clays.
- Brine Systems: Highly effective in high-TDS, brine, and recycled water environments.
- Compatibility: Anionic system enhances compatibility with friction reducers, surfactants, and biocides.
- Dosage: Typical on-the-fly dosing of 0.5 – 2.0 gallons per 1,000 gallons.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear colorless |
| Physical State | Liquid |
| Pour Point | -15°F |
| Specific Gravity @ 25°C | 1.168 – 1.204 |
| Density | 9.747 – 10.047 lb/gal |
| Solubility in Water | Complete |
| Viscosity @ 25°C | < 20 cP |
| pH (Neat) | 4.2 – 5.2 |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# CROSSLINKER

## Advanced Rheology Control & Viscosity Management

### CROSSLINKER PRODUCT LINE

The SmartXL line of borate-based crosslinkers is engineered to create thermally stable, elastic gel structures for complex hydraulic fracturing and completions fluids. These synergistic formulations are designed to:

VISCOSITY CONTROL

ELASTIC HEALING

DELAYED REACTION

THERMAL STABILITY

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smartchemical SERVICES

# Smart BBXL

**BORATE-BASED, PH BUFFERED, 4% BORON, CROSS-LINKER**

## PRODUCT DESCRIPTION

Smart BBXL is a self-buffering, borate-based crosslinker in an aqueous base. It is engineered to provide immediate viscosity in gel-based fracturing fluid systems, specifically for low to mid-range temperature polymer applications. By delivering a rapid crosslink, it ensures optimal fluid rheology for efficient proppant transport.

## RECOMMENDED APPLICATIONS

- Usage: Instant crosslinker for guar and guar-derivative fluid systems.
- Benefits: Self-buffering properties simplify field operations by reducing the need for additional pH control additives.
- Proppant Transport: Provides excellent carrying properties to maintain frac geometry.
- Application: Can be added on-the-fly for real-time viscosity management.
- Dosage: Typically used at a concentration of 0.75 – 1.25 gallons per 1,000 gallons.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, colorless to light Amber |
| Specific Gravity @ 25°F | 1.35 |
| pH (neat) | > 14 |
| Temperature Range | 60°F to 250°F |
| Density (lb/gal) | 11.3 |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartXL 5

**5% BORATE-BASED CROSSLINKER**

## PRODUCT DESCRIPTION

SmartXL 5 is a 5% borate-based crosslinker in a stable aqueous base. It is designed to provide immediate viscosity and gel strength in fracturing fluid systems. This pH-neutral formulation is optimized for low to mid-range temperature environments, ensuring a reliable and predictable gel structure for proppant placement.

## RECOMMENDED APPLICATIONS

- Usage: Provides immediate viscosity for all types of guar and guar-derivative fluids.
- pH Profile: Formulated to be pH neutral (approx. 6.97) for easier integration into diverse fluid chemistries.
- Performance: Delivers excellent proppant carrying properties to ensure successful stimulation treatments.
- Dosage: Typically used at a concentration of 0.25 – 0.80 gallons per 1,000 gallons.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, colorless to light Amber |
| Specific Gravity @ 25°F | 1.14 |
| pH (neat) | 6.97 |
| Density (lb/gal) | 9.51 |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartXL HT

**DELAYED BORATE-BASED CROSSLINKER, HIGH-TEMP**

## PRODUCT DESCRIPTION

SmartXL HT is a delayed borate-based crosslinker specifically engineered for high-temperature fracturing environments. It produces a thermally stable and elastic gel structure that can heal and reform after shearing. By delaying the crosslink, it preserves fluid integrity through the pumping process before achieving peak viscosity downhole.

## RECOMMENDED APPLICATIONS

- Usage: Delayed crosslinker for guar and derivatized guar systems in elevated temperatures.
- Efficiency: Enables lower polymer loadings by yielding exceptionally high crosslink viscosities.
- Stability: Maintains gel structure for optimal frac geometry and efficient proppant transport.
- Performance: Thermally stable and elastic, allowing the gel to reform after high-shear events.
- Dosage: Typically used at a concentration of 0.5 – 1.5 gallons per 1,000 gallons.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, Viscous Liquid |
| Specific Gravity @ 25°F | 1.10 – 1.20 |
| pH (neat) | 8.55 – 8.85 |
| Density (lb/gal) | 9.90 – 10.10 |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# FOAMERS

## Advanced Well Production & Deliquification Solutions

### FOAMERS PRODUCT LINE

Engineered to restore critical gas velocity and maximize hydrocarbon flow, our specialized foaming agents provide highly efficient deliquification solutions for liquid-loaded wells. When hydrostatic back-pressure stifles reservoir performance, these advanced surface-active agents rapidly reduce fluid surface tension and density, converting heavy water and condensate columns into a light, stable foam. This drastically lightened fluid column allows the well's natural reservoir pressure to easily unload liquids to the surface—effectively eliminating restrictive hydrostatic heads, boosting daily production rates, and extending the overall economic life of the asset.

**HIGH-EFFICIENCY LIQUID UNLOADING**

**MAXIMIZED RESERVOIR PRODUCTION**

**ADVANCED WELLBORE CLEANOUT**

**ENHANCED OIL RECOVERY**

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smartchemical SERVICES

# DFO 3056™

**SILICONE OIL BASED DEFOAMER**

## PRODUCT DESCRIPTION

DFO 3056™ is a high-performance, silicone oil-based defoamer and anti-foam agent formulated to quickly eliminate and prevent stubborn oil- and water-borne froths. It features a dual-action mechanism that rapidly collapses existing surface foam from the top down while altering solution surface tension downhole to actively suppress bubble formation. It is exceptionally effective at breaking dense foams generated by chemical foaming agents in low-pressure gas wells, completion systems, or high-shear environments.

## PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Pale Yellow, Liquid |
| Specific Gravity | 0.839 |
| Density | 70.0 lbs/gal |
| Flash Point (TCC) | >125 °F |
| Boiling Point | 165°F |
| Freezing Point | < -40°F |

## RECOMMENDED APPLICATIONS

- Foam Suppression & Prevention: Functions both continuously as an anti-foam injected ahead of the problem zone and batchwise as a direct topical defoamer.
- Deliquification & Gas Well Support: Highly efficient at destabilizing heavy, dense chemical foams to assist in trouble-free liquid unloading.
- Completions & Fluid Operations: Resolves severe frothing across complex completion and intervention fluid systems to safeguard fluid density and pumping integrity.
- Flexible Dosing Regimens: Tailored for dynamic field demands with highly efficient treatment ratios varying with system severity.

## PACKAGING

DFO 3056™ is available in standard oilfield chemical packaging configurations to accommodate rapid on-site deployment:

- 275-Gallon IBC Totes (Poly or stainless-steel caged)
- 55-Gallon Drums
- Bulk Transport (Available upon request for high-volume operations)

smartchemical SERVICES

# FAW 3305™

**HIGH-PERFORMANCE DRILLING FOAM**

## PRODUCT DESCRIPTION

FAW-3305™ is an ultra-high-yielding, concentrated, high-foaming liquid surface active agent designed to operate efficiently in both fresh and saltwater environments. Formulated to optimize hole cleaning and air volume requirements, it generates exceptionally stable foam structures with extended fluid retention times. The specialized chemistry improves overall bit penetration rates while actively protecting downhole equipment from solid accumulation during active drilling operations.

## KEY BENEFITS & FUNCTIONS

- Concentrated High Yield Highly concentrated liquid formulation engineered to deliver maximum foam volume and fluid expansion at minimal chemical treat rates.
- Superior Cuttings Transport Provides excellent carrying capacity to efficiently lift drilling debris, silt, and solids out of the wellbore, maximizing hole cleanout.
- Prevention of Bit Balling Actively helps prevent the sticking, packing, and balling of clay and drill cuttings on the bit assembly and bottomhole tools.
- Universal Water Stability Produces consistent, high-retention foam architectures across all water baselines, showing excellent tolerance to high-salinity brines.

## PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Amber Liquid |
| Density | 1.06 – 1.09 |
| pH | 6.95 – 7.10 |
| Solubility in Water @ 25°C | Complete |

## RECOMMENDED APPLICATIONS

- Air, Mist, and Foam Drilling Operations
- Dust Suppression Systems
- Wellbore Solids Cleanouts
- High-Salinity Fluid Unloading

## GENERAL MIXING GUIDES

- Dust Suppressant: 0.5 – 1 Pint introduced directly into the air stream
- Mist Drilling: 1 – 2 Quarts per 100 gallons of fluid base
- Foam Drilling: 3 – 5 Quarts per 100 gallons of fluid base

## PACKAGING

Standard Packaging: Provided in high-durability 330-gallon totes. Alternative packaging dimensions are available upon request.

smartchemical SERVICES

# FRICTION REDUCER

## Advanced Proppant Transport & Fluid Efficiency

### FRICTION REDUCER PRODUCT LINE

The SmartSlick line of high-molecular-weight anionic polymers is engineered for rapid inversion and exceptional shear stability. Our versatile emulsion and dispersion technologies are designed to:

**RAPID INVERSION**

**BRINE TOLERANCE**

**ENHANCED SLICKWATER**

**OPTIMAL FLOWBACK**

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# SmartSlick 150™

**FRICTION REDUCER & VISCOSITY MODIFIER**

## PRODUCT DESCRIPTION

SmartSlick 150™ is a high-molecular-weight, medium-anionic synthetic polymer engineered for rapid field hydration and robust friction reduction. It is designed for a broad range of well types, maintaining performance under challenging brine conditions where conventional anionic reducers often degrade.

## RECOMMENDED APPLICATIONS

- Usage: Optimized for stimulation and fracturing utilizing high-TDS make-up water.
- Performance: Maintains functionality in the presence of iron, calcium, and magnesium.
- Cold Weather: Rapid hydration architecture supports reliable performance even at lower surface temperatures.
- Dosage: 0.25 – 0.50 gpt for friction reduction; 1.50 – 2.00 gpt for viscosification.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | White to pale yellow translucent liquid |
| Charge Type | Medium Anionic |
| Density @ 20°C | 1.0 – 1.2 g/mL |
| Flash Point | ≥ 201°F (94°C) |
| Pour Point | ≤ 32°F (0°C) |
| Viscosity @ 25 °C | 1500 – 3000 cP |
| Viscosity @ 0 °C | ≤ 4000 cP |
| Free Acrylamide Monomer | < 1000 ppm |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSlick 151™

## HIGH-SALT PRODUCED-WATER FR

### PRODUCT DESCRIPTION

SmartSlick 151™ is an anionic polyacrylamide engineered for slickwater fracturing utilizing produced water or mixed brines. It is formulated to disperse quickly across broad water chemistries while maintaining strong tolerance to divalent cations like $Ca^{2+}$/$Mg^{2}$.

### RECOMMENDED APPLICATIONS

- Usage: Performs in brines ranging from low-salinity blends to high-TDS systems.
- Make-down: Designed for quick activation with standard equipment to ensure predictable viscosity.
- Pressure Loss: Reduces losses across surface equipment, supporting higher stage rates.
- Dosage: Typical field dosages range from 0.25 – 1.0 gpt.

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

### PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | White Opaque |
| Physical State | Liquid |
| Flash Point | >201 °F |
| Specific Gravity @ 25°C | 1.05–1.06 |
| pH (Neat) | 6–8 |
| Viscocity | 500–2500 cP |
| Note: | Values are typical and may vary with storage time and conditions. |

smartchemical SERVICES

# SmartSlick 200™

**EXTREME-BRINE FR & VISCOSITY MODIFIER**

## PRODUCT DESCRIPTION

SmartSlick 200™ is a very high-molecular-weight anionic polymer engineered for operations subjected to extreme salinity. It delivers dependable hydraulic efficiency and solids transport in fluids containing ultra-high TDS and elevated concentrations of divalent ions that typically fail standard systems.

## RECOMMENDED APPLICATIONS

- Usage: Specifically for stimulation programs using extreme-salinity make-up water.
- Brine Tolerance: Exceptional tolerance to calcium, magnesium, and iron.
- Operational: Fast dispersion supports reliable deployment in cold or variable surface conditions.
- Dosage: 0.25 – 0.50 gpt for friction reduction; 1.50 – 2.00 gpt for viscosification.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | White to pale yellow translucent liquid |
| Charge Type | Medium Anionic |
| Density @ 20°C | 1.0 – 1.2 g/mL |
| Flash Point | ≥ 201°F (94°C) |
| Pour Point | ≤ 32°F (0°C) |
| Viscosity @ 25 °C | 1500 – 3000 cP |
| Viscosity @ 0 °C | ≤ 4000 cP |
| Free Acrylamide Monomer | < 1000 ppm |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSlick 201™

## ADVANCED HIGH-TDS EMULSION FR

### PRODUCT DESCRIPTION

SmartSlick 201™ is an advanced anionic emulsion friction reducer optimized for high-TDS brines. Its polymer architecture is designed for rapid inversion and exceptional shear stability under high-rate pumping conditions, even in the presence of significant calcium and magnesium.

### RECOMMENDED APPLICATIONS

- Usage: High-rate pumping in fresh, brackish, or produced water with high ionic strength.
- Mechanism: Enables rapid hydrodynamic drag reduction through boundary layer modification.
- Efficiency: Maintains performance integrity at treatment rates as low as 0.25 – 0.50 gpt.
- Stability: Exceptional shear stability preserves molecular weight during the most demanding stages.

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

### PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | White, opaque liquid |
| Flash Point | >201°F |
| Specific Gravity | 1.05 – 1.06 |
| pH | 6 – 8 |
| Viscosity | 500 – 2500 cP |
| Water Compatibility | Fresh to high-TDS brines |
| Shelf Life | Minimum 9 months (unopened, recommended |

smartchemical SERVICES

# SmartSlick 205™

## HIGH-TDS FRICTION REDUCER

### PRODUCT DESCRIPTION

A high-active anionic emulsion polymer developed specifically for heavily mineralized water. It remains stable where conventional friction reducers often fail.

### RECOMMENDED APPLICATIONS

- Slickwater and hybrid fracturing using high-TDS water, and operations needing limited viscosification.

### TREATMENT GUIDELINES

- Friction reduction at 0.20–1.00 GPT; Viscosification at 1.50–2.00 GPT.

### KEY ADVANTAGES

- Engineered for produced water and brines up to approximately 210,000 ppm TDS.
- Rapid inversion and hydration support continuous on-the-fly injection.
- Reduces turbulent pressure losses through pumps and treating iron.

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

### PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Milky, viscous liquid |
| Form | Liquid emulsion |
| Ionic Character | Anionic |
| pH (5 g/L) | 6 – 8 |
| Specific Gravity @ 25°C | 1.05 – 1.10 |
| Bulk Viscosity @ 25°C | < 3,500 cP |
| Approx. Viscosity @ 5 g/L | 1,700 cP |
| Average Non-Volatile Solids | 35 – 42% |
| Maximum Use Concentration | 10 g/L |
| DI Solution Stability | 1 day |
| Recommended Storage Temperature | 5 – 35°C |
| Shelf Life | 6 months |

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# SmartSlick 251™

**FRICTION REDUCER**

## PRODUCT DESCRIPTION

SmartSlick 251™ is a persistent, high-molecular-weight anionic emulsion polymer developed for produced-water fracturing. It is engineered to hydrate efficiently in water loaded with calcium and magnesium, providing dependable drag reduction while contributing fluid body for proppant suspension.

## RECOMMENDED APPLICATIONS

- Usage: High-TDS and high-divalent water systems where polymer persistence is critical.
- Efficiency: Lowers turbulent friction losses through surface equipment to reduce pumping pressure.
- Proppant Support: Contributes useful fluid body to assist in suspension and transport.
- Application: Ideal for maximizing produced water reuse and minimizing freshwater costs.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | White Opaque Liquid |
| Form | Liquid |
| pH (Neat) | 6-8 |
| Specific Gravity @ 25°C | 1.05 - 1.06 |
| Flash Point | > 201°F |
| Viscosity @ 25°C | 500 - 2500 cP |
| Recommended Treat Rate | 0.25 - 0.5 gal/1,000 gal |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSlick H101™

## FRESH WATER HIGH VISCOSITY

## PRODUCT DESCRIPTION

SmartSlick H101™ is a high-molecular-weight anionic polymer emulsion specifically developed for hydraulic fracturing operations. It provides dependable friction reduction in fresh water and light brine systems while offering the unique ability to build fluid body when higher viscosity is required. Designed for rapid field performance, it is ideal for slickwater programs where operational simplicity and efficient drag reduction are critical.

## RECOMMENDED APPLICATIONS

- Superior Friction Reduction: Delivers strong friction reduction in fresh water and light brine fracturing fluids, improving hydraulic efficiency and reducing surface pressure.
- Dual-Action Performance: Functions as a standard friction reducer at conventional rates but transitions into a high-viscosity response at elevated dosages.
- Enhanced Proppant Transport: Contributes meaningful fluid structure to improve proppant carrying capability deeper into the treatment interval.
- Rapid Hydration: Engineered for fast field response and reliable hydration at the blender for efficient on-the-fly treatments.
- Operational Versatility: Suitable for a broad range of water-based stimulation fluids and well-service applications.

## PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Off-white opaque liquid |
| Form | Emulsion |
| pH | 6 – 8 |
| Specific Gravity @ 25°C | ~1.0 |
| Flash Point | > 201°F |
| Viscosity @ 25°C | 500 – 1500 cP |
| Recommended Treat Rate | 0.25 – 0.5 gal/1,000 gal |

## RECOMMENDED APPLICATIONS

- Fresh water slickwater fracturing treatments.
- Light brine fracturing systems requiring dependable drag reduction.
- High-rate pumping programs focused on improving hydraulic efficiency.
- Treatments where supplemental viscosity is needed to improve proppant transport.

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSlick H102™

## LIQUID DISPERSION FRICTION REDUCER

### PRODUCT DESCRIPTION

A high-active liquid dispersion polymer (LDP) designed for hydraulic fracturing where rapid hydration and dependable friction reduction are required. It features an inverse-emulsion platform with a high-molecular-weight anionic polymer for quick dispersion and controlled activation.

### RECOMMENDED APPLICATIONS

- Slickwater and hybrid fracturing, operations requiring fast hydration, and high-rate pumping programs.

### KEY ADVANTAGES

- Delivers strong friction reduction with supplemental viscosifying capability.
- Maintains performance in low-to-medium brines (>50,000 TDS) and elevated temperatures.
- Resists mechanical degradation during high-shear mixing and extended pumping.
- APE/NPE-free formulation with low residual contribution.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Thick liquid, grey to white, off-white opaque |
| Form | Liquid dispersion polymer (inverse emulsion) |
| Charge | Anionic |
| Density @ 20°C (kg/L) | 1.05 – 1.15 |
| Density (lb/gal) | 8.76 – 9.59 |
| Flash Point (closed cup) | ≥ 201°F / 94°C |
| Pour Point | 32°F / 0°C |
| Free Acrylamide Monomer | < 1000 ppm |
| Viscosity @ 25°C | 500 – 3000 cP |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSlick H103™

**HIGH-VISCOSITY ANIONIC FRICTION REDUCER FOR FRESH WATER & LIGHT BRINES**

## PRODUCT DESCRIPTION

SmartSlick H103™ is a high-viscosity friction reducer (HVFR) based on an anionic, high-molecular-weight polyacrylamide. Formulated for fresh water and light-brine operations, it delivers fast friction reduction and stable viscosity development across typical frac temperatures.

## RECOMMENDED APPLICATIONS

- Usage: Optimized for fresh water and light brines with modest hardness.
- Performance: Friction reduction frequently exceeds 65% at typical field dosages.
- Activation: Rapid hydration with standard on-the-fly equipment; minimizes "fisheyes."
- Dosage: 0.25 – 1.0 gpt for drag reduction; enables higher stage rates at lower horsepower.

## PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | White Opaque |
| Physical State | Liquid |
| Flash Point | >201 °F |
| Specific Gravity @ 25°C | ≈ 1.07 |
| pH (Neat) | 6–8 |
| Viscocity | 1000–2200 cP |
| Note: | Typical values are provided for guidance and may change over time. |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# SmartSlick H104™

## RAPID HYDRATION FRICTION REDUCER

### PRODUCT DESCRIPTION

A very high-active anionic polymer emulsion for water-based oilfield fluids. It is engineered to activate quickly at high-turbulence injection points like the blender.

### RECOMMENDED APPLICATIONS

- Water-based hydraulic fracturing, oil/gas/water/injection well services, and applications needing rapid drag reduction.

### TREATMENT GUIDELINES

- Friction reduction at 0.2–1.0 GPT; Viscosification at 1.5–2.0 GPT.

### KEY PERFORMANCE ADVANTAGES

- Provides strong friction reduction while improving shale stability and hole condition.
- Effective across low-salinity to high-brine environments (up to 150,000 TDS).
- Supports solids removal and foam stabilization in air drilling applications.

### PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | White to pale yellow translucent liquid |
| Form | Emulsion |
| Charge | Anionic |
| Density @ 20°C (g/mL) | 1.0 – 1.6 |
| Density (lb/gal) | 8.34 – 13.34 |
| Flash Point (closed cup) | ≥ 201°F / 94°C |
| Pour Point | ≤ 32°F / 0°C |
| Free Acrylamide Monomer | < 1000 ppm |
| Viscosity @ 25°C | 500 – 1500 cP |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSlick H105™

## HIGH-ACTIVITY DISPERSION FR

### PRODUCT DESCRIPTION

SmartSlick H105™ is a high-activity liquid dispersion polymer designed for fracturing programs requiring both drag reduction and meaningful viscosity development. Its inverse-emulsion design allows for rapid release upon contact with water while maintaining controlled hydration during transfer.

### RECOMMENDED APPLICATIONS

- Usage: Suitable for fresh water, produced water, and brines exceeding 150,000 ppm TDS.
- Versatility: Engineered for high shear, elevated salinity, and extended pumping cycles.
- Response: Contributes fluid body to aid particle suspension when a stronger polymer response is desired.
- Dosage: 0.25 – 1.0 gpt for friction reduction; 1.5 – 2.0 gpt for viscosification.

### PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Thick Liquid, Grey to White, Off-White Opaque |
| Charge | Anionic |
| Flash Point | >= 201°F (Closed Cup) |
| Pour Point | 32°F |
| Density @ 20°C | 1.05 - 1.15 kg/L |
| Viscosity @ 25°C | 500 - 3000 cP |
| Free Acrylamide Monomer | < 1000 ppm |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# GEL PRODUCTS

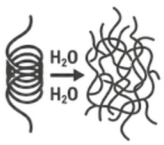
## Viscosity Building & Proppant Suspension Solutions

### GEL PRODUCT LINE

The SmartGel and GS line of liquid slurries is engineered for rapid hydration and robust rheological control. Our advanced suspension technologies are designed to:


**VISCOSITY DEVELOPMENT**

**SOLIDS TRANSPORT**




**RAPID HYDRATION**


**SHEAR STABILITY**

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# GS-400™

## RAPID HYDRATING GUAR SLURRY

### PRODUCT DESCRIPTION

GS-400™ is a fast-hydrating guar slurry engineered for high-performance fracturing and completion operations. The system consists of a 4.0 lb. loading of 40/45 natural guar polymer suspended in an environmentally friendly, non-regulated mineral oil. Formulated with a specialized surfactant package, GS-400™ ensures rapid polymer hydration and high viscosity development, even in demanding field conditions.

### KEY PERFORMANCE ADVANTAGES

- Rapid Hydration: Builds high viscosity quickly to support high-rate pumping schedules.
- Environmental Profile: 0% BTEX chemicals; contains environmentally friendly slurry components.
- Operational Handling: Highly dispersible liquid form allows for precise metering and clean handling compared to dry powders.
- Efficiency: Optimized for systems requiring 9 lb. to 40 lb. loading per 1,000 gallons.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance / Physical State | Tan Viscous Liquid |
| Specific Gravity @25C | 1.067 |
| Density | 8.90 lbs/gal |
| Active Concentration | 4.0 lbs/gal |
| pH | 6.81 |

### TYPICAL PERFORMANCE - 40 LB

| | |
|---|---|
| 3 MINUTES | 40 cps |
| 5 MINUTES | 42 cps |
| 30 MINUTES | 44 cps |
| 60 MINUTES | 45 cps |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# Smart Aphron Gel™

## APHRON GENERATION SYSTEM

### PRODUCT DESCRIPTION

Smart Aphron Gel™ is a field-built, water-based aphron generation system designed to convert controlled gas entrainment into a stable population of fine, recirculatable microbubbles within a structured aqueous phase. It is built sequentially by conditioning fluid, developing low-shear viscosity with xanthan gum, and applying specialized primary and secondary surfactants. The resulting low-solids, highly shear-thinning fluid achieves reduced effective density and stable downhole gas suspension under active circulation without creating coarse, unstable surface foam.

### KEY BENEFITS & FUNCTIONS

- Persistent Microbubble Structure Generates pressure-responsive, recirculatable microbubbles that are significantly finer and more persistent than conventional drilling foams.
- Advanced Density Control Achieves targeted downhole effective density reduction through active fluid circulation, minimizing hydrostatic pressure on depleted reservoirs.
- Superior Fluid Rheology Delivers elevated low-shear-rate viscosity and stable gas suspension while retaining highly manageable bulk fluid circulation parameters.
- Customizable Architecture Engineered as a flexible field-built system that can be adjusted dynamically based on water quality, pH demands, and circulation intensity.

### PHYSICAL PROPERTIES

| Parameter | Target / Typical Field Window |
|---|---|
| System type | Water-based, field-built aphron generation |
| Conditioned water pH | 8.0 - 9.0 before surfactant addition |
| Minimum hydration rest | 20 minutes after xanthan addition |
| Base fluid density before aphron | Approximately 8.3 - 8.4 lb/gal, depending on |
| Target operating density after aphron | 6.6 - 6.8 lb/gal |
| Estimated entrained gas fraction at target | Approximately 18 - 21% v/v at surface |
| Observed dynamic field target | Maintain target density under sustained |
| Appearance after aphron generation | Uniform, fine-bubble aphron gel with no |

### RECOMMENDED APPLICATIONS

- Controlled-Density Drilling Operations
- Depleted Reservoir Matrix Protection
- Low-Solids Fluid Cleanouts
- Microbubble-Based Fluid Architecture

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartGel X™

## XANTHAN SLURRY SWEEP

## PRODUCT DESCRIPTION

SmartGel X™ is a concentrated, stable xanthan-based slurry developed for drill out and wellbore cleanout operations. It is specifically engineered to provide the low-shear rheology required to suspend and transport milled composite debris, sand, and fines. By creating a shear-thinning transport network, SmartGel X™ remains mobile under pump shear but thickens in the annulus to prevent solids fallback and "low-side" bed formation in horizontal laterals.

## RECOMMENDED APPLICATIONS

- Drill Out Ops: Ideal for composite frac plug drill out and milling programs.
- Wellbore Cleanout: Enhances debris transport and annular carrying capacity.
- Gel Sweeps: Effective for intermittent sweeps during circulation to reduce pack-off risk.
- Horizontal Support: Prevents the recirculation of settled debris in lateral sections.

## TREATMENT GUIDELINES

- Typical Dosage: 3 – 5 gallons per 10 barrels of fluid.
- Application: Add through the system with sufficient agitation for uniform dispersion.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Tan Liquid |
| Form | Slurry |
| Specific Gravity @ 25°C | 0.988 - 1.024 |
| Density (lb/gal) | 8.245 - 8.545 |
| Solubility in Water | Dispersible |
| Odor | Mild |
| Freeze Point | 18°F |
| Viscosity @ 25°C | Not Applicable |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

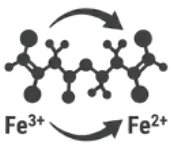
smartchemical SERVICES

# IRON CONTROL

## Chelation & Scale Prevention Solutions

### IRON CONTROL PRODUCT LINE

The SmartFe line of iron control additives is engineered to prevent the precipitation of insoluble iron hydroxides and oxides. Our advanced chelation and sequestering technologies are designed to:




**FERRIC IRON REDUCTION**

**PROPPANT PACK PRESERVATION**

**FORMATION PROTECTION**


**OPERATIONAL COMPATIBILITY**

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# SmartFe 316™

**IRON CONTROL ADDITIVE**

## PRODUCT DESCRIPTION

SmartFe 316™ is a high-performance iron control additive engineered for continuous injection during slickwater hydraulic fracturing operations. It proactive manages dissolved and mobilized iron species generated from formation interaction, tubular contact, and oxygen ingress. It functions through a synergistic acid-complexation mechanism that stabilizes both ferrous and ferric iron, preventing the formation of insoluble hydroxides and oxides that impair permeability and damage proppant packs.

## RECOMMENDED APPLICATIONS

- Usage: Ideal for slickwater hydraulic fracturing and high-rate pumping programs requiring solids-free fluid systems.
- Mechanism: maintains iron in a soluble, non-reactive state to preserve fracture conductivity and proppant pack integrity.
- Compatibility: Fully compatible with friction reducers, surfactants, scale inhibitors, biocides, and clay stabilizers.
- Dosage: Typical dosage is 0.25 – 1.0 gallons per 1,000 gallons (GPT) injected continuously into the mix water stream.

## PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Clear, Colorless |
| Form | Liquid |
| pH (Neat) | 2.4 – 3.4 |
| Specific Gravity @ 25°C | 1.018 – 1.054 |
| Density (lb/gal) | 8.495 – 8.795 |
| Solubility in Water | Complete |
| Freeze Point | 25°F |
| Odor | Mild Organic |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartFe 762™

## MULTIFUNCTIONAL IRON & EMULSION CONTROL

## PRODUCT DESCRIPTION

SmartFe 762™ is a liquid multifunctional additive designed for hydrochloric acid stimulation systems. It combines iron control, surfactant, and non-emulsifier functionalities in a single package. It prevents sludge formation, reduces surface tension for uniform acid distribution, and ensures rapid separation of oil and water phases following treatment. It remains stable and active in acid concentrations up to 28% and temperatures up to 300°F.

## RECOMMENDED APPLICATIONS

- Usage: Matrix acidizing of carbonate or sandstone formations, acid pickling, and scale removal operations.
- Iron Control: Reduces and complexes dissolved iron released from tubulars or minerals to prevent plugging.
- Cleanup: Modifies interfacial tension to allow acid to penetrate deeper and spend more efficiently.
- Dosage: Recommended treat rate is 2 – 5% v/v based on acid volume. Add to HCl before corrosion inhibitor.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear Yellow |
| Physical State | Liquid |
| Specific Gravity @ 25°C | 0.956 – 0.992 |
| Density | 7.986 – 8.286 |
| pH (Neat) | 2.78 – 3.08 |
| Freeze Point | -2°F |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartFe A30™

**PH BUFFER / IRON CONTROL**

## PRODUCT DESCRIPTION

A nominal 30% active aqueous organic-acid solution developed for controlled acidification and pH management.

## RECOMMENDED APPLICATIONS

- Source-water conditioning, iron-sensitive fracturing systems, and completion brines requiring moderate acidification.

## KEY ADVANTAGES

- Suppresses precipitation of iron species (ferric hydroxide, iron carbonate) by maintaining an acidic environment.
- Fully water-soluble, low-residue liquid suitable for batch or continuous injection.
- Compatible with a wide range of water qualities and field-mixing practices.

## TREATMENT GUIDELINES

pH buffering at 0.25–2.0 GPT; Iron-control support at 0.5–5.0 GPT.

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, colorless liquid |
| Form | Liquid |
| Odor | Mild vinegar-like odor |
| Acid Activity | Nominal 30% organic acid |
| pH (neat) | 2.0 - 2.8 |
| Specific Gravity @ 20-25°C | 1.03 - 1.05 |
| Density | 8.55 - 8.75 lb/gal |
| Solubility in Water | Complete |
| Freeze Point | Approximately 15 - 32°F |
| Boiling Range | Approximately 214 - 244° |
| Flash Point | Approximately >= 142°F |
| Viscosity @ 20-25°C | Approximately 1 - 5 cP |

smartchemical SERVICES

# SmartFe A50™

**PH BUFFERING & IRON CONTROL**

## PRODUCT DESCRIPTION

A concentrated 50% aqueous organic-acid treatment designed for rapid pH reduction and practical iron management during fluid preparation.

## RECOMMENDED APPLICATIONS

Hydraulic fracturing systems needing controlled pH reduction and iron management in variable field chemistry.

## KEY ADVANTAGES

- Stabilizes water chemistry and improves additive response by lowering alkalinity.
- Complexes dissolved iron to prevent fallout and deposit formation during stimulation.
- Effective in fresh, brackish, recycled, and produced-water programs.

## TREATEMENT GUIDELINES

Inject upstream of high-turbulence points; dosage based on water analysis and target pH.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, colorless liquid |
| Form | Liquid |
| Organic Acid Activity | 49 - 51% |
| pH (Neat) | 1.0 - 2.0 |
| Specific Gravity @ 20 - 25°C | 1.20 - 1.25 |
| Density (lb/gal) | 10.0 - 10.4 |
| Odor | Odorless to mild |
| Solubility in Water | Complete |
| Freeze Point | Approximately 32°F |
| Viscosity @ 25°C | Approximately 10 - 15 cP |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# PIPE-ON-PIPE

## Advanced Friction Reduction for Extended-Reach and High-Angle Wellbores

### PIPE-ON-PIPE PRODUCT LINE

Engineered specifically to meet the brutal mechanical demands of long-lateral completions and high-intensity drill-outs, our specialized Pipe-on-Pipe lubricants provide premium boundary layer protection where conventional fluids fail. Formulated to withstand extreme shear and temperatures up to 350°F, these high-performance friction reducers molecularly bond to metal surfaces—significantly lowering torque and drag, optimizing weight transfer to the bit, and eliminating the risk of mechanical locking in tight-tolerance well geometries.

**ELITE TORQUE & DRAG REDUCTION**

**PREVENT MECHANICAL LOCKING & STUCK PIPE**

**OPTIMIZED WEIGHT TRANSFER TO THE BIT**

**MAXIMIZED RIG EFFICIENCY & LOWERED NPT**

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# Blue Lube 5®

PIPE-ON-PIPE LUBRICANT
High-Performance Friction Reduction System

## PRODUCT DESCRIPTION

Blue Lube 5® is a field-validated, high-performance pipe-on-pipe lubricant engineered to mitigate severe torque and drag during coiled tubing operations, drill-outs, and extended-reach completions. Utilizing an entirely unique formulation framework, it delivers superior coefficient of friction (CoF) reduction at economical treatment rates as low as 0.25 gal/10 bbl.

Its advanced dual-action mechanism establishes a resilient boundary layer under compressive stress and nanoscale flow enhancement under shear. This prevents metal-on-metal locking, stabilizes torque spikes, and maintains exceptional film integrity under dynamic downhole loads and temperatures up to 350°F.

## RECOMMENDED APPLICATIONS

- Extended-Reach Laterals: Designed to overcome high friction and drag in long-lateral and high-deviation well geometries where traditional lubricants fail.
- Plug Drill-Out & Completion Operations: Optimizes weight transfer and protects downhole assets during high-intensity interventions.
- Coiled Tubing Interventions: Delivers consistent, shear-responsive lubrication across both open-hole and cased-hole runs.
- Mechanical Sticking Mitigation: Highly effective for both continuous injection programs and targeted spot treatments to free stuck strings.

## PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Cobalt Blue |
| Physical State | Liquid |
| Specific Gravity | 0.874 |
| Density | 7.29 lb/gal |
| Operational Temperature Ra | Ambient to 350°F |
| Compatibility | Freshwater, high-TDS brines, divalent-rich waters, 2% KCl, slickwater |
| Thermal Degradation | None observed to 350°F |

## PACKAGING

Blue Lube 5® is available in standard oilfield chemical packaging configurations to accommodate rapid on-site deployment:

- 275-Gallon IBC Totes (Poly or stainless-steel caged)
- 55-Gallon Drums
- Bulk Transport (Available upon request for high-volume operations)

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# Smart Lube 9000™

PIPE-ON-PIPE LUBRICANT

## PRODUCT DESCRIPTION

Smart Lube 9000™ is an advanced, multi-mechanism pipe-on-pipe lubricant engineered to eliminate severe torque and drag during plug drill-outs, casing work strings, and coiled tubing operations in extended-reach laterals. Lab-validated in produced brines exceeding 200,000 ppm TDS, it delivers a superior coefficient of friction (CoF) reduction.

Unlike conventional additives, Smart Lube 9000™ simultaneously deposits four independent, protective film layers at the metal-to-metal interface. This proprietary multi-layer defense ensures continuous, active lubrication across every phase of rotation and reciprocation—withstanding extreme downhole pressures, high shear, and harsh reservoir temperatures up to 350°F.

## RECOMMENDED APPLICATIONS

- Horizontal & Extended-Reach Laterals: Designed to mitigate severe torque and drag in highly deviated well geometries.
- Plug Drill-Out Operations: Optimizes axial and rotational weight transfer to the mill or drill bit, accelerating plug milling times and improving tracking.
- Coiled Tubing & Work String Interventions: Prevents high-torque spikes and micro-welding at tight-tolerance contact points.
- Challenging Fluid Systems: Fully operational across low-viscosity slickwater, heavy divalent brines, linear gels, and high-salinity produced waters.

## PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Dark Brown |
| Form | Viscous Liquid |
| Specific Gravity @ 25°C | 0.923 – 0.964 |
| Density (lb/gal) | 7.744 – 8.044 |
| Freeze Point | 15°F |
| Validated Temperature Ceiling | 350°F |
| Recommended Treat Rate | 0.25 – 0.50 gal / 10 bbl |
| Odor | Mild |

## PACKAGING

Smart Lube 9000™ is available in standard oilfield chemical packaging configurations to accommodate rapid on-site deployment:

- 275-Gallon IBC Totes (Poly or stainless-steel caged)
- 55-Gallon Drums
- Bulk Transport (Available upon request for high-volume operations)

smartchemical SERVICES

# SmartLube 2000™

**PIPE-ON-PIPE & DRILLING LUBRICANT**
HIGH-PERFORMANCE FRICTION REDUCTION SYSTEM

## PRODUCT DESCRIPTION

SmartLube 2000™ is a high-value, high-performance pipe-on-pipe and drilling lubricant concentrate designed to lower frictional resistance in downhole environments with elevated contact pressures. The product conditions steel surfaces to maintain a low-shear boundary layer, reducing torque and drag during sliding and rotation. Formulated for reliable field handling and excellent cold-weather pourability, it ensures smoother mechanical movement and improved operational efficiency across high-deviation and extended-reach wellbores.

## PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Clear Light Yellow |
| Physical State | Liquid |
| Specific Gravity @ 25°C | 0.822 – 0.858 |
| Density | 6.859 – 7.159 lb./gal |
| Freeze Point | 13°F |

## RECOMMENDED APPLICATIONS

- Drilling & Completion Operations: Ideal for drill-outs, cleanouts, and milling interventions characterized by repeated steel-on-steel contact.
- Extended-Reach Wellbores: Lowers frictional resistance to optimize pipe mobility and reduce wear at tool joints and contact points.
- Cold-Weather Environments: Engineered for reliable winter handling, trouble-free metering, and rapid dispersion in low temperatures.
- High-Pressure Contact Zones: Formulated to stabilize erratic torque behavior under heavy mechanical loads.

## PACKAGING

SmartLube 2000™ is available in standard oilfield chemical packaging configurations to accommodate rapid on-site deployment:

- 275-Gallon IBC Totes (Poly or stainless-steel caged)
- 55-Gallon Drums
- Bulk Transport (Available upon request for high-volume operations)

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# SmartLube 7000™

**PIPE-ON-PIPE & DRILLING LUBRICANT**
HIGH-PERFORMANCE FRICTION REDUCTION SYSTEM

## PRODUCT DESCRIPTION

SmartLube 7000™ is a clear, liquid lubricant concentrate engineered to eliminate severe torque and drag in high-contact downhole environments. It actively promotes steel wetting, building a resilient boundary layer at critical contact zones like tool joints, casing interfaces, and coiled tubing strings. This advanced boundary film prevents direct metal-on-metal interaction during sliding and rotation, helping to stabilize erratic torque behavior, enhance mechanical weight transfer, and ensure predictable pipe conveyance across extended-reach wellbores.

## RECOMMENDED APPLICATIONS

- Extended-Reach & Deviated Wellbores: Maximizes conveyance efficiency and minimizes friction-driven torque spikes in long horizontals.
- Plug Drill-Outs & Milling Interventions: Stabilizes mechanical behavior during sliding-to-rotation transitions, speeding up run times and protecting tools.
- Coiled Tubing & Casing Operations: Lowers the risk of mechanical binding and high-load torque excursions at critical contact points.
- Broad Fluid System Utility: Fully disperses and performs across standard drilling and completion fluid types, including freshwater, KCl, and high-TDS field brines.

## PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Clear Light Yellow |
| Physical State | Liquid |
| Specific Gravity @ 25°C | 0.832 – 0.868 |
| Density | 6.944 – 7.244 lb/gal |
| Freeze Point | ~13°F |

## PACKAGING

SmartLube 7000™ is available in standard oilfield chemical packaging configurations to accommodate rapid on-site deployment:

- 275-Gallon IBC Totes (Poly or stainless-steel caged)
- 55-Gallon Drums
- Bulk Transport (Available upon request for high-volume operations)

smartchemical SERVICES

# SCALE INHIBITOR

## Mineral Deposition & Crystal Growth Control

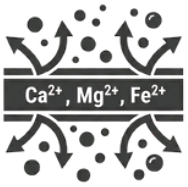
### SCALE INHIBITOR PRODUCT LINE

The SmartScale line of phosphonate and polymeric inhibitors is engineered to prevent the precipitation of carbonate and sulfate scales in high-stress environments. Our advanced stabilization technologies are designed to:

CRYSTAL MORPHOLOGY DISTORTION


THRESHOLD CONTROL

HEAT SHEILD




ION DISPERSENCY

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# SmartScale 1011™

## SULFATE-TUNED SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 1011™ is a liquid scale inhibitor engineered for both production systems and fracturing fluids. It combines high-efficiency threshold performance with crystal-habit modification to prevent nucleation and deposition across a wide range of temperatures. While it provides robust carbonate coverage, it is specifically tuned to suppress low-solubility sulfate scales, most notably barium sulfate $BaSO_4$ and strontium sulfate $SrSO_4$.

### RECOMMENDED APPLICATIONS

- Sulfate Specialist: Lowers effective scaling tendency and interferes with crystal lattice development of persistent sulfates.
- Operational: Compatible with slickwater and hybrid frac designs as well as continuous or batch production treatments.
- Logistics: Single-inhibitor approach simplifies field logistics and inventory management.
- Dosage: Typical treat rate of 0.10 – 0.50 gallons per 1,000 gallons (GPT).

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear Yellow |
| Physical State | Liquid |
| Specific Gravity | 1.022 – 1.058 |
| Density (lb/gal) | 8.528 – 8.828 |
| pH (neat) | 4.60 – 5.60 |
| Freeze Point | 31 °F |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# SmartScale 1012™

## DUAL-ACTION SCALE & IRON CONTROL

## PRODUCT DESCRIPTION

SmartScale 1012™ is a multifunctional fracturing water-treatment additive engineered to control mineral deposition while simultaneously conditioning iron-bearing contaminants. This liquid concentrate combines threshold scale control, particulate stabilization, and dissolved-metal sequestration in a single package. It is specifically designed for use with fresh, brackish, recycled, and produced source waters where mixed-mineral fouling and iron instability are primary concerns.

The product functions through a coordinated mechanism: the scale-control portion suppresses nucleation and crystal growth of carbonate and sulfate salts, while a complementary dispersant package prevents iron solids and destabilized fines from flocculating or bridging under high-rate pumping conditions.

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, Yellow |
| Form | Liquid |
| pH (Neat) | 4.0 – 5.0 |
| Specific Gravity @ 25°C | 1.056 – 1.092 |
| Density (lb/gal) | 8.812 – 9.112 |
| Freeze Point | 0°F |
| Solubility in Water | Complete |

## KEY PERFORMANCE ADVANTAGES

- Multifunctional Chemistry: Combines scale inhibition, iron sequestration, and solids dispersion into one injection point.
- Proactive Iron Management: Binds dissolved iron to limit secondary precipitation and the formation of insoluble iron compounds.
- Solids Dispersion: Maintains suspended particulates in a mobile, non-adherent state to prevent bridging in pore constrictions and proppant packs.
- Operational Efficiency: Reduces the need for separate scale and iron control injection packages in systems with low-to-moderate iron levels.
- Broad Compatibility: Integrates seamlessly into slickwater systems using diverse water sources.

smartchemical SERVICES

# SmartScale 2332™

## DUAL-MECHANISM SCALE INHIBITOR

## PRODUCT DESCRIPTION

SmartScale 2332™ is a synergistic additive combining polymer and phosphonate chemistries for advanced scale and metal ion control. It includes a thermal stabilizing system engineered for high-performance in complex brines and high-temperature downhole environments.

## RECOMMENDED APPLICATIONS

- Performance: Inhibits calcium carbonate, barium sulfate, and magnesium scales.
- Iron Control: Provides effective iron dispersency and fouling prevention.
- Application: Ideal for iron-rich produced water reuse programs.
- Dosage: Typical on-the-fly dosage of 0.1 – 0.5 gal/1000gal.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear dark amber liquid |
| Odor | Mild |
| Solubility in Water | Complete |
| Viscosity @ 25°C | < 20 cP |
| Pour Point | 18°F |
| pH (Neat) | 4.5 – 5.5 |
| Specific Gravity @ 25°C | 1.11 – 1.146 |
| Density (lb/gal) | 9.263 – 9.563 |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# SmartScale 2337™

## MULTI-FUNCTIONAL SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 2337™ combines phosphonate and polymer technologies to deliver broad-spectrum control of carbonate and sulfate scales. It is partially neutralized to ensure compatibility across diverse water chemistries while providing essential metal ion dispersency.

### RECOMMENDED APPLICATIONS

- Iron Management: Prevents deposition and discoloration in high-iron water systems.
- Versatility: Suitable for slickwater and hybrid fracturing in variable environments.
- Mechanism: Dual-mechanism synergy improves overall inhibition and dispersion.
- Dosage: Typical on-the-fly dosage of 0.1 – 0.5 gal/1000gal.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear light amber liquid |
| Odor | Mild |
| Solubility in Water | Complete |
| Viscosity @ 25°C | < 15 cP |
| Pour Point | 30°F |
| pH (Neat) | 4.50 – 5.50 |
| Specific Gravity @ 25°C | 1.018 – 1.054 |
| Density (lb/gal) | 8.495 – 8.795 |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartScale 3217™

## COLD-WEATHER SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 3217™ is a cold-weather fracturing scale inhibitor developed for operations requiring dependable mineral-deposition control and reliable winter handling in a single package. Built around a highly calcium-tolerant threshold-control active carried in a freeze-protected solvent-water system, it remains easy to store, meter, and inject under demanding field conditions.

### RECOMMENDED APPLICATIONS

- Winter Ops: Designed for excellent storage, pumping, and metering performance in cold-weather conditions.
- Brine Tolerance: Suitability for high-TDS and high-hardness environments where conventional treatments may lose effectiveness.
- Protection: Threshold action disrupts nucleation and interferes with crystal growth on iron, tubulars, and pumps.
- Dosage: Typical on-the-fly dosage of 0.1 – 0.5 gallons per 1,000 gallons (GPT).

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear Light Yellow |
| Form | Liquid |
| pH (Neat) | 5.45 - 6.45 |
| Specific Gravity @ 25°C | 0.956 - 0.992 |
| Density (lb/gal) | 7.978 - 8.278 |
| Freeze Point | < -20°F |
| Recommended Treat Rate | 0.1 - 0.5 gal/1,000 gal |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartScale 3320™

## AGGRESSIVE BRINE SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 3320™ is a robust, high-alkalinity scale inhibitor designed for the most aggressive brine environments. With an elevated actives concentration and high-pH buffering, it handles extreme sulfate and carbonate scaling risks.

### RECOMMENDED APPLICATIONS

- Severity: Designed for severe scale conditions and produced water reuse.
- Stabilization: Built-in thermal stabilizer improves durability under heat exposure.
- Efficiency: High-strength formulation for high-rate pumping operations.
- Dosage: Typical on-the-fly dosage of 0.1 – 0.5 gal/1000gal.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear dark amber liquid |
| Odor | Mild |
| Solubility in Water | Complete |
| Viscosity @ 25°C | < 20 cP |
| Pour Point | 11°F |
| pH (Neat) | 5.0 – 6.0 |
| Specific Gravity @ 25°C | 1.138 – 1.174 |
| Density (lb/gal) | 9.487 – 9.797 |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# SmartScale 3325™

## THERMALLY RESILIENT SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 3325™ features a proprietary phosphonate complex formulated for high-temperature fracturing operations. It is partially neutralized to maintain stability in high-salinity and variable pH environments where conventional inhibitors fail.

### RECOMMENDED APPLICATIONS

- Resilience: Ideal for aggressive downhole conditions and harsh chemistries.
- Mechanism: Controls wide-range scales including calcium carbonate and barium sulfate.
- Application: Suitable for continuous or pre-pad scale control.
- Dosage: Typical on-the-fly dosage of 0.1 – 0.5 gal/1000gal.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear dark amber liquid |
| Odor | Mild |
| Solubility in Water | Complete |
| Viscosity @ 25°C | < 20 cP |
| Pour Point | 18°F |
| pH (Neat) | 4.5 – 5.5 |
| Specific Gravity @ 25°C | 1.11 – 1.146 |
| Density (lb/gal) | 9.263 – 9.563 |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartScale 4420™

## POLYMERIC DISPERSANT SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 4420™ is a polymeric scale inhibitor designed for operational versatility in brine-heavy and recycled water. Its dispersant backbone is supported by a thermal stabilizing system to maintain performance under high pressure and temperature.

### RECOMMENDED APPLICATIONS

- Scaling: Highly effective against calcium and magnesium deposits.
- Compatibility: Excellent synergy with recycled and produced water.
- Fluid Types: Suitable for slickwater, hybrid, and crosslinked jobs.
- Dosage: Typical on-the-fly dosage of 0.1 – 0.5 gal/1000gal.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear colorless liquid |
| Odor | Mild |
| Solubility in Water | Complete |
| Viscosity @ 25°C | < 15 cP |
| Pour Point | 18°F |
| pH (Neat) | 4.8 – 5.8 |
| Specific Gravity @ 25°C | 1.09 – 1.126 |
| Density (lb/gal) | 9.096 – 9.396 |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartScale 4427™

## SPECIALIZED POLYMER SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 4427™ is a polymer-based inhibitor with a specialized dispersant backbone that enhances solubility in complex water chemistries. It is partially neutralized for maximum compatibility with other treatment additives during high-rate operations.

### RECOMMENDED APPLICATIONS

- Flow: Promotes scale dispersion and transport to maintain clean flow paths.
- Chemistry: Optimized for multivalent ion control (Calcium/Magnesium).
- Stability: Maintains integrity under a wide range of pH and temperature.
- Dosage: Typical on-the-fly dosage of 0.1 – 0.5 gal/1000gal.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear colorless liquid |
| Odor | Mild |
| Solubility in Water | Complete |
| Viscosity @ 25°C | < 10 cP |
| Pour Point | 31°F |
| pH (Neat) | 4.50 – 5.50 |
| Specific Gravity @ 25°C | 1.11 – 1.146 |
| Density (lb/gal) | 9.263 – 9.563 |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# SmartScale 4640™

## BARIUM & STRONTIUM SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 4640™ is a high-performance liquid scale inhibitor designed for mineral-scale prevention in both production systems and fracturing fluids. Its advanced inhibition system provides high-affinity multisite interaction with divalent cations, allowing the product to significantly delay supersaturation, extend induction time, and suppress the earliest stages of scale nucleation. It is specifically engineered for enhanced suppression of barium sulfate $BaSO_4$ and strontium sulfate $SrSO_4$ —two of the most insoluble and difficult-to-remove oilfield scales.

SmartScale 4640™ disrupts early crystal-lattice development and promotes malformed, non-adherent crystal growth that resists accumulation in perforations, tubulars, and proppant packs. It also provides robust carbonate scale control by modifying crystal habit and promoting dispersion of fine particulates.

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

### RECOMMENDED APPLICATIONS

- Barium & Strontium Suppression: Optimized for $BaSO_4$ and $SrSO_4$ by extending induction time and disrupting nucleation pathways.
- Carbonate Modification: Modifies crystal habit of $CaCO_3$ and $FeCO_3$ to reduce precipitation rates.
- Multisite Cation Binding: Exhibits strong interaction with $Ba^{2+}$, $Sr^{2+}$, $Ca^{2+}$, and $Fe^{2+}$.
- Particulate Dispersion: Enhances mobility of sub-micron scale particles by increasing surface charge and reducing agglomeration.
- Stability: Maintains full activity in high-salinity brines and elevated-temperature environments.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear Dark Amber |
| Physical State | Liquid |
| Specific Gravity @ 25°C | 1.053 (1.034 – 1.070) |
| Density | 8.787 (8.637 – 8.937) |
| pH (Neat) | 4.61 (4.5 – 4.8) |
| Freeze Point | 25 °F |

smartchemical SERVICES

# SmartScale 5045™

## COMBINATION ACTIVE SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 5045™ is a high-performance combination active scale inhibitor engineered to provide exceptional control in water systems with extreme scaling potential. The formulation utilizes a sulfonated polymer that enhances product distribution through high-mineral fluids by increasing hydrophilicity and thermal stability. The phosphonate component is specifically designed for high stability in the presence of iron and calcium, remaining active across a wide range of pH and temperature profiles.

SmartScale 5045™ employs a triple-action inhibition mechanism:

1. Crystal Morphology: Distorting crystal growth to prevent stable lattice formation.
2. Chelation: Sequestering scale-forming ions in solution.
3. Adsorption: Coating mineral surfaces to prevent particle agglomeration and adhesion.

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

### RECOMMENDED APPLICATIONS

- Superior Thermal Stability: Maintains performance in high-temperature downhole environments.
- Mineral Tolerance: Remains fully functional in high iron and high calcium environments.
- Broad Spectrum: Effective against both carbonate and sulfate scale species.
- Iron Dispersant: Actively keeps iron-based particulates in suspension to prevent fouling.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear Light Yellow |
| Density (@ 25°C) | 8.753 (8.603 – 8.903) lbs./gal |
| Specific Gravity (@ 25°C) | 1.049 (1.030 – 1.066) |
| pH (5% in Water) | 2.78 (2.63 – 2.93) |

smartchemical SERVICES

# SmartScale 5136™

## PHOSPHONATE SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 5136™ is a highly effective, phosphonate sequestering scale inhibitor engineered to provide superior protection against carbonate and sulfate scales. It is designed for durability in harsh environments, displaying excellent calcium and iron tolerance even at elevated downhole temperatures.

### RECOMMENDED APPLICATIONS

- Usage: Continuous injection, squeeze treatments, or as a fracturing additive.
- Scale Control: Prevents build-up of common oilfield mineral scales.
- Tolerance: High iron and calcium tolerance for stable performance in complex brines.
- Dosage: Typically used at a concentration of 0.15 to 1.0 gal/1000gal.

### PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Light Yellow Liquid |
| Solubility in Water | Complete |
| Density | 8.33 - 8.83 lbs./gal |
| Specific Gravity (@25C) | 0.998 - 1.058 |
| pH | 5.64 - 5.94 |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartScale 5180™

## POLYCARBOXYLATE SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 5180™ is a high-performance polycarboxylate scale inhibitor that utilizes both sequestration and crystal morphology modification to prevent carbonate and sulfate scale formation. It is engineered for stability in high-temperature environments.

### RECOMMENDED APPLICATIONS

- Mechanism: Prevents scale through crystal distortion and iron dispersion.
- Versatility: Suitable for continuous injection, squeeze, or fracturing applications.
- Compatibility: Exhibits robust calcium and iron tolerance.
- Dosage: Typically used at a concentration of 0.15 to 1.0 gal/1000gal.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear Liquid |
| Solubility in Water | Complete |
| Density | 8.361 – 8.661 lbs./gal |
| Specific Gravity (@25C) | 1.002 – 1.038 |
| pH | 5.13 – 5.43 |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartScale 8890™

## POLYMERIC SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 8890™ is a low-dosage, water-based polymeric scale inhibitor developed for hydraulic fracturing operations where clean, efficient mineral scale control is needed without materially increasing ionic loading. centered on a water-soluble threshold polymer, it manages scale through crystal-growth interference and particulate dispersion, making it well suited for continuous treatment of source water and frac fluid systems.

### RECOMMENDED APPLICATIONS

- Mechanism: Disrupted crystal development reduces the tendency for tightly packed, adherent deposits to build on metal surfaces.
- Performance: Keeps incipient inorganic precipitates smaller, less ordered, and easier to transport.
- Versatility: Especially well-aligned with calcium carbonate and calcium sulfate control in fresh, low-TDS, or recycled water.
- Dosage: Typical on-the-fly dosage of 0.1 – 0.5 gallons per 1,000 gallons (GPT).

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear Colorless |
| Form | Liquid |
| pH (Neat) | 4.25 - 5.0 |
| Specific Gravity @ 25°C | 0.998 - 1.024 |
| Density (lb/gal) | 8.253 - 8.553 |
| Freeze Point | 32°F |
| Recommended Treat Rate | 0.1 - 0.5 gal/1,000 gal |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartScale 9070™

## SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 9070™ is a liquid scale inhibitor for production systems and fracturing fluids. It provides threshold, crystal-modifying, and dispersive effects to prevent mineral scale growth and deposition across diverse water chemistries.

While highly effective against standard oilfield carbonates, it is specifically optimized for low-solubility sulfate scales, such as barium sulfate (BaSO4) and strontium sulfate (SrSO4), which resist acid removal and quickly plug flow paths.

### STORAGE, HANDLING & OPERATIONAL NOTES

- Oxidizers: When oxidizers are present, dose upstream and verify sequencing via yard testing.
- Optimization: Confirm performance using jar tests, dynamic loop testing, or residual monitoring.
- Storage: Keep between 40-90° F (4-32° C). Protect from freezing; if frozen, warm to ambient temperature and mix thoroughly.
- Agitation: Agitate tanks or totes before use and periodically during long-term storage.
- Safety: Refer to the product SDS for appropriate PPE and spill-response procedures.

### DOSAGE & PACKAGING

- Typical Treat Rate: 0.10–0.50 gallons per 1,000 gallons (Production & Fracturing), optimized to scaling severity.
- Packaging: Available in 55-gallon drums, 275-gallon totes, and bulk.

### KEY BENEFITS & APPLICATIONS

- Production Systems: Provides continuous or batch inhibition to stop sulfate and carbonate co-precipitation during water blending, pressure drops, and temperature shifts.
- Fracturing Operations: Applied on-the-fly to maintain clean flow through perforations and proppant packs during mixing, pumping, flowback, and early production.
- Targeted Sulfate Control: Disrupts (BaSO4) lattice development at its earliest stages to reduce the deposition of highly tenacious scales.
- Carbonate & Solids Dispersion: Modifies crystal morphology to prevent calcium and iron carbonates from adhering to metal surfaces.
- System Compatibility: Fully compatible with slickwater, hybrid fracturing systems, and standard production chemicals.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear Yellow |
| Physical State | Liquid |
| Specific Gravity @ 25°C | 1.010 – 1.046 |
| Density | 8.429 – 8.729 |
| pH (Neat) | 4.09 – 5.09 |
| Freeze Point | 27 °F |

smartchemical SERVICES

# SmartScale 9748™

## HIGH-CALCIUM BRINE SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 9748™ is a low-alkalinity, high-efficiency scale inhibitor designed for high-calcium brine systems. Built on a next-generation phosphorus-based framework, it delivers superior calcium tolerance and high thermal stability, making it an ideal choice for produced water and recycled systems. SmartScale 9748™ is well-suited for continuous low-dose injection in tight formations and high-TDS environments.

### KEY PERFORMANCE ADVANTAGES

- Exceptional Calcium Tolerance: Maintains performance in high-brine and high-hardness systems.
- Broad Spectrum: Effective against both carbonate and sulfate scale formation.
- Thermal Stability: Phosphorus-based technology resists degradation in harsh downhole conditions.
- System Compatibility: Low free alkali content improves compatibility with sensitive fracturing fluids.
- Operational Efficiency: Ideal for continuous injection into high-TDS water streams.

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear light yellow liquid |
| Odor | Mild |
| Solubility in Water | Complete |
| Viscosity @ 25°C | < 10 cP |
| Pour Point | 30°F |
| pH (Neat) | 5.0 – 6.0 |
| Specific Gravity @ 25°C | 1.018 – 1.054 |
| Density (lb/gal) | 8.495 – 8.795 |

### TREATMENT GUIDELINES

- Typical Dosage: 0.1 – 0.5 gallons per 1,000 gallons (GPT).
- Application: Inject into base water upstream of blender or mix tank.
- Compatibility: Fully compatible with common frac additives and friction reducers.

smartchemical SERVICES

# SmartScale 9848™

## CONCENTRATED HIGH-TEMP SCALE INHIBITOR

### PRODUCT DESCRIPTION

SmartScale 9848™ is a concentrated, high-performance scale inhibitor formulated with a next-generation phosphorus-based active. Designed to excel in high-calcium and high-temperature environments, SmartScale 9848™ features a built-in thermal stabilizer to maintain performance under field stress. Its partially neutralized structure allows for broad compatibility across fluid systems while delivering superior tolerance to calcium and iron.

### KEY PERFORMANCE ADVANTAGES

- High-Strength Formula: Exceptional calcium tolerance for concentrated scaling environments.
- Mixed Scale Inhibition: Inhibits carbonate, sulfate, and mixed scale formations.
- Advanced Chemistry: Phosphorus actives resist chemical breakdown in harsh systems.
- Thermal Resilience: Built-in thermal stabilizer supports elevated temperature use.
- Stability: Partially neutralized for improved stability and system compatibility.

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear light yellow liquid |
| Odor | Mild |
| Solubility in Water | Complete |
| Viscosity @ 25°C | < 15 cP |
| Pour Point | 15°F |
| pH (Neat) | 5.20 – 6.20 |
| Specific Gravity @ 25°C | 1.112 – 1.148 |
| Density (lb/gal) | 9.28 – 9.58 |

### TREATMENT GUIDELINES

- Typical Dosage: 0.1 – 0.5 gallons per 1,000 gallons (GPT).
- Application: Inject into base water upstream of blender or mix tank.
- Compatibility: Fully compatible with common fracturing additives and friction reducers.

# SPECIALTY / OTHER

## Advanced Production & Completion Solutions

### SPECIALTY / OTHER PRODUCT LINE:

The Specialty / Other product line from Smart Chemical Services encompasses a targeted suite of elite chemistry formulations engineered to overcome critical operational roadblocks across well completion, flow assurance, and production management. Rather than relying on rigid generic baselines, this portfolio is defined by advanced response kinetics and precise chemical delivery mechanisms. This category features engineered chemical solutions across three essential technological sectors:

1. **Composite Plug Dissolvers** High-strength, targeted chemical frameworks designed to rapidly compromise the structural and metallic load paths of downhole dissolvable composite frac plugs. These systems are finely tuned for specific wellbore thermal ranges and water salinities, ensuring complete plug fragmentation without mechanical mill-out intervention.

2. **$H_2S$ Scavengers** Advanced non-scale liquid scavenging agents developed to achieve rapid hydrogen sulfide extraction from natural gas and multi-phase fluid streams. These systems form non-reversible, non-oxidizing chemical bonds with $H_2S$, systematically neutralizing the gas while strictly preventing the formation of pipeline-fouling solid byproducts.

3. **Specialized Solvents** High-performance clearing matrices built to disperse complex paraffin waxes, heavy asphaltic sludges, and scale blockages. These formulations preserve fluid system parameters and maintain optimal matrix surface wetting across a wider spectrum of bottomhole environments.

smartchemical SERVICES

# HSW 1014S™

**NON-SCALE H2S SCAVENGER**

## PRODUCT DESCRIPTION

HSW 1014S™ is an advanced liquid H2S scavenger formulated to quickly eliminate hydrogen sulfide in natural gas systems. Engineered with faster kinetics and increased capacity compared to standard scavengers, it targets H2S without forming problematic solids. It also includes an integrated scale inhibitor to prevent precipitation caused by pH alterations.

## KEY BENEFITS

- Superior Performance: Delivers excellent H2S removal capacity and faster reaction kinetics than MEA Triazine.
- Zero Solids: Formulated to eliminate the risk of solid byproduct formation during the reaction.
- Stable Reaction: Provides a non-oxidizing, non-reversible chemical bond with H2S.
- Extreme Cold Weather Performance: Both neat and spent scavenger maintain a low pour point of -40°F.
- Flexible Delivery: Readily available in bulk truckloads or intermediate bulk container (IBC) totes.

## RECOMMENDED APPLICATIONS

Designed for easy implementation within existing operations and versatile application methods:

- Continuous Injection Systems
- Batch Tower Applications
- Flooded Systems
- Drill-Out Operations

## PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Physical State | Liquid |
| Color | Clear to light straw yellow |
| Odor | Distinct |
| Density | 7.71 lbs./gal |
| pH | 9.0 - 10.5 |

## PACKAGING

Typical packaging is provided in 330 gal totes. Other dimensions are available upon request.

SPECIALTY | SOLVENT

# MS 4120™

## MUTUAL SOLVENT

## PRODUCT DESCRIPTION

TBD

## KEY BENEFITS & FUNCTIONS

- Oxide Film Disruption: Aggressively breaks through tough, passivating aluminum oxide films that halt or severely delay regular chemical dissolution processes.
- High-Alloy Performance: Tailored to handle resilient aluminum-bearing and high-alloy metallics where conventional organic systems fail to establish a reactive footprint.
- Rapid Integrity Loss: Triggers rapid loss of downhole anchoring force and seal decompression, converting metal components into passable, flowback-compatible debris.
- Global Architecture Compatibility: Maintains consistent wetting across metallic, elastomeric, and composite interfaces without compromising downstream system fluids.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, Colorless |
| Form | Liquid |
| pH (Neat) | < 1 |
| Specific Gravity @ 25°C | 1.083 – 1.119 |
| Density (lb/gal) | 9.038 – 9.338 |
| Solubility in Water | Complete |
| Freeze Point | < –15°F |

## RECOMMENDED APPLICATIONS

Deployed as a specialized post-fracture dissolver pill or cleanout treatment in vertical, deviated, or horizontal wellbores. Typical treatment rate ranges from 5–12% by volume of total treatment fluid. Can be batch mixed or injected continuously as required by the downhole timeframe.

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# PDO 7051™

## PARAFFIN DISPERSANT

## PRODUCT DESCRIPTION

PDO 7051™ is a synergistic blend of advanced paraffin dispersants carried in a high-performance solvent matrix designed for downhole injection above the oil cloud point. It prevents paraffinic crystallization and nucleation, eliminating the source of flow restrictions and equipment blockages. Engineered to achieve complete dispersancy at lower chemical volumes than standalone solvent packages, it features an integrated iron control system that strips iron solids from the oil phase and routes them cleanly into the water phase

## KEY BENEFITS & FUNCTIONS

- High-Efficiency Dispersancy Achieves complete downhole dispersion of paraffinic materials with significantly lower total chemical volumes than conventional solvent packages.
- Anti-Nucleation Chemistry Inhibits the baseline nucleation of paraffin molecules, preventing the formation of hard organic blockages and restoring restricted fluid pathways.
- Integrated Iron Management Features a specialized iron control package designed to extract trapped iron solids from the oil layer and partition them into the water layer.
- Versatile System Treatment Provides exceptional application flexibility, performing reliably across continuous downhole injection networks or high-volume truck treatment programs.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Light Amber, Liquid |
| Specific Gravity | 0.85 |
| pH (1%) | 9 |
| Density | 7.1 lbs/gal |
| Flash Point (TCC) | 32°F |
| Boiling Point | 156°F |
| Freezing Point | Below 0°F |

## RECOMMENDED APPLICATIONS

- Continuous Downhole Paraffin Remediation
- Flow Assurance and Pipeline Maintenance
- Batch Truck Treating Compounds
- Matrix Organic Cleansing

## APPLICATION DOSAGE

Continuous Injection: Formulated for continuous treatment at concentrations between 100 and 2,500 ppm, tailored directly to the severity of local paraffin accumulation.

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSolv 2771™

**DISSOLVABLE COMPOSITE PLUG DISSOLUTION SYSTEM**

## PRODUCT DESCRIPTION

SmartSolv 2771™ is a high-strength, acidified dissolver system engineered to accelerate the loss of mechanical integrity in dissolvable composite frac plugs deployed in low- to moderate-temperature wellbores (~70°F to 200°F) utilizing fresh to moderately saline water systems. It employs a balanced organic-acid matrix combined with a controlled chloride source to promote sustained electrochemical dissolution of magnesium alloys while minimizing the formation of passivating films.

## KEY BENEFITS & FUNCTIONS:

- Optimized Mild-Thermal Activity: Engineered specifically to activate and sustain magnesium alloy degradation within lower temperature bands where conventional dissolvers stagnate.
- Precipitation Suppression: An integrated chelation framework stabilizes dissolved metallic species, actively suppressing secondary magnesium hydroxide re-precipitation.
- Selective Metalloid Focus: Targets the load-bearing metal architecture directly, causing structural collapse and controlled composite fragmentation without attempting to break down inert resins.
- Flexible Treatment Delivery: Suitable for vertical, deviated, and horizontal wellbores; readily available in 55-gallon drums, 275-gallon totes, and bulk supply.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, Colorless |
| Form | Liquid |
| pH (Neat) | < 1 |
| Specific Gravity @ 25°C | 1.068 – 1.104 |
| Density (lb/gal) | 8.913 – 9.213 |
| Solubility in Water | Complete |
| Freeze Point | < –15°F |

## RECOMMENDED APPLICATIONS

Designed as a post-fracture mechanical mill-out alternative or cleanout pill. Can be batch-mixed or injected completely on-the-fly. The typical treat rate is 5–10% by volume of total treatment fluid, adjusted for downhole temperature, water chemistry, and plug metallurgy.

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSolv 2772™

## DISSOLVABLE COMPOSITE PLUG DISSOLUTION SYSTEM

## PRODUCT DESCRIPTION

SmartSolv 2772™ is a high-performance chemical dissolver developed to promote controlled disengagement of dissolvable composite frac plugs under elevated thermal and saline conditions. Optimized for higher-temperature environments and moderate- to high-TDS water systems, it utilizes a refined organic-acid system paired with a moderated chloride source to sustain electrochemical alloy dissolution while preventing localized passivation.

## KEY BENEFITS & FUNCTIONS

- High-Temperature Stability: Provides highly stable dissolution behavior and uniform surface wetting at elevated bottomhole temperatures without excessive gas evolution.
- Brine & Salinity Compatibility: Performs reliably across moderate- to high-salinity water systems, resisting the interference often caused by high-TDS baseline fluids.
- Reduced Passivation Risks: Advanced solvent architecture keeps metal ions mobile in solution, preventing secondary solids and scale formation from fouling downstream paths.
- Single-Phase Formulation: Fully soluble, single-phase liquid system that mixes cleanly and is entirely compatible with common completion, stimulation, and flowback chemistries.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, Colorless |
| Form | Liquid |
| pH (Neat) | < 1 |
| Specific Gravity @ 25°C | 1.07 – 1.106 |
| Density (lb/gal) | 8.929 – 9.229 |
| Solubility in Water | Complete |
| Freeze Point | < –15°F |

## RECOMMENDED APPLICATIONS

Applied directly as a post-fracture cleanout pill or continuous on-the-fly injection during completion operations. Supports non-mechanical plug removal strategies across horizontal and deviated segments. Available in 55-gallon drums, 275-gallon totes, and bulk volumes.

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSolv 2773™

## DISSOLVABLE COMPOSITE PLUG DISSOLUTION & PASSIVATION-BREAKING SYSTEM

## PRODUCT DESCRIPTION

SmartSolv 2773™ is a high-intensity dissolver system formulated to overcome severe passivation-controlled failure modes encountered during the dissolution of slow-reacting plugs. Specifically engineered for aluminum-based or high-alloy metallic components, it employs a strongly acidified reaction environment supported by a targeted chloride source to disrupt protective oxide layers and re-initiate alloy dissolution.

## KEY BENEFITS & FUNCTIONS

- Oxide Film Disruption: Aggressively breaks through tough, passivating aluminum oxide films that halt or severely delay regular chemical dissolution processes.
- High-Alloy Performance: Tailored to handle resilient aluminum-bearing and high-alloy metallics where conventional organic systems fail to establish a reactive footprint.
- Rapid Integrity Loss: Triggers rapid loss of downhole anchoring force and seal decompression, converting metal components into passable, flowback-compatible debris.
- Global Architecture Compatibility: Maintains consistent wetting across metallic, elastomeric, and composite interfaces without compromising downstream system fluids.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, Colorless |
| Form | Liquid |
| pH (Neat) | < 1 |
| Specific Gravity @ 25°C | 1.083 – 1.119 |
| Density (lb/gal) | 9.038 – 9.338 |
| Solubility in Water | Complete |
| Freeze Point | < –15°F |

## RECOMMENDED APPLICATIONS

Deployed as a specialized post-fracture dissolver pill or cleanout treatment in vertical, deviated, or horizontal wellbores. Typical treatment rate ranges from 5–12% by volume of total treatment fluid. Can be batch mixed or injected continuously as required by the downhole timeframe.

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SURFACTANTS

## Wettability Alteration & Flowback Enhancement

### SURFACTANT PRODUCT LINE

The SmartSurf line of non-emulsifiers and microemulsions is engineered to reduce capillary pressure and optimize hydrocarbon recovery. Our advanced surface-active chemistries are designed to:

**WETTABILITY SHIFT**

**IFT REDUCTION**


**PHASE SEPARATION**

**MATRIX PENETRATION**

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smartchemical SERVICES

# SmartSurf 1060™

**SURFACTANT & NON-EMULSIFIER**

## PRODUCT DESCRIPTION

SmartSurf 1060™ is a high-performance non-emulsifier designed to break and prevent persistent emulsions during flowback and cleanup operations. Formulated for on-the-fly fracturing applications, it disrupts emulsion films formed between frac fluid and hydrocarbons, promoting cleaner separation and improved hydrocarbon release. Its rapid-action solvent-surfactant blend is compatible with high-rate chemical programs and prevents carryover of surfactant residues into production.

## RECOMMENDED APPLICATIONS

- Usage: Fracturing jobs with high potential for emulsion formation.
- Cleanup: Ideal for post-frac cleanup and flowback fluid optimization.
- Compatibility: Compatible with methanol- or water-based frac fluid systems.
- Dosage: Typical on-the-fly dosage is 0.1 – 0.5 gallons per 1,000 gallons (GPT).

## PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Clear colorless liquid |
| Odor | Solvent like |
| Solubility in Water | Complete |
| Viscosity @ 25°C | < 10 cP |
| Pour Point | <-10°F |
| pH (Neat) | 9.8 - 10.6 |
| Specific Gravity @ 25°C | 0.962 – 0.997 |
| Density (lb/gal) | 8.028 – 8.328 |

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSurf 1100™

## NONIONIC SURFACTANT

### PRODUCT DESCRIPTION

SmartSurf 1100™ is a nonionic surfactant formulated to enhance hydrocarbon recovery and flowback efficiency in unconventional reservoirs. Utilizing a balanced surface activity system, it improves wettability alteration and reduces capillary pressure, promoting the release of trapped hydrocarbons within tight rock matrices. Its design prevents the formation of emulsions and exhibits inherently low foaming tendencies.

### RECOMMENDED APPLICATIONS

- Usage: Tight oil and shale gas formations requiring enhanced recovery.
- Mechanism: Reduces capillary pressure for improved hydrocarbon mobility.
- Safety: Non-emulsifying and non-foaming properties reduce operational issues.
- Dosage: Typical on-the-fly dosage is 0.5 – 2.0 gallons per 1,000 gallons (GPT).

### PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Clear colorless liquid |
| Odor | Mild alcohol-like |
| Solubility in Water | Complete |
| Viscosity @ 25°C | < 10 cP |
| Pour Point | <-40°F |
| pH (Neat) | 6.0 – 7.0 |
| Specific Gravity @ 25°C | 0.941 – 0.977 |
| Density (lb/gal) | 7.852 – 8.152 |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSurf 2100™

## CONCENTRATED NONIONIC SURFACTANT

### PRODUCT DESCRIPTION

SmartSurf 2100™ is a concentrated nonionic surfactant engineered to accelerate hydrocarbon recovery and improve flowback in tight formations. Its advanced surfactant system delivers rapid wettability alteration and deep matrix penetration, effectively reducing interfacial tension and capillary binding. It offers low-foam and non-emulsifying performance to maximize recovery.

### RECOMMENDED APPLICATIONS

- Efficiency: Higher active concentration for increased treatment efficiency.
- Versatility: Performs in fresh, brine, and produced water environments.
- Recovery: Alters wettability and enhances desorption of trapped hydrocarbons.
- Dosage: Typical on-the-fly dosage is 0.5 – 2.0 gallons per 1,000 gallons (GPT).

### PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Clear colorless liquid |
| Odor | Mild alcohol-like |
| Solubility in Water | Complete |
| Viscosity @ 25°C | < 10 cP |
| Pour Point | <-40°F |
| pH (Neat) | 6.0 – 7.0 |
| Specific Gravity @ 25°C | 0.941 – 0.977 |
| Density (lb/gal) | 7.852 – 8.152 |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSurf 3350™

## MICROEMULSION SURFACTANT SYSTEM

### PRODUCT DESCRIPTION

SmartSurf 3350™ is a microemulsion surfactant system designed to enhance flowback and reduce capillary trapping. Formulated with an ultra-dispersed surfactant and solvent system, it forms stable microemulsions that rapidly penetrate tight pore structures. It accelerates cleanup by reducing formation damage caused by persistent water blocks and emulsion films.

### RECOMMENDED APPLICATIONS

- Mechanism: Forms ultra-fine microemulsions for deep pore matrix penetration.
- Usage: Tight shale and low-permeability formations with low flowback efficiency.
- Operational: Non-emulsifying and low-foaming design ensures clean flowback.
- Dosage: Typical on-the-fly dosage is 0.5 – 2.0 gallons per 1,000 gallons (GPT).

### PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Clear colorless liquid |
| Odor | Citrus solvent-like |
| Solubility in Water | Complete |
| Viscosity @ 25°C | < 10 cP |
| Pour Point | 32°F |
| pH (Neat) | 10.0 – 11.0 |
| Specific Gravity @ 25°C | 0.977 – 1.013 |
| Density (lb/gal) | 8.153 – 8.453 |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSurf 3520™

## FRACTURING & RE-FRACTURING SURFACTANT

### PRODUCT DESCRIPTION

SmartSurf 3520™ is a high-efficiency aqueous surfactant designed for slickwater fracturing and re-fracturing applications. It is engineered to function under extreme turbulence and shear, enabling effective delivery to fracture faces where oil films and mixed-wet conditions can impair stimulation efficiency. It weakens oil adhesion to pore walls to reduce capillary pressure.

### RECOMMENDED APPLICATIONS

- Re-Frac: Assists in re-conditioning oil-wet near-wellbore regions in mature wells.
- Production: Supports faster load recovery and reduced water blocking.
- Interfacial Behavior: Exhibits cationic interfacial behavior; reduces contact angle by ~52%.
- Dosage: Typical treat rate is 0.5 – 1.0 GPT.

### PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Clear to Opaque Liquid |
| Physical State | Liquid |
| Specific Gravity @ 25°C | 0.964 - 1.0 |
| Density | 8.045 - 8.345 lb/gal |
| pH (Neat) | 9.62 - 10.62 |
| Freeze Point | 16 °F |
| Typical Treat Rate | 0.5 - 1.0 gpt |
| Solubility | Dispersible in Water |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSurf 8840™

## SLICKWATER FRACTURING SURFACTANT

### PRODUCT DESCRIPTION

SmartSurf 8840™ is a high-performance surfactant system designed for continuous injection during slickwater fracturing to improve fluid recovery and accelerate flowback. It addresses capillary forces by simultaneously reducing surface tension, interfacial tension, and contact angle. It is specifically balanced to deliver these benefits without introducing foam or emulsion risk.

### RECOMMENDED APPLICATIONS

- Fluid Mobility: Improves water mobility and promotes efficient fluid displacement.
- Safety: Inherently non-emulsifying even under high shear and high salinity.
- Application: Suitable for use from pad through flush stages.
- Dosage: Typical treat rate is 0.5 – 2.0 gallons per 1,000 gallons (GPT).

### PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Appearance | Clear Yellow |
| Physical State | Liquid |
| Specific Gravity @ 25°C | 0.960 – 0.996 |
| Density | 8.019 – 8.319 lb/gal |
| pH (Neat) | 10.13 – 10.43 |
| Freeze Point | 15°F |
| Solubility in Water | Complete |

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

# SPECIALTY / OTHER

## Advanced Production & Completion Solutions

### SPECIALTY / OTHER PRODUCT LINE:

The Specialty / Other product line from Smart Chemical Services encompasses a targeted suite of elite chemistry formulations engineered to overcome critical operational roadblocks across well completion, flow assurance, and production management. Rather than relying on rigid generic baselines, this portfolio is defined by advanced response kinetics and precise chemical delivery mechanisms. This category features engineered chemical solutions across three essential technological sectors:

1. **Composite Plug Dissolvers** High-strength, targeted chemical frameworks designed to rapidly compromise the structural and metallic load paths of downhole dissolvable composite frac plugs. These systems are finely tuned for specific wellbore thermal ranges and water salinities, ensuring complete plug fragmentation without mechanical mill-out intervention.

2. **$H_2S$ Scavengers** Advanced non-scale liquid scavenging agents developed to achieve rapid hydrogen sulfide extraction from natural gas and multi-phase fluid streams. These systems form non-reversible, non-oxidizing chemical bonds with $H_2S$, systematically neutralizing the gas while strictly preventing the formation of pipeline-fouling solid byproducts.

3. **Specialized Solvents** High-performance clearing matrices built to disperse complex paraffin waxes, heavy asphaltic sludges, and scale blockages. These formulations preserve fluid system parameters and maintain optimal matrix surface wetting across a wider spectrum of bottomhole environments.

smartchemical SERVICES

# HSW 1014S™

**NON-SCALE H2S SCAVENGER**

## PRODUCT DESCRIPTION

HSW 1014S™ is an advanced liquid H2S scavenger formulated to quickly eliminate hydrogen sulfide in natural gas systems. Engineered with faster kinetics and increased capacity compared to standard scavengers, it targets H2S without forming problematic solids. It also includes an integrated scale inhibitor to prevent precipitation caused by pH alterations.

## KEY BENEFITS

- Superior Performance: Delivers excellent H2S removal capacity and faster reaction kinetics than MEA Triazine.
- Zero Solids: Formulated to eliminate the risk of solid byproduct formation during the reaction.
- Stable Reaction: Provides a non-oxidizing, non-reversible chemical bond with H2S.
- Extreme Cold Weather Performance: Both neat and spent scavenger maintain a low pour point of -40°F.
- Flexible Delivery: Readily available in bulk truckloads or intermediate bulk container (IBC) totes.

## RECOMMENDED APPLICATIONS

Designed for easy implementation within existing operations and versatile application methods:

- Continuous Injection Systems
- Batch Tower Applications
- Flooded Systems
- Drill-Out Operations

## PHYSICAL PROPERTIES

| Parameter | Value |
|---|---|
| Physical State | Liquid |
| Color | Clear to light straw yellow |
| Odor | Distinct |
| Density | 7.71 lbs./gal |
| pH | 9.0 - 10.5 |

## PACKAGING

Typical packaging is provided in 330 gal totes. Other dimensions are available upon request.

smartchemical SERVICES

# MS 4120™

## MUTUAL SOLVENT

## PRODUCT DESCRIPTION

TBD

## KEY BENEFITS & FUNCTIONS

- Oxide Film Disruption: Aggressively breaks through tough, passivating aluminum oxide films that halt or severely delay regular chemical dissolution processes.
- High-Alloy Performance: Tailored to handle resilient aluminum-bearing and high-alloy metallics where conventional organic systems fail to establish a reactive footprint.
- Rapid Integrity Loss: Triggers rapid loss of downhole anchoring force and seal decompression, converting metal components into passable, flowback-compatible debris.
- Global Architecture Compatibility: Maintains consistent wetting across metallic, elastomeric, and composite interfaces without compromising downstream system fluids.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, Colorless |
| Form | Liquid |
| pH (Neat) | < 1 |
| Specific Gravity @ 25°C | 1.083 – 1.119 |
| Density (lb/gal) | 9.038 – 9.338 |
| Solubility in Water | Complete |
| Freeze Point | < –15°F |

## RECOMMENDED APPLICATIONS

Deployed as a specialized post-fracture dissolver pill or cleanout treatment in vertical, deviated, or horizontal wellbores. Typical treatment rate ranges from 5–12% by volume of total treatment fluid. Can be batch mixed or injected continuously as required by the downhole timeframe.

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# PDO 7051™

## PARAFFIN DISPERSANT

## PRODUCT DESCRIPTION

PDO 7051™ is a synergistic blend of advanced paraffin dispersants carried in a high-performance solvent matrix designed for downhole injection above the oil cloud point. It prevents paraffinic crystallization and nucleation, eliminating the source of flow restrictions and equipment blockages. Engineered to achieve complete dispersancy at lower chemical volumes than standalone solvent packages, it features an integrated iron control system that strips iron solids from the oil phase and routes them cleanly into the water phase

## KEY BENEFITS & FUNCTIONS

- High-Efficiency Dispersancy Achieves complete downhole dispersion of paraffinic materials with significantly lower total chemical volumes than conventional solvent packages.
- Anti-Nucleation Chemistry Inhibits the baseline nucleation of paraffin molecules, preventing the formation of hard organic blockages and restoring restricted fluid pathways.
- Integrated Iron Management Features a specialized iron control package designed to extract trapped iron solids from the oil layer and partition them into the water layer.
- Versatile System Treatment Provides exceptional application flexibility, performing reliably across continuous downhole injection networks or high-volume truck treatment programs.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Light Amber, Liquid |
| Specific Gravity | 0.85 |
| pH (1%) | 9 |
| Density | 7.1 lbs/gal |
| Flash Point (TCC) | 32°F |
| Boiling Point | 156°F |
| Freezing Point | Below 0°F |

## RECOMMENDED APPLICATIONS

- Continuous Downhole Paraffin Remediation
- Flow Assurance and Pipeline Maintenance
- Batch Truck Treating Compounds
- Matrix Organic Cleansing

## APPLICATION DOSAGE

Continuous Injection: Formulated for continuous treatment at concentrations between 100 and 2,500 ppm, tailored directly to the severity of local paraffin accumulation.

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSolv 2771™

**DISSOLVABLE COMPOSITE PLUG DISSOLUTION SYSTEM**

## PRODUCT DESCRIPTION

SmartSolv 2771™ is a high-strength, acidified dissolver system engineered to accelerate the loss of mechanical integrity in dissolvable composite frac plugs deployed in low- to moderate-temperature wellbores (~70°F to 200°F) utilizing fresh to moderately saline water systems. It employs a balanced organic-acid matrix combined with a controlled chloride source to promote sustained electrochemical dissolution of magnesium alloys while minimizing the formation of passivating films.

## KEY BENEFITS & FUNCTIONS:

- Optimized Mild-Thermal Activity: Engineered specifically to activate and sustain magnesium alloy degradation within lower temperature bands where conventional dissolvers stagnate.
- Precipitation Suppression: An integrated chelation framework stabilizes dissolved metallic species, actively suppressing secondary magnesium hydroxide re-precipitation.
- Selective Metalloid Focus: Targets the load-bearing metal architecture directly, causing structural collapse and controlled composite fragmentation without attempting to break down inert resins.
- Flexible Treatment Delivery: Suitable for vertical, deviated, and horizontal wellbores; readily available in 55-gallon drums, 275-gallon totes, and bulk supply.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, Colorless |
| Form | Liquid |
| pH (Neat) | < 1 |
| Specific Gravity @ 25°C | 1.068 – 1.104 |
| Density (lb/gal) | 8.913 – 9.213 |
| Solubility in Water | Complete |
| Freeze Point | < –15°F |

## RECOMMENDED APPLICATIONS

Designed as a post-fracture mechanical mill-out alternative or cleanout pill. Can be batch-mixed or injected completely on-the-fly. The typical treat rate is 5–10% by volume of total treatment fluid, adjusted for downhole temperature, water chemistry, and plug metallurgy.

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSolv 2772™

## DISSOLVABLE COMPOSITE PLUG DISSOLUTION SYSTEM

## PRODUCT DESCRIPTION

SmartSolv 2772™ is a high-performance chemical dissolver developed to promote controlled disengagement of dissolvable composite frac plugs under elevated thermal and saline conditions. Optimized for higher-temperature environments and moderate- to high-TDS water systems, it utilizes a refined organic-acid system paired with a moderated chloride source to sustain electrochemical alloy dissolution while preventing localized passivation.

## KEY BENEFITS & FUNCTIONS

- High-Temperature Stability: Provides highly stable dissolution behavior and uniform surface wetting at elevated bottomhole temperatures without excessive gas evolution.
- Brine & Salinity Compatibility: Performs reliably across moderate- to high-salinity water systems, resisting the interference often caused by high-TDS baseline fluids.
- Reduced Passivation Risks: Advanced solvent architecture keeps metal ions mobile in solution, preventing secondary solids and scale formation from fouling downstream paths.
- Single-Phase Formulation: Fully soluble, single-phase liquid system that mixes cleanly and is entirely compatible with common completion, stimulation, and flowback chemistries.

## PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, Colorless |
| Form | Liquid |
| pH (Neat) | < 1 |
| Specific Gravity @ 25°C | 1.07 – 1.106 |
| Density (lb/gal) | 8.929 – 9.229 |
| Solubility in Water | Complete |
| Freeze Point | < –15°F |

## RECOMMENDED APPLICATIONS

Applied directly as a post-fracture cleanout pill or continuous on-the-fly injection during completion operations. Supports non-mechanical plug removal strategies across horizontal and deviated segments. Available in 55-gallon drums, 275-gallon totes, and bulk volumes.

## PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

smartchemical SERVICES

# SmartSolv 2773™

## DISSOLVABLE COMPOSITE PLUG DISSOLUTION & PASSIVATION-BREAKING SYSTEM

### PRODUCT DESCRIPTION

SmartSolv 2773™ is a high-intensity dissolver system formulated to overcome severe passivation-controlled failure modes encountered during the dissolution of slow-reacting plugs. Specifically engineered for aluminum-based or high-alloy metallic components, it employs a strongly acidified reaction environment supported by a targeted chloride source to disrupt protective oxide layers and re-initiate alloy dissolution.

### KEY BENEFITS & FUNCTIONS

- Oxide Film Disruption: Aggressively breaks through tough, passivating aluminum oxide films that halt or severely delay regular chemical dissolution processes.
- High-Alloy Performance: Tailored to handle resilient aluminum-bearing and high-alloy metallics where conventional organic systems fail to establish a reactive footprint.
- Rapid Integrity Loss: Triggers rapid loss of downhole anchoring force and seal decompression, converting metal components into passable, flowback-compatible debris.
- Global Architecture Compatibility: Maintains consistent wetting across metallic, elastomeric, and composite interfaces without compromising downstream system fluids.

### PHYSICAL PROPERTIES

| Parameter Value | Value |
|---|---|
| Appearance | Clear, Colorless |
| Form | Liquid |
| pH (Neat) | < 1 |
| Specific Gravity @ 25°C | 1.083 – 1.119 |
| Density (lb/gal) | 9.038 – 9.338 |
| Solubility in Water | Complete |
| Freeze Point | < –15°F |

### RECOMMENDED APPLICATIONS

Deployed as a specialized post-fracture dissolver pill or cleanout treatment in vertical, deviated, or horizontal wellbores. Typical treatment rate ranges from 5–12% by volume of total treatment fluid. Can be batch mixed or injected continuously as required by the downhole timeframe.

### PACKAGING

Typical packaging is provided in totes or bulk containers. Other dimensions are available upon request.

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# PRODUCT INDEX

*A Complete Cross-Reference of All Product Lines*



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# PRODUCT INDEX

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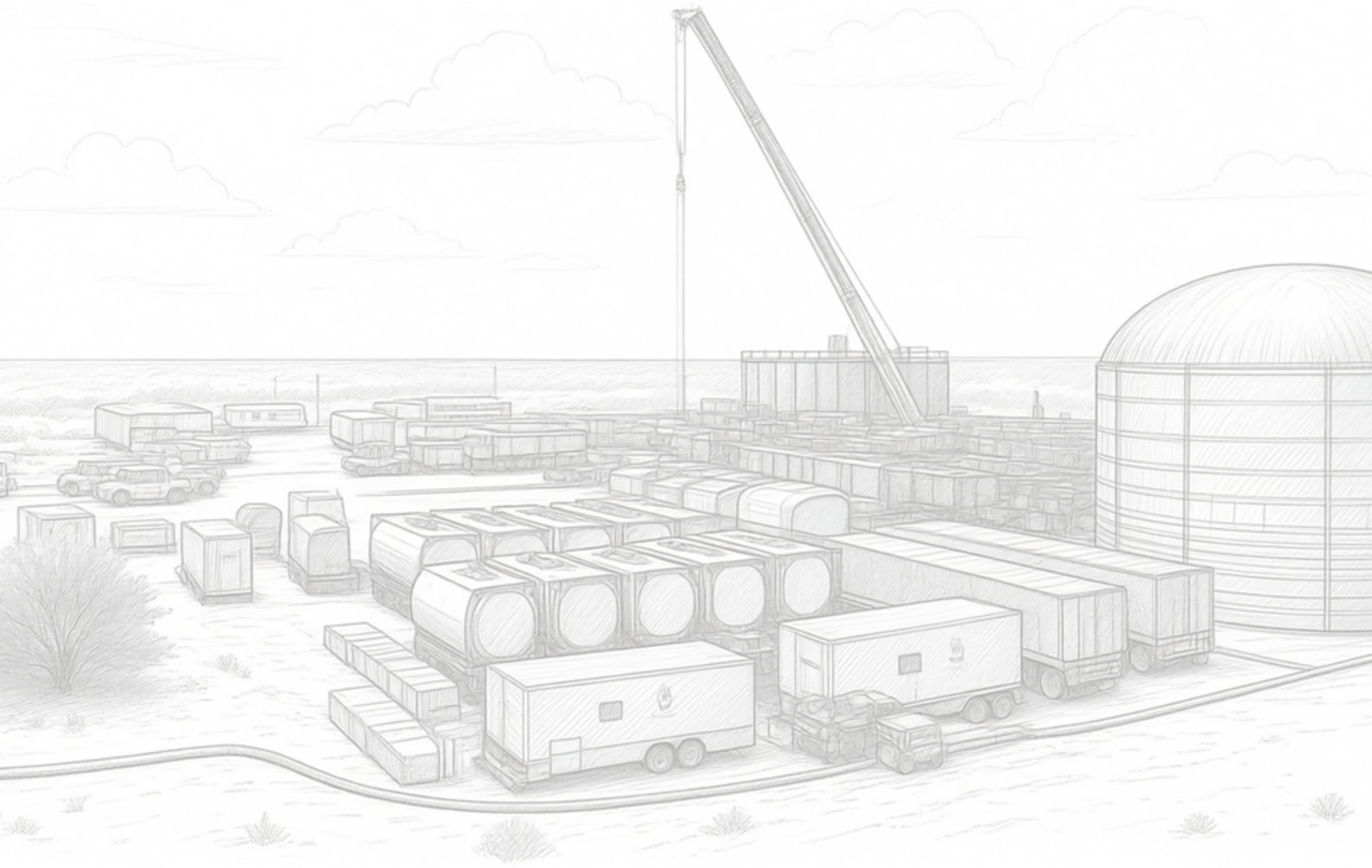

## Innovation in Chemistry, Value in Service.

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