

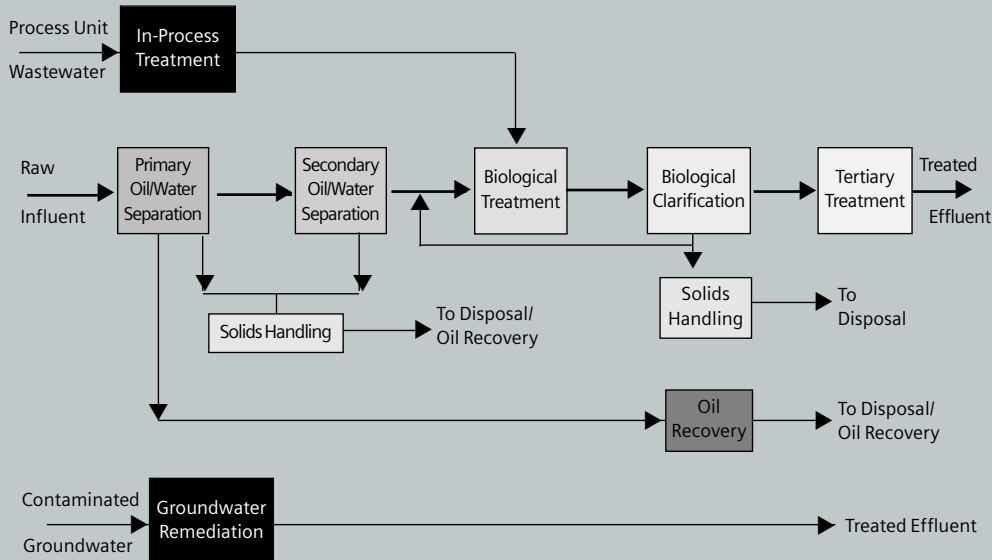


Total Wastewater Management for the Petroleum Refining and Petrochemical Industries

Water Technologies

SIEMENS

Petroleum Refining/Petrochemical Wastewater Treatment



In 1937, we supplied the first API oil/water separator at a petroleum refinery on the U.S. east coast.

Our Solutions are Proven

A partnership with Siemens Water Technologies gains a host of benefits for you:

- We provide more than 100 different products and processes for dealing with wastewater – and will customize a solution specifically for your facilities.
- We deliver the full spectrum of services – from initial design, engineering and pilot/laboratory studies for water, wastewater and recycling/reuse issues.
- We assume the risks and responsibility for the complete design of your wastewater system – freeing you to concentrate on enhancing the profitability of your core business.
- We are experts at process optimization of downstream facilities – resulting in operational improvements and significant cost savings – now and in the future.

- We can help you monetize your water-related assets – directly reducing operating costs and raising your profit margins.
- We guarantee performance and costs, as well as regulatory compliance, within the design parameters of your operation.

Whether it's oil/water separation, biological treatment, recycle/reuse, solids handling, VOC emissions control, groundwater remediation, or in-process treatment, Siemens Water Technologies delivers complete and economical solutions for the petroleum industry.

These solutions are backed by the wastewater treatment industry's most comprehensive range of services, including laboratory and pilot studies; wastewater equipment design and supply, mobile/temporary wastewater treatment services and wastewater treatment process evaluations.



Siemens Water Technologies is uniquely equipped to handle all of the requirements that petroleum refining and petrochemical companies insist on from a wastewater treatment partner. We provide total responsiveness to concerns of safety, toxicity and hazardous materials control and VOC containment, and we offer prompt, expert, worldwide service.



Siemens Water Technologies has provided hundreds of API oil/water separators to petroleum facilities around the world for over 70 years.



Oil roll skimmers recover up to 99 percent pure oil from API and CPI separators.

Oil/Water Separation Equipment

Primary Oil/Water Separation

For more than 70 years, Siemens Water Technologies has been providing cost-effective screening and primary oil/water separation equipment to the petroleum refining industry, while continuing to improve and upgrade designs to provide high levels of performance and meet all current regulations. Our technologies include the API oil water separator, corrugated plate interceptors, hydrocyclones, the oil roll skimmer, and other types of skimming equipment.

Our API separator design has been risk-assessed, assuring safe operation. Above ground, steel tankage provides double-containment and visual leak detection for hazardous sludges and wastewater. VOCs are contained through the use of vapor-tight fiberglass covers. Additional safety features include non-metallic collector components and covers, stainless steel on all wearing metallic components, deflagration vents, flame arrestors, and more.

Sludge collection hoppers, screw conveyors, flushing connections, clean-outs, sludge withdrawal piping, and sludge pumps are designed to remove and transfer API separator bottoms with a minimum of maintenance and operator attention. This is important because the inability to remove thick, sticky sludges is the main reason collector components fail in petroleum applications.

Our corrugated plate interceptor separator is a cost effective alternative to the API separator design for applications with low influent solids concentrations.

Our oil skimming equipment ensures efficient and safe removal of collected oils, even when visual observation is not possible. The operation is continuous, is independent of oil depth in the API separator, and requires no operator attention or adjustment.



DGF separators can be completely shop fabricated with VOC containment covers. Ancillary sludge handling, activated carbon and recirculation equipment can also be provided.



Specially designed, high-strength, light-weight, non-metallic collector components are designed to work in the high temperature and corrosive environments of the petroleum industry.

Secondary Oil/Water Separation

Since the 1950s, our flotation separation equipment has been noted for superior removal of free and emulsified oils and suspended solids. Today, our dissolved air flotation (DAF) and dissolved gas flotation (DGF) oil/water separators are a complete solution to the complex environmental equipment issues facing the petroleum industry.

DAF/DGF separators may be designed either as rectangular or circular units, incorporating steel or concrete tankage. The steel tank designs allow all piping and tankage to be located above grade for double containment of hazardous wastewaters and sludges, in addition to providing visual leak detection for all separator components, including tankage. Options include rapid mix and flocculation zones, chemical pretreatment, float holding tank and steel bottom elevated units.

Our rectangular DAF/DGF separators can achieve float concentrations in excess of 20 percent oil and solids.

This concentrated float can eliminate the need for additional thickening equipment normally associated with other types of flotation technology. Efficient design allows both flash mixing and flocculation to be integrated into the unit without the addition of separate tankage. Steel tank, shop fabricated units are available in capacities of up to 4,000 gallons per minute (908.5 cubic meters per hour), significantly reducing installation and construction time and costs.

DGF separators can be provided with air-tight fiberglass covers for VOC containment. In these applications, state-of-the-art non-metallic and stainless steel collector components are designed to operate for years in the corrosive environment of enclosed DGF separators. Nitrogen is normally used as the flotation gas for safety when covers are required for VOC control.



The Auto-Shell™ filter is well suited for those applications where biological wastewater treatment is not available and effluent free oil concentrations of 5 mg/l or less are required.



Siemens Water Technologies offers induced air flotation (IAF) and induced gas flotation (IGF) separators suited for those applications with limited space for equipment.

The innovative Folded Flow® DGF separator incorporates patented hydraulic designs in the flotation tank that allow for hydraulic loading rates up to 10 gallons per minute per square foot (24.4 meters per hour), and higher. This is compared to conventional units which operate at loading rates of 3 gallons per minute per square foot (7.3 meters per hour) or less. This unique Folded Flow® separator design results in significant cost and space savings compared to conventional DAF/DGF separator designs, while still offering superior oil and suspended solids separation.

Safety is always the most important consideration in the DAF/DGF separator designs. When potentially explosive vapors accumulate under a VOC containment cover, the recirculation/pressurization system can use inert gases such as nitrogen instead of air to reduce explosion risks.

Hydrocell® and Quadricell® induced air flotation (IAF) and induced gas flotation (IGF) separators are well-suited for the stable, large volume waste streams generated by oil field and oil platform applications. These separators have few moving parts and comparatively small footprint units

feature a gas-tight design for VOC and/or odor control. The Auto-Shell™ deep bed, walnut shell media filter is suited for those applications when nearly all free oil must be removed from a waste stream. The system offers longer on-line time before oil breakthrough, and has zero upstream flow interruption, preventing feed pump dead heading.



Cost effective circular DAF/DGF units are available in numerous standard and custom configurations.

Combined biological processes:

- AGAR® IFAS suspended growth systems
- Surfact™ systems
- Rotating biological contactors (RBC) solids contact systems
- Trickling filter solids contact systems
- PACT® powdered activated carbon systems

Fixed film biological processes:

- AGAR® suspended growth systems
- Trickling filters
- Rotating biological contactors RBC systems

Suspended growth biological processes:

- Mechanical aeration
- Petro™ membrane bioreactor (MBR) systems
- Coarse bubble aeration
- DualAir® and Rex-Flex® fine bubble aeration systems
- Bionutre™ nutrient removal systems
- VARI-CANT® jet aeration systems
- OMNIFLO® sequencing batch reactors
- Orbal® aeration systems
- Sim-Pre® aeration systems
- VLR® vertical loop reactor systems
- VertiCel® systems

Anaerobic Treatment

- Paques anaerobic treatment systems



The modular design of the RBC system allows units and tankage to be completely shop fabricated.



Our package plants for biological treatment can economically handle clarification, aeration and digestion in a single modular unit.

Biological Treatment

The Right Process

There is a "right" biological treatment process for your application, and Siemens Water Technologies offers it. We have more biological treatment processes than anyone in the business; consequently, our process engineers have the knowledge it takes to select the best biological treatment system for your application.

We evaluate each application for VOC stripping potential, ease of covering for VOC containment, ability to nitrify and possibly denitrify, flexibility to treat shock loads of organic compounds, area requirements, capital costs, operating costs, discharge requirements, and more.

Jet aeration offers high oxygen transfer efficiencies and excellent mixing characteristics in all types of wastewaters. The strong mixing action of the VARI-CANT® jet aeration system is independent of airflow rates, consequently, oxygen transfer rates can be easily matched to varying process conditions.

The rotating biological contactor (RBC) is a major refinement of conventional trickling filter fixed film technology. Where shock loads of organic compounds or toxics have been found to have serious negative impact on activated sludge systems, the RBC® process has been found to be much more resilient and in most cases shows no impact from the shock loads in side-by-side pilot studies.



PACT® systems are particularly well suited for those downstream petroleum applications where low effluent COD levels are required or wastewater reuse is desired.

Our Orbal® aeration system has been proven for performance and flexibility in total ammonia and nitrogen control in numerous petroleum applications.

PACT® systems help refineries meet bioassay requirements. To treat complex wastewaters, groundwater and contaminated runoff in one step, the system adds powdered activated carbon to an aerobic or anaerobic biological process. The carbon then buffers the biological system against toxic organics in the wastewater. When coupled with our Zimpro® wet air regeneration system, sludge is eliminated and the carbon is regenerated for reuse.

The Orbal® aeration system, using completely mixed reactors in series, provides economy, flexibility and reliable treatment performance, while minimizing total cost by employing multi-wall construction. The use of three channels, operating in series, allows dissolved oxygen levels to be varied from channel to channel. This arrangement ensures nitrification of nearly all ammonia in the wastewater. Also, by recirculating effluent from the third channel to the first, and running the first channel at a zero dissolved oxygen condition, total nitrogen removal can be

achieved at a lower power cost than conventional operation for nitrification only.

The VLR® system is a modification of the Orbal system design, allowing this technology to be used at locations with limited room for wastewater treatment equipment, or with those biological treatment systems which may need to be covered for VOC containment.

Our OMNIFLO® sequencing batch reactor (SBR), is a fill-and-draw, non-steady state activated sludge process, in which one or more reactor basins are filled with wastewater during a discrete time period, and then operated in a batch treatment mode. The SBR accomplishes equalization, aeration and clarification in a timed sequence, in a single reactor basin. The OMNIFLO system can handle influent flows ranging from zero to four times design, and a wide range of organic loads and industrial pollutants.



Siemens Water Technologies clarifiers are available in a number of highly efficient and low cost designs, including conventional scraper clarifiers, Tow-Bro® suction clarifiers and Rim-Flo® peripheral feed clarifiers.



The unitube Tow-Bro® clarifier header, installed at dozens of petroleum refineries and petrochemical plants, ensure uniform and rapid removal of biological solids.

Biological Clarification

Innovative Design

Our experience in clarification is unequalled, starting with the development of the scraper clarifier over 90 years ago. But we did not stop there. With a continuing emphasis on innovative designs, we developed the Tow-Bro® suction clarifier header more than 70 years ago – it continues to be the choice for dozens of petroleum facilities.

The Tow-Bro® clarifier sludge removal header, when combined with the peripheral feed Rim-Flo® clarifier design, meets the toughest environmental requirements and offers unequalled process flexibility.

The Rim-Flo® clarifier design is a hydraulically efficient clarification process that allows smaller, more

economical units to be installed. Side-by-side studies have shown the peripheral feed-peripheral effluent Rim-Flo® design to be 50 to 89 percent more efficient than conventional center feed designs. Since all piping is above grade for visual leak detection, the Rim-Flo clarifier eliminates costly below grade trenching and double containment of piping.

The Tow-Bro® clarifier header uses gentle suction action to achieve the highest sludge withdrawal concentration of any biological clarifier sludge device, greatly reducing sludge pumping costs. Its hydraulic design permits rapid and uniform sludge withdrawal throughout the entire area of the clarifier over a 6 to 1 flow range, and it has flat clarifier floors, which reduces excavation costs.



Petro™ MBR systems eliminate the need for, and space requirements associated with, conventional biological clarifiers.



The Gravisand® traveling bridge filter is suited for suspended solids removal and/or turbidity reduction in process water and wastewater.



Hydro-Clear® sand filters have proven effective in meeting the stringent discharge requirements of the petroleum industry.

Tertiary Treatment Effluent Polishing/Recycle-Reuse

Meeting Strict Effluent Requirements

In today's regulatory environment, tertiary treatment may be required to meet strict effluent limits or to allow for recycle and reuse of the treated effluent for cooling tower make-up, boiler feed water, or other processes. For removal of suspended solids, oil and grease, or COD to extremely low concentrations, we offer a number of treatment processes for in-plant, source stream recycle, effluent recycle, and water reclamation for zero liquid discharge.

The Hydro-Clear® shallow bed sand filter easily handles the solids and oils which can be found in effluents. In operation, the filter periodically pulses the bed, clearing it of entrained oil and solids particles, and prolonging filter runs before backwash is required. The pulsing feature allows the filter to

produce a consistent effluent despite significant fluctuations in influent solids concentration, making it well suited for use in systems which reuse treated wastewater for cooling tower make-up.

Siemens Water Technologies offers a number of different activated carbon treatment systems for the treatment of difficult to degrade organic compounds which may be negatively affecting effluent toxicity or COD values. The PACT® system, for example, combines biological treatment and carbon adsorption into a single step. We can also supply granular carbon adsorption systems and services and have comprehensive laboratory services including computer modeling; treatability studies and technical support; licensed hazardous waste transportation and field services; and

a fully licensed and permitted carbon reactivation facility.

For those facilities that have very strict discharge requirements, or wish to reduce water costs through recycle and reuse of wastewater, our Petro™ Membrane Bioreactor (MBR) can be an excellent choice. Our MBR systems can provide effluent TSS and BOD₅ concentrations less than 1 ppm and 5 ppm respectively, making the wastewater suitable for many reuse applications in petroleum facilities.

We provide tubular micro- and ultra-filtration systems for removal of virtually all suspended solids and residual oil and grease. These systems can also be used as pretreatment to reverse osmosis (RO) systems when treated wastewater or high turbidity surface water is used for boiler feed.



Our trailer mounted filter presses are used in a variety of petroleum dewatering applications, including API separator sludges, cooling tower sludges, retention ponds and pits for reclamation, slop oils and production tank bottoms.

Residual Solids/Sludge Handling/Dewatering

Our sludge dewatering equipment is built to provide operating and process flexibility. Each design has numerous custom features to ensure optimum dewatering performance, even in the toughest applications. Our experience ranges from dewatering oily API separator bottoms and DAF/DGF separator float to dewatering biological solids, all in petroleum industry applications.

Belt filter presses include a specially designed low-pressure steam header, which periodically cleans accumulated oils from the filter belts when dewatering API separator bottoms and/or DAF/DGF float. This design reduces the need to manually clean the belts and extends operating cycles, contributing to economical dewatering.

Plate and frame and diaphragm filter presses are suited for higher volume operations where cake dryness is important. Special designs, with features such as integral roll bars and sluice pan; and manual hydraulic back-up closing systems, are used specifically on offshore drilling platforms for filtering completion fluids, drilling muds and fuel oils.

Solid bowl decanter centrifuges are offered in conventional two-phase designs and also three-phase designs, which separate solids, water and oil. This allows valuable oil to be recovered and recycled in oily sludge dewatering applications. Our enclosed centrifuge design also minimizes odor and VOC emissions while dampening noise levels. The extremely small footprint and

minimal exposure to moving parts also makes this type of dewatering very attractive in many applications.

Wet air regeneration systems, when used in conjunction with PACT® systems, will destroy sludge and regenerate spent carbon for use again.

Siemens Water Technologies also operates fully permitted RCRA Part B facilities for advanced processing and disposal of inorganic and trace organic wastes and wastewaters, and recovery of usable resources. We also manage and recycle oil-water mixtures, fuel-water mixtures and other materials. These services, in some instances, allow producers or users to minimize their liability.



Siemens Water Technologies provides a large variety of filtration systems for the treatment of groundwater including media filters, walnut shell filters and activated carbon filters.



Our liquid and vapor phase activated carbon absorbers remove organic contaminants from groundwater, wastewater and air streams.

Groundwater Remediation

You Have Questions, We Have Answers

Treatment of hydrocarbon-contaminated groundwater can be a challenge. What's the best way to handle very dilute free oil? How are MTBE and other organic compounds best removed? How can the high volumes and low organic concentrations in groundwater encountered at remediation sites be economically handled? How can this groundwater be economically reused in refinery operations? We have the specialized solutions the petroleum industry needs for remediation issues.

Where significant complex contamination exists (greater than 200 ppm COD) the PACT® system cleans up groundwater and surface runoff waters.

For free oil removal in petroleum contaminated groundwater, the Auto-Shell™ deep bed filter has the highest efficiency rate in the industry, with 99.23 percent throughput of clean water and effluent oil concentrations in the low parts per million. Hard, black walnut shell media will not stratify in the filter beds, leading to longer on-line time before backwashing is necessary. Simple operation and low maintenance make the Auto-Shell™ filter the choice of many petroleum companies.

Siemens Water Technologies offers a family of activated carbons to remove residual organics from groundwater. The carbons are produced from high quality coals and coconut shells, and are manufactured by steam activation of their carbonized raw materials at

high temperatures in a controlled atmosphere.

Siemens Water Technology can provide activated carbon systems as equipment only, or can provide full service systems where we take complete responsibility for not only supply of the activated carbon adsorbers, but can provide complete activated carbon services which can include monitoring the performance of the activated carbon systems, replacement of exhausted adsorbers and regeneration of the spent activated carbon at our licensed regeneration facilities.

Activated carbon services can be provided at almost any type of facility from oil production operations to petroleum refineries to tank farms and filling stations.



The Zimpro® wet oxidation system is commonly used for treatment of high strength spent caustic generated in petroleum refineries and ethylene plants.



The DGF separator process combines chemical pretreatment and flotation to effectively treat and remove free and emulsified oil from desalter brine water.

In-Process Treatment

Treatment at the Source

Siemens Water Technologies solutions aren't limited to "end-of-pipe" treatment. Often, it's more economical to isolate a waste stream and treat it before it reaches the centralized waste treatment facility. And often, these "treatment-at-the-source" solutions have a major impact on the overall efficiency, treatment costs and regulatory compliance of a treatment facility.

A major source of oil and solids to a combined sewer system is the crude unit desalter water. As more petroleum refineries process a greater variety of crude oils, these same refineries are encountering significant emulsions and large excursions of oil and suspended solids in the desalter brine water. Our DGF separators combine both chemical treatment, to break oil emulsions and

flocculate fine oil and solids particles, with flotation separation to remove these oil and solids particles. This eliminates potential problems with oil emulsions entering and overloading central wastewater treatment plants, allowing existing treatment equipment to operate with greater effectiveness.

Another important impact on a wastewater plant is high strength, high COD wastewaters such as spent caustic. Our Zimpro® wet air oxidation system is used for pretreatment of these high strength waste streams in the petrochemical and refining industries. It is the leading technology for ethylene spent caustic streams and is finding increasing application on refinery spent caustic. Our installation list, experience and pilot testing facilities for wet air oxidation are unmatched.

Stripped sour water represents another in-process stream that contributes to the costs of operating the "end-of-pipe" biological plant. The use of site-specific packaged RBC units to treat the phenolic compounds and ammonia is a prudent investment. By doing so, the loadings to the "end-of-pipe" treatment plant would be reduced significantly; also, the RBC units have extremely low operating and maintenance costs compared to other technologies.

Tank farm water draws often require complex treatment to ensure regulatory compliance. One solution is our Petro™ MBR system, which can produce an effluent suitable for reuse within the facility.



Our service engineers are highly skilled to analyze and evaluate any wastewater treatment issue in the petroleum industry, and make appropriate recommendations for corrective action.

More than 2,500 wastewater treatment installations across the petroleum and petrochemical industry worldwide.

Wastewater Treatment Services

Expert Services

As the global leader in providing wastewater treatment solutions to the petroleum industry, Siemens Water Technologies offers our clients unequaled experience in cost effective wastewater management.

Partnering with us to evaluate and address wastewater treatment issues can result in significant operational and capital cost savings, significant improvements in operations and regulatory compliance. This is what we are best at doing, leaving you free to focus your capital and personnel on raising the profitability of your core business.

The significant installation base we have in the petroleum industry has allowed us to accumulate a vast amount of operational experience in wastewater treatment operations, in how refining and petrochemical operations affect wastewater treatment, from all over the world.

From this database we can provide analysis of your wastewater treatment operations and make suggestions on improvements that can reduce operating costs and improve performance.

An effective, accountable wastewater management plan customized to your facilities. As part of our core business, we offer a full range of engineering studies and services for the petroleum and petrochemical industry using a devoted team of industry experts. This team of experts is focused on, and has extensive multi-national experience in, dealing with water and wastewater treatment issues. They have performed studies in petroleum facilities all over the world including Europe, Middle East, Asia, Australia, Latin America and North America.

Expert engineering services. Our engineering studies and services group uses our wealth of application

and operational knowledge to offer cost effective water and wastewater solutions to the petroleum industry. The consulting and engineering services we provide include field investigations, wastewater characterization, feasibility and treatability studies, source control and segregation, waste minimization, solid waste treatment, operator training, process and plant design and many other value added services.

Waste Minimization Engineering Studies. Our intimate knowledge of, and in-depth experience in, the petroleum and petrochemical industries, has allowed us to achieve great success in waste reductions, recycle/reuse and source control of valuable hydrocarbons and other products. We've worked with refineries, distribution sites, petrochemical plants and oil/gas production sites worldwide.



We supply a wide range of high quality liquid and vapor phase carbons.



We offer carbon adsorber systems that can be mobilized quickly.

Services to Support Your Needs

Specialized Services for the Petroleum Industry

Siemens Water Technologies laboratories are RCRA certified to perform bench scale treatability studies on almost any waste. Our field pilot units range from multiple types of oil/water separators to biological treatment systems to sludge dewatering to tertiary treatment systems, designed to meet strict discharge requirements, or to recycle and reuse treated effluent within the facility. Multiple pilot units can be combined to simulate entire treatment systems.

Mobile water services. We also offer a wide variety of temporary wastewater treatment systems that can be used during maintenance on existing equipment or under conditions when existing operations do not have enough capacity. This temporary equipment includes dissolved air flotation separators, clarifiers, wastewater filtration

equipment, activated carbon adsorbers, and even microfiltration and reverse osmosis systems for wastewater reuse/recycle. These mobile treatment units come with experienced service technicians that can either train your personnel to operate the equipment or that can operate the equipment for you.

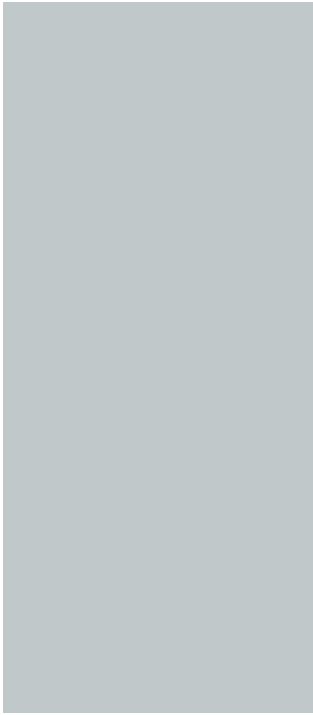
Total hazardous waste management. Siemens Water Technologies also specializes in both on-site and off-site management of hazardous and nonhazardous wastes – including emergency spill response and oily wastewater treatment. We take care of a variety of liquids and materials, including used oil, oil-water mixtures and emulsions, fuel-water mixtures, ethylene glycol and used oil filters and absorbents.

Guaranteed regulatory compliance, within the design parameters of your operation. Our customers include some of the world's largest

companies – many operating under the most stringent regulatory conditions – who rely on our processes, equipment and knowledge to assure compliance.

In addition, we can provide the petroleum industry with turnkey services in the application of activated carbons for specific needs. Our services include pretreatment for the production of high-purity water, wastewater treatment, VOC emission control, purifying/decolorizing off-spec products, and benzene NESHAP carbon canister monitoring in refineries.

Our comprehensive services are backed by an extensive spare parts inventory that covers every one of our products. Our field technicians across the nation are fully trained to meet every operating, safety and environmental requirement within the petroleum and petrochemical industries.



Siemens Water Technologies Milestones

Backed by over 70 years of continuous experience in offering new, innovative and cost effective wastewater treatment solutions to the petroleum industry, Siemens Water Technologies can provide everything from individual product designs to complete wastewater and groundwater treatment facilities.

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| 1909 | Rex® traveling water screen developed | 1982 | First U.S. installation of Zimpro® wet oxidation system for ethylene spent caustic treatment starts up |
| 1928 | Tow-Bro® hydraulic sludge removal arm invented | 1984 | SBC® system invented by Envirex |
| 1929 | Envirex® chain and scraper sludge collector developed | 1984 | Introduction of OMNIFLO® SBR |
| 1931 | Rex® bar screen developed | 1985 | Traveling bridge filter invented |
| 1937 | Envirex® API oil/water separator invented | 1986 | Envirex® loop chain for API collectors invented |
| 1953 | Envirex® dissolved air flotation separator invented | 1986 | VLR® system invented by Envirex |
| 1954 | F.J. Zimmermann obtains patent for waste treatment using wet oxidation | 1986 | Rex-Flex® aeration system developed |
| 1957 | Rim-Flo® clarifier invented | 1987 | Fluidized bed process invented |
| 1964 | Envirex® solids contact clarifier developed | 1990 | Envirex® dissolved gas flotation separator developed |
| 1965 | Hydro-Clear® filter introduced | 1990 | Envirex® fiberglass VOC containment covers invented |
| 1968 | Orbal® aeration system introduced in the U.S. | 1992 | Westates® activated carbon reactivation facility opens |
| 1969 | Envirex® rotating biological contactor system invented | 1995 | Gravisand® filtration system invented |
| 1972 | PACT® system invented | 1996 | Folded Flow® DAF invented |
| 1975 | First Zimpro® wet oxidation system installed for treatment of ethylene spent caustic starts up in Japan | 1999 | Envirex/ Envirogen MTBE Treatment Partnership |
| 1976 | Envirex® non-metallic molded chain and fiberglass flights for API collectors invented | 2003 | Cannibal® Solids Reduction system |
| 1980 | VARI-CANT® jet aeration system | 2003 | USFilter and Paques bv of the Netherlands sign license agreement |
| 1981 | Jet aeration invented | 2006 | Petro™ Membrane Bioreactor system introduced |

Auto-Shell, Bionutre, Cannibal, DualAir, Envirex, Folded Flow, Gravisand, Hydro-Clear, Hydrocell, OMNIFLO, Orbal, PACT, Petro, Quadricell, Rim-Flo, SBC, Sim-Pre, Surfact, Tow-Bro, VARI-CANT, VertiCel, VLR, Westates and Zimpro are trademarks of Siemens, its subsidiaries or affiliates. AGAR is a trademark of AqWise - Wise Water Technologies Ltd. Rex and Rex-Flex are trademarks of Rexnord Industries LLC.

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phone: 1.724.772.0044
petroleum.water@siemens.com

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