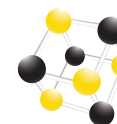


# Chemical Catalog

We create chemistries that improve the efficiency, safety and financial performance of our clients' assets.

**FQE<sup>®</sup> Chemicals**



[fqechemicals.com](http://fqechemicals.com)



DESIGNED AND  
MANUFACTURED  
IN THE USA









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# Why FQE Chemicals?

**We are an environmentally conscience chemical manufacturer that designs process-friendly cleaning and decontamination products. Our products target specific contaminants that reduce personnel exposure risk, unit downtime, and disposal costs.**

Top reasons to choose FQE Chemicals.



**We save you time and money on critical operations**



**We reduce exposing personnel to hazardous conditions**



**Our products are designed to be environmentally conscience**



**We have over 20+ years of cleaning experience**



**DESIGNED AND MANUFACTURED IN THE USA**

## Commitment to Safety and the Environment

At FQE Chemicals, we hold health and safety as a core value and we actively care for our employees.

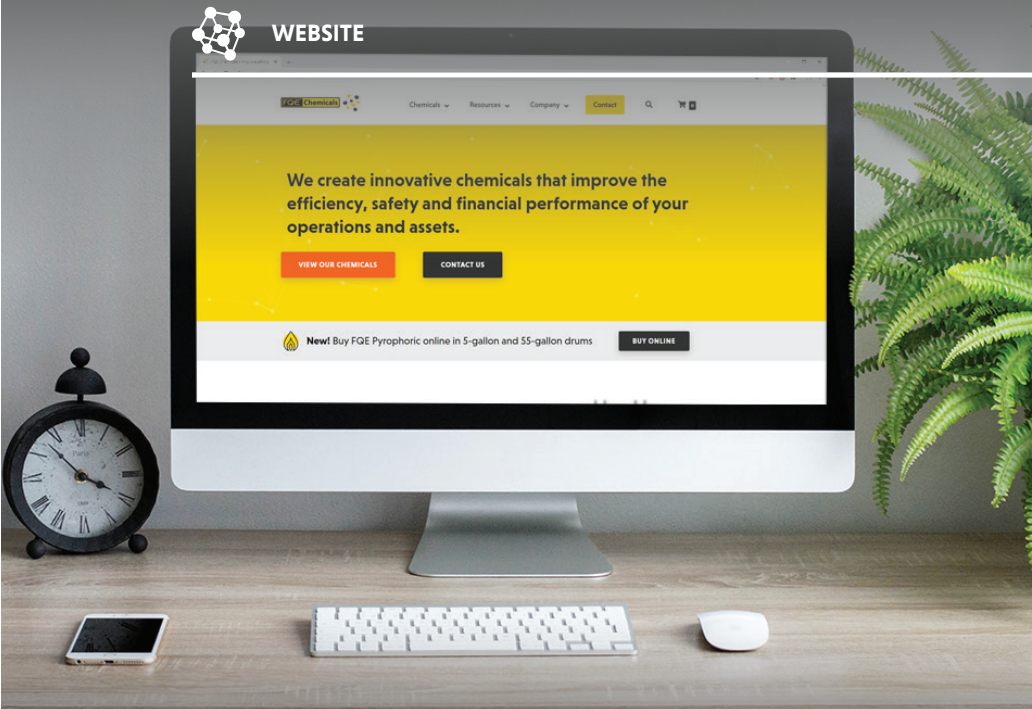
It is the intention of the Company to conduct all phases of its operations in the safest possible fashion. Our goals are:

- To provide our employees with a safe work environment, protecting them to the best of our ability from injury
- To protect the public and our clients against injury or damage to the best of our ability
- To protect our assets, vehicles, buildings, equipment and products against damage or loss
- To protect our environment against spills or contaminations of chemical spills/ releases to the air, ground, water and soil

**FQE Chemicals is a proud member of the following organizations:**







Visit our website to access technical data sheets, white papers and our extensive list of case histories.

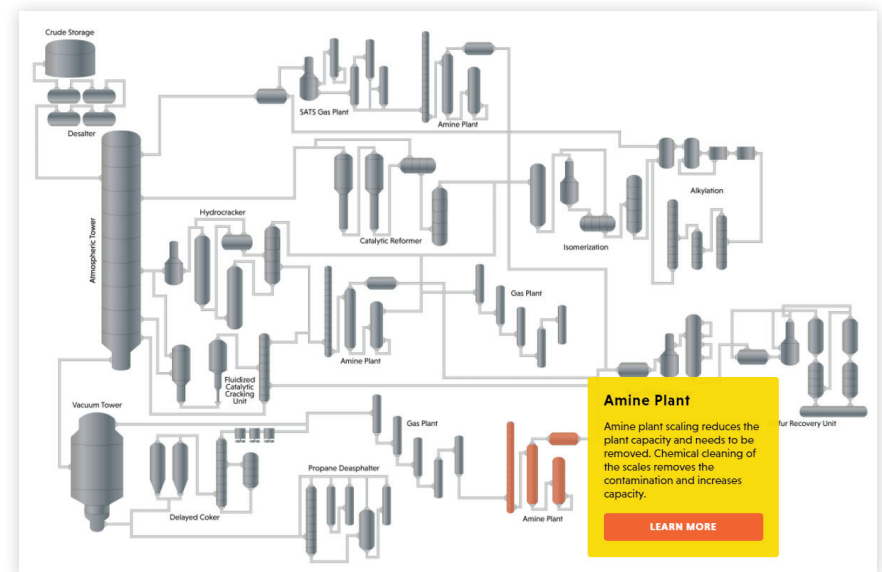
**fqechemicals.com**

## Refinery Debottlenecking

Each unit in a refinery is susceptible to different types of fouling. Our website features fourteen different units, where we explain their process, the problems they cause and our chemical solutions.



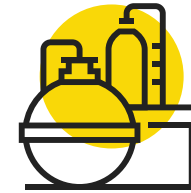
Visit our refinery overview page





# Industries

We have experience with applications in diverse industries including refining, natural gas processing, petrochemicals, waste treatment, mining and more.



## Refinery Debottlenecking

### Industry Description

As refinery business margins continue to decrease, it is important to utilize the most efficient, time-sensitive cleaning methods available.

Most importantly, these methods must maintain a high level of safety considerations. Chemical cleaning fulfills these goals.

### Applicable Chemical Families

- FQE Solvent
- FQE H<sub>2</sub>S Scavenger
- FQE Pyrophoric
- FQE NORM Decontamination
- FQE Degassing
- FQE Scale Control
- FQE Odor Control
- FQE Degreaser





## Natural Gas Processing

Natural gas processing comes with challenges such as the contaminants in equipment causing reduced throughput and compromising product quality.

The processing of natural gas includes removing contaminants like water vapor, hydrogen sulfide and carbon dioxide from incoming gas streams.

- FQE Solvent
- FQE H<sub>2</sub>S Scavenger
- FQE Pyrophoric
- FQE NORM Decontamination
- FQE Degassing
- FQE Scale Control
- FQE Odor Control
- FQE Degreaser



## Mining Decontamination

Mines that are used to access deposits of valuable resources are susceptible to several types of fouling.

In addition to the type of mine, the product being mined can also determine the type of foulants that will appear in equipment.

- FQE Solvent
- FQE H<sub>2</sub>S Scavenger
- FQE Pyrophoric
- FQE NORM Decontamination
- FQE Degassing
- FQE Scale Control



## Waste Treatment

Waste treatment can refer to either municipal or industrial facilities. However, most types of waste treatment encounter many of the same foulants. The equipment used to clean wastewater can vary from sour water treating equipment in oil refining to water hardness scale in Dissolved Flotation (DAF) systems.

- FQE Solvent
- FQE H<sub>2</sub>S Scavenger
- FQE Pyrophoric
- FQE Degassing
- FQE Scale Control
- FQE Odor Control
- FQE Degreaser



## Petrochemicals

Petrochemical processing includes cracking plants for olefin production to linear low-density polyethylene (LLDPE) catalytic process to alcohols and surfactants and a multitude of other processes. One thing they all have in common is that process equipment fouling is a huge problem.

- FQE Solvent
- FQE H<sub>2</sub>S Scavenger
- FQE Pyrophoric
- FQE NORM Decontamination
- FQE Degassing
- FQE Scale Control
- FQE Degreaser

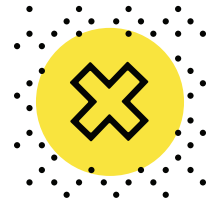






# Applications and Chemicals

Our chemicals can be applied in a variety of applications. The next page will provide information on our most common applications. The icons represent the application and are referenced underneath each chemical family.



## Degassing

### Application Description

The demand for system decontamination which meets or exceeds regulatory safety and environmental requirements is growing. Degassing reduces personnel safety concerns and reduces the release of gas into the environment while returning units to full production in record time.

### Results Using Our Chemicals

- Merges into the shutdown phase – minimizing turnaround time
- Greatly reduces steam-out time
- Limits release of hydrocarbon gas
- Expedites entry into vessels without the use of fresh air
- Reduces mechanical cleaning time
- Wastewater disposal without concern for bio-culture toxicity



## Chemical Decontamination

Eliminate dangerous elements inside your equipment in a way that minimizes both cost and safety risk with our chemical decontamination strategies. Make your equipment safe to enter without risking safety or downtime with chemical decontamination.

- Reduces exposure to safety risks of mechanical cleaning
- Predictable and reliable application with lower risk to project costs
- Faster execution reduces turnaround downtime
- Leaves equipment safe for hot work

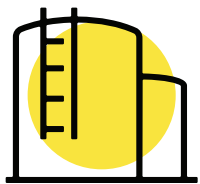


## Heat Exchanger Cleaning

Pulling a heat exchanger for cleaning is frustrating, time-consuming and expensive, but we can help. We custom engineer solutions and processes which clean heat exchangers in place, without the delay, frustration and expense. No pulling equipment out of service for a week. No hydroblasting. No re-fabricating of bundles.

- Generates minimal waste
- Completely recoverable oils for hydrocarbon based foulants
- Less exposure to safety risk
- Lower project costs
- Faster project execution
- Less handling of expensive pieces of equipment
- Improve future heat transfer

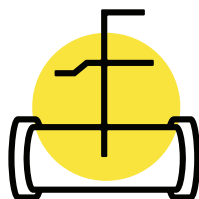




### Tank Cleaning

For many facilities, the conventional tank cleaning practice is expensive and risky. But FQE Chemicals offers a chemical tank cleaning methodology that's changing the industry standard. No crew member enters the tank, no hazardous waste is emitted and up to 98% of your oil is recovered!

- Less exposure to safety risk
- Lower project costs
- Recoverable hydrocarbons
- Less environmental harm
- Expedites execution
- Less manpower requirements



### Online Cleaning

Industrial plant operation comes with a diverse set of challenges that require solutions tailored towards optimizing safety and productivity. We have developed a unique set of chemical products designed to function in fully operating environments to continuously remove static foulants as well as act as an antifoulant.

- Extend critical equipment run time and reduce equipment failure.
- Improve process uptime
- Recover lost potential revenue with throughput recovery
- Optimize productivity
- Safer Operation
- Increase time between turnarounds



### Odor Control

Malodors originating from processes can negatively impact a facility due to safety concerns, public complaints and day-to-day operation inefficiencies. Our odor control products rapidly remove foul nuisance odors found in storage vessels, wastewater and sludge. They are designed to remove a variety of problem odorants.

- Rapidly eliminate odors found in process operations; including refinery, petrochemical, fertilizer, wastewater, etc.
- Increase working productivity
- Increase safety and eliminate personnel exposure concerns
- Eliminate process impact due to public complaints



### Rail Car Cleaning

FQE Chemicals provides an innovative rail car cleaning system that is designed to significantly reduce cleaning durations and waste effluent volumes via a vapor phase injection application. Furthermore, our process does not require manned entry and therefore eliminates manpower exposure to hazardous situations.

- Less exposure to safety risk
- Boosts your financial and business performance
- Lower waste disposal costs
- Recover hydrocarbon content as an unexpected revenue stream



# FQE Degassing and Decontamination

Degassing is a chemical cleaning technique that reduces the hazards of dangerous gaseous elements inside processing equipment. To improve the degassing process, it is often recommended that decontamination (solvent circulation) precede degassing to minimize the source of contamination (e.g., sludge, heavy deposits, etc.).



## FQE® LEL-Vapor

FQE LEL-Vapor will preferentially absorb problematic LEL's from vapor spaces and equipment surfaces.

- Reduces degassing time
- Applicable for all light hydrocarbons such as benzene, gasoline, alkylate, and para-xylene
- Reduces the need for thermal oxidizers and internal combustion engines
- Can be used when venting/flaring is not available or feasible

## FQE® LEL-Surface PATENTED

FQE LEL-Surface offers a perfect balance of cleaning and LEL reduction through a patented formulation of powerful surfactants and solvents.

- Effective in reducing LEL readings in degassing operations
- Lowers LEL readings for faster entry
- Effective in decontaminating tanks after bulk oil removal
- Reduces the need for mechanical cleaning



Learn more about our degassing products





## FQE Solvent

FQE Chemicals dispersants and solvents are designed to target and decontaminate deposits such as asphaltenes, heavy sludges, waxes, paraffins and polymers typically found in heat exchangers, vacuum tower bottoms, coker fractionator bottoms, oil storage tanks, and other hydrocarbon processing equipment.



### **FQE<sup>®</sup> Solvent-H<sup>+</sup>** PATENTED

FQE Solvent-H+ offers unsurpassed performance in dissolving and dispersing solid hydrocarbon deposits.

- Restores the efficiency of process equipment
- Recovers valuable oil product as a reusable good
- Virtually no waste is generated
- Dissolves and disperses heavy sludges, asphaltenes, waxes, and paraffins

### **FQE<sup>®</sup> Solvent-HW**

FQE Solvent-HW is a polymer/wax dispersant and decontaminant.

- Restores the efficiency of process equipment
- Recovers valuable oil product as a reusable good
- Virtually no waste is generated
- Dissolves both aliphatic wax and asphaltene hydrocarbon deposits

### **FQE<sup>®</sup> Solvent-ME**

FQE Solvent-ME is a water-based micro-emulsion cleaner based on award-winning FQE Solvent-H+.

- Saves money by removing the need for cutter stock purchase and/or storage
- Leaves all surfaces water wet for inspection purposes, black light testing approved

### **FQE<sup>®</sup> Solvent-PR<sup>+</sup>**

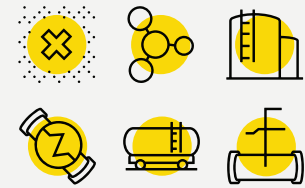
FQE Solvent PR+ is very effective in dissolving hydrocarbon-based solids.

- Reduces outage days compared with traditional mechanical cleaning methods
- Dissolves hydrocarbon-based solids such as asphaltenes, resin, and various polymers
- Non-corrosive to stainless steel and soft metals



## FQE Pyrophoric Control

Provides a safe and effective method of neutralizing dangerous iron sulfide deposits on processing equipment to eliminate the hazardous fire risk.



### FQE® Pyrophoric

FQE Pyrophoric is a non-toxic, non-hazardous formulation designed for application in any operation where pyrophoric iron presents a hazard.

Compared to potassium permanganate:

- 50% more cost effective
- 50% reduction in downtime; mitigation is twice as fast
- No residual manganese byproduct
- No adverse effects on waste water treatment

### FQE® Pyrophoric-W

Winterized version of FQE Pyrophoric.

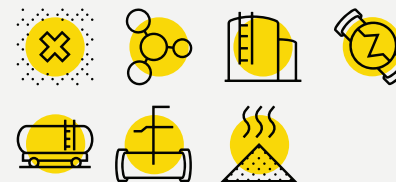


Learn more about our pyrophoric products



# FQE H<sub>2</sub>S Scavenger

Our line of H<sub>2</sub>S Scavengers provide non-reversible elimination of harmful hydrogen sulfide gases in process equipment.



## FQE<sup>®</sup> H<sub>2</sub>S Scavenger

FQE H<sub>2</sub>S Scavenger is a highly efficient H<sub>2</sub>S scavenger that reacts instantaneously and provides permanent elimination of H<sub>2</sub>S. This product works in both liquid and steam phases.

- Fast reaction time eliminates requirement for ancillary mixers and storage tanks – maintain a small footprint
- Very cost effective compared to traditional chemical agents like permanganate and glyxol
- Reduces the need for thermal oxidizers (TO) and internal combustion engines (ICE)
- Delivered as a liquid so no additional mixing or blending is required
- Can be applied with other FQE cleaning/degassing products so one cleaning stage can be used for multiple contaminants

## FQE<sup>®</sup> H<sub>2</sub>S Scavenger Z

FQE H<sub>2</sub>S Scavenger Z is a non-triazine solution for treating H<sub>2</sub>S entrained in water.

- Reduce chemical use by 50-75% compared to MEA triazine
- Instantaneous and irreversible H<sub>2</sub>S sequestration
- The reaction will occur no matter the total dissolved solids in the system



Learn more about our H<sub>2</sub>S products



## FQE NORM Decontamination

NORM decontamination products remove Naturally Occurring Radioactive Material from contaminated equipment, reducing the cost of waste, and providing a much safer alternative to traditional cleaning methods.



### **FQE<sup>®</sup> NORM-Clear<sup>™</sup>** PATENTED

FQE NORM-Clear is a patented, water soluble product developed with selective extractants designed to completely remove NORM.

- Saves time and reaches areas not accessible by traditional hydroblasting methods
- Reduces the volume of dangerous waste and the large expense of highly specialized disposal
- Removes NORM radioactively from metal surfaces to allow the reuse or sale of previously contaminated material and process equipment
- Less exposure to safety and environmental risks

### **FQE<sup>®</sup> NORM-Scale**

FQE NORM-Scale is used to remove surface scale in NORM remediation and can be followed in this application by FQE NORM-Clear as a non-destructive method to remove any radioactive material that is embedded in the metal pores.

### **FQE<sup>®</sup> NORM-Precip**

FQE NORM-Precip is intended to be used in conjunction with and following the application of FQE NORM-Clear to obtain radioactive free wastewater for reduced hazardous disposal.

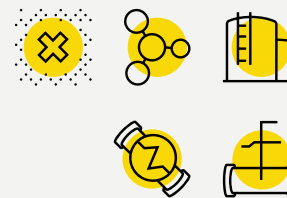


Learn more about our NORM products



## FQE Scale Control

Scale control chemicals are effective at dissolving difficult scale deposits that collect on common refinery and utility equipment that cause reduced production and system flow.



### **FQE® Barium-Clear** PATENT PENDING

FQE Barium-Clear controls scale in operating systems where traditional acid treatments are not effective.

- Increases oil and gas, and petrochemical production by removing mineral scale that is restricting flow
- Non-acidic formula is personnel and equipment safe
- Anti-redeposition formula to maintain a homogeneous fluid and prevent rescaling
- Non-corrosive on most steel

### **FQE® Scale-Solv SS**

FQE Scale-Solv SS is an engineered cleaning compound for removal of scale deposits and is especially effective for the removal of iron oxides and water salt deposits such as calcium carbonate.

- Safe for use on stainless steel metallurgy
- Very cost-effective compared to other chloride-free alternatives
- Effective on a wide range of scale deposits



Learn more about our scale products



# FQE Odor Control



Chemistry designed to remove, neutralize and deodorize malodors occurring in equipment.

## **FQE<sup>®</sup> Ammonia Odor**

FQE Ammonia Odor is effective in the removal, neutralizing, and deodorizing of ammoniacal odors from processing and storage vessels typically found in refinery operations.

## **FQE<sup>®</sup> General Odor**

FQE General Odor is a specially formulated mixture of environmentally safe compounds designed for odor control associated with refuse, waste treatment, paper processing, rendering and other industrial processes.

## **FQE<sup>®</sup> Mercaptan Odor**

FQE Mercaptan Odor eliminates mercaptans and disulfides in crude oils and in refinery operations through a unique chemical reaction process.

- Odors are permanently removed through source elimination
- Easily manage operations to threshold specifications for mercaptans and disulfides
- Efficient and cost-effective treatment

# FQE Degreaser

Degreaser products target foulants and provide efficient cleaning of oils and greases while ensuring safe working environments.



## FQE® Pore Clean

FQE Pore Clean is an environmentally safe, aqueous mixture developed as a final polishing step during a change of service. It will remove hydrocarbon from the pores of metal or substrate and will keep it dispersed in water for several hours before any phase separation occurs.

## FQE® Citrus Degreaser

FQE Degreaser Citrus is an environmentally friendly concentrated liquid solvent cleaner containing naturally occurring orange terpene solvents together with a blend of selected anionic and nonionic emulsifiers and penetrating agents. It is an exceptional choice for effective and safe work on difficult hydrocarbon fouling.

## FQE® Oil Degreaser

FQE Oil Degreaser is an alkaline water-based degreaser for efficient cleaning of heavy oils and greases typically found in petroleum refineries. With its high pH this chemical is a moderate emulsifier that will phase separate removed oils when the cleaning liquid is static. A special blend of inorganic builders is incorporated for water softening, detergency and all-around superior performance.

## FQE® Fin-Fan Degreaser

FQE Fin-Fan Degreaser is excellent in removing light to medium oil contaminants typically found in refinery and petrochemical plant air coolers (Fin-Fans). It is safe for application to soft metal surfaces such as aluminum and brass. Excellent surface adhesion for prolonged contact and superior degreasing activity.

## FQE® Wax Degreaser

FQE Wax Degreaser is a liquid cleaning formulation containing a blend of penetrating and emulsifying agents. These, coupled with a special blend of inorganic "builders", give a product with all-around superior performance and economy for removal of waxes and hydrocarbon deposits.





Contaminated Piping -  
Before Treatment



## Related Content

The following pages feature examples of the content you can find on our website. From case histories, white papers to videos that demonstrate our chemicals abilities.

Contaminated Piping -  
After Treatment

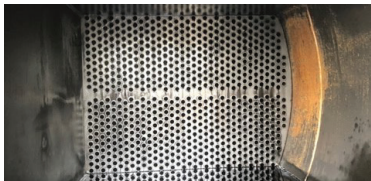


## CASE HISTORY

# US refinery uses FQE<sup>®</sup> Solvent-H+ to improve safety while reducing outage time and eliminating mechanical cleaning costs

**A refinery located in the Midwestern area of the United States was looking to improve upon the efficiency and safety of their crude unit exchanger cleaning program.**

**FQE<sup>®</sup> Solvent-H<sup>+</sup>**  
PATENTED



## Results Achieved

**Over 50% Reduction in  
Outage Time**

**Eliminated Mechanical  
Cleaning Costs**

**Reduced Hydroblasting  
Mitigates Personnel Risk**

## Summary of Case History

The refinery typically ran a Heavy Canadian Crude and saw consistent issues associated with heavy organics and asphaltenes. Prior to the vapor phase application, the refinery had utilized hydroblasting as their sole and preferred method to clean exchangers.

Due to consistent heavy fouling, these exchangers would typically take between 12 – 15 ten-hour shifts to complete. Furthermore, hydroblasting posed numerous safety challenges associated with handling high-pressure water. These shortfalls led the refinery to investigate pre-treatment options to reduce the hydroblasting duration and costs.

As a test comparison, the refinery elected to compare the parallel set of exchangers; one with no pre-treatment prior to hydroblasting and the other treated with the patent pending FQE Solvent-H+ product. The Solvent-H+ treated bundle was vapor phase cleaned over a 4 – 6 hour period.

Following the cleaning process, the refinery compared the two parallel sets and found that their hydroblasting man-hours were reduced by over 50%, which made this a significantly safer process. Furthermore, the decreased time led to over 50% in mechanical cleaning cost savings.



View all our case histories





WHITE PAPERS



# Online/In-Service Exchanger Cleaning

**New shock treatment application for heavy hydrocarbon fouled exchangers.**

Download the white paper



# NORM Decontamination

**New exclusive chemical application options for the mitigation of radioactive scale in the oil and gas industry.**

Download the white paper





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