chemical cleaning and decontamination solutions for the refining industry
efficient decontamination

reduce energy consumption, emissions and waste

Energy savings are fundamental to maintaining or improving refinery profitability. SUEZ has developed an advanced chemical cleaning and monitoring program that enables efficient decontamination of refinery equipment. This program can help refineries achieve H₂S, aromatics, and LEL targets in various process units in preparation of unit maintenance.

Key benefits of effective and efficient decontamination include:

• Reduction of:
  — Maintenance costs and down time
  — Steam consumption and out time
  — Mechanical cleaning time
  — Waste generation and discharge cost
  — Pre-maintenance work by up to 50%
• Faster attainment of “gas-free” equipment
• Avoidance of odor problems when opening the column
• The ability to easily process produced condensate in the wastewater plant

SUEZ’s program removes pyrophoric products and provides effective degreasing and degassing of refinery equipment. The appropriate type of cleaning depends on the unit configuration, fouling mechanism investigation, and deposit analysis.

Preparation, monitoring and safe execution are key in an effective decontamination program. SUEZ’s expertise helps refineries realize significant energy and time savings, safely.

Types of chemical cleaning

two types of chemical cleaning are typically applied in the refining and petrochemical industry.

On-line chemical cleaning

Performed while the unit is still in operation, on-line chemical cleaning changes the operational parameters during cleaning activities to:

• Increase the thermal efficiency of specific equipment or of the overall unit
• Reduce hydraulic limitations in columns, pipe lines, heat exchangers, etc.
• Avoid premature or unscheduled shutdown
• Achieve energy savings

On-line chemical cleaning is appropriate for:

amine units, hydrotreating unit reactors, crude unit OVs, FCC slurry exchangers, and others.

Careful evaluation is needed during this type of cleaning to prevent the re-deposition of fouling/deposit material further downstream. This could cause a more critical fouling situation of the unit than was previously experienced.

Off-line chemical cleaning

This type of cleaning is performed during a planned unit shutdown. Key objectives of off-line chemical cleaning include:

• Obtention of gas-free equipment (to allow access for inspection and maintenance)
• Reduction of steam-out time, shutdown time, maintenance costs, and time required to perform the mechanical cleaning

There are two types of off-line chemical cleaning: the steam phase (decontamination) and the liquid phase.

The steam phase (decontamination) is a “chemical cleaning” that reduces the steam-out time needed prior to entering the equipment during a turnaround.

Steam cleanings are appropriate for:

fractionation columns in CDU, vacuum units, FCCU, visbreakers, HDS, LC finer, lube units, amine units, heat exchangers, separators, drums, etc. Steam “chemical cleaning” offers significant benefits in equipment where a steam-out procedure is typically applied during the shutdown. These benefits include reduced cleaning time and cleaner assets than achieved with high-quality steam.

The liquid phase chemical cleaning is performed when steam cleaning alone is not sufficient to remove fouling or deposits. Depending on the type of contamination and the objective of the cleaning, the liquid phase could contain one or more of the following:

• Degreasing: removes organic substances with medium and high molecular weight and muds. This is applied as the first step in the chemical cleaning process. The degreasing step is commonly used in CDU, vacuum units, visbreakers, FCC slurry, storage tanks, etc. In general, degreasing is applied in hydrocarbon processing units where the precipitation of asphaltenes, waxes, and coke particles may have caused fouling during the operation.
• Degassing: removes light hydrocarbons such as benzene, toluene, xylene, light gasoline, etc., from the equipment. The degassing step is also used for the removal of hydrogen sulphide and inorganic volatile salts (i.e., ammonium salts). The objective of this phase is to obtain the equipment gas-free to allow equipment entering.
• Acid cleaning: removes strong inorganic deposits such as carbonates and sulphates of calcium and magnesium, as well as for the total removal of iron sulphide deposits. This cleaning step should be applied in units or equipment where maintenance activities will be conducted requiring flame cutting, welding, etc.
Taking the Guesswork out of Refining

By its very nature, hydrocarbon processing can present significant operating and business challenges. SUEZ provides superior technologies and services to the hydrocarbon process and petrochemical industries that can reduce overall operating and product costs while optimizing plant performance and reliability. As the leading provider of water and process treatment solutions to the global refining industry, we have the experience to offer you individualized treatment programs that:

- Improve refinery throughput
- Protect valuable capital assets
- Increase profit and yield
- Reduce energy use
- Meet specifications for finished fuels
- Comply with environmental health and safety regulations

In keeping with SUEZ’s customer-focused business practices, our dedicated specialists work with you to assist in meeting economic, quality, safety and environmental performance objectives. Through our unrivaled combination of innovation, technical on-site support, and field engineering, we can work with you to get the most from every step in the refining process.

Partnering with SUEZ

For decades, SUEZ has been a strategic partner to hydrocarbon processing companies around the world, delivering complete water and process tools and technologies that help meet the industry’s greatest business challenges. Today, we are just as committed to developing proven solutions that will help you meet your business objectives now and in the future. From growing environmental regulations to future trends, our experience and ability to anticipate industry changes gives us the ability to meet the unique needs of oil refineries and petrochemical plants with customized treatment programs that help you stay on top.

Find a contact near you by visiting www.suezwatertech.com and clicking on "Contact Us."

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