



MYCELX

A Whole New Dimension
in Oil-Free Water

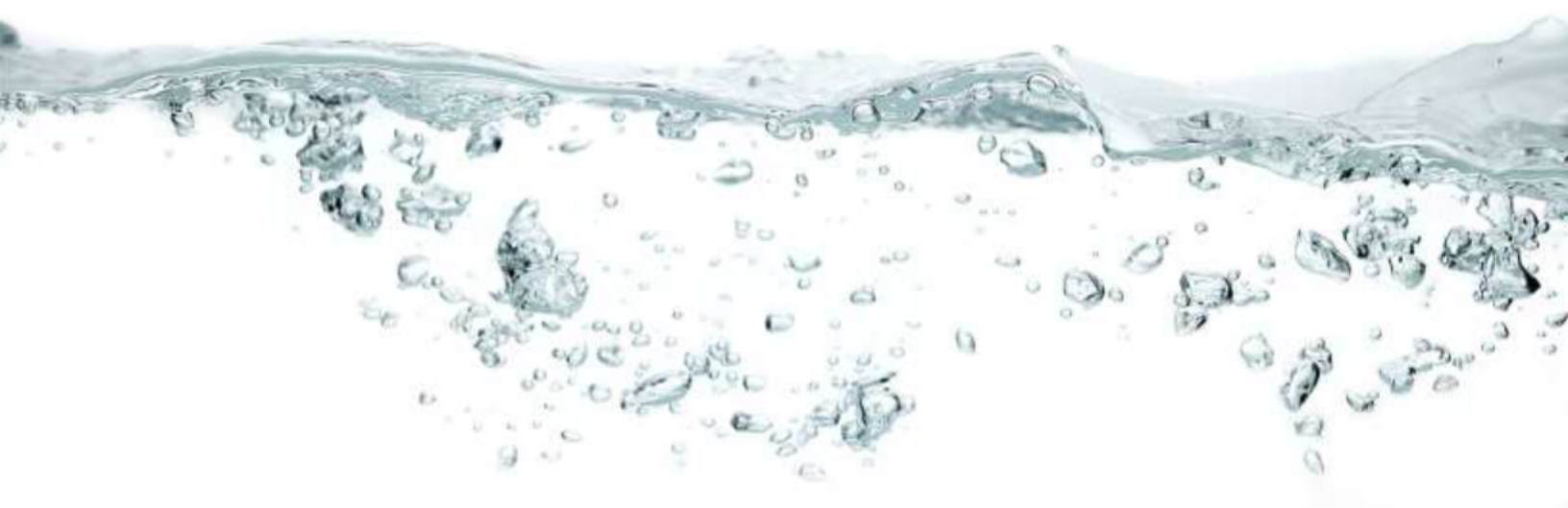


Winner of the 2015

**Water Management
Company of the Year**

Statement of Qualifications

2020 MYCELX Technologies Corporation



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Company Overview

HISTORY

In 1989, in the wake of the disastrous Exxon Valdez oil spill, scientist and inventor Hal Alper was distressed at the primitive and ineffective methods being used in the cleanup. Hal took action and began five years of research that led to the creation of the MYCELX® polymer. Working with the visionary oil executive, John Mansfield, Sr., the patented MYCELX polymer was commercialized and developed into an industrial-strength, advanced oil-removal solution to safely and effectively separate oil from water both instantaneously and permanently.

APPLICATION OVERVIEW

Offshore



Onshore



Enhanced Oil Recovery



Pre R.O. Treatment



Heavy Oil Production



Turnarounds



Mobile Treatment Units



Terminals



Mercury Removal



PCB Removal



Spill Response



Bilge and Marina



Power Generation



Oily Air



Manufacturing/Industry



Wash Water





Over the past 20 years, MYCELX has become a critical component of leading-edge water treatment technology within the oil and gas industry as well as bilge water and other related streams. With over 70 global patents, MYCELX® chemistry embodies novel properties previously unavailable which are especially useful in reversing dispersive processes such as emulsification and aerosolization.

Our Mission: To reduce the environmental impact of industry through science and technology.

MYCELX is headquartered outside of Atlanta in Duluth, Georgia with offices in Houston Texas, Al-Jubail Kingdom of Saudi Arabia, United Arab Emirates and United Kingdom. Publicly quoted since 2011, MYCELX is listed on the Alternative Investment Market (AIM) of the London Stock Exchange as MYX.

MYCELX MAXIMIZES YOUR PROFITS

We are an environmentally responsible, oil-free water technology company whose scientific breakthrough in removing oil from water is helping to solve the oil and gas industry's toughest problems without sacrificing profits. Our patented technology removes oil to your specific discharge or reuse requirements, even as low as less than 1 part per million (ppm). Complete MYCELX engineered water treatment systems allow producers to recycle and reuse produced water while recovering up to 95% of the inlet oil through our primary and secondary treatment stages.

Fail-Safe Reliability and Performance

MYCELX systems remove oil to critically low levels in a much smaller physical footprint than conventional systems and in a virtually fail-safe process. What's more, our solutions, are simple to retrofit into an existing water treatment process and can be implemented in any part of your water treatment train.

Optimized Treatment with Water Characterization Expertise

MYCELX employs a full spectrum of proprietary solutions in varying stages to maximize results and profitability. By utilizing our internally developed unique water characterization methodology, we help you determine the appropriate technology and stages of media to ensure optimal performance at the lowest cost.

MYCELX Technology Overview

- Instant and Permanent Oil Removal at Any Flow Rate
- Broad Oil Removal Spectrum – Free Oils to Emulsified Oils
- Small Footprint Available with Rapid Deployment Rentals Readily Available
- Low Capital Cost with the Highest Efficiency
- Enables Water Reuse and Oil Recovery
- Reduces the Need for Chemicals or Biological Treatment
- Guaranteed No Visible Oil Sheen in Effluent

THE MYCELX EFFECT: BEYOND ORDINARY FILTRATION

At the heart of our systems is the patented polymer, called MYCELX® (CAS#'s: 173967-80-1, 173967-81-2), which instantly and permanently removes oil and hydrocarbons from water to previously unattainable levels. And it does this under a wider range of conditions and flow rates than ever before, regardless of loading and droplet size. The core technology is based on a polymer invented by MYCELX, which has a very high affinity for oil and repels water.

The MYCELX polymer does not simply filter or hold oil as other approaches do; it instantly bonds with and permanently removes oil and contaminants upon contact through molecular cohesion, resulting in true oil-free water. Once oil comes in contact with MYCELX, it will never reenter the water stream.



Above: Crude oil added to a beaker, MYCELX liquid polymer chemistry added, once the polymer comes in contact with the oil, it forms a cohesive singular mass.

MYCELX® TECHNOLOGY APPLIED



- Basis of the technology is the MYCELX polymer that was invented in 1994.
- MYCELX polymer is made of naturally occurring food grade oils with no by-products.
- MYCELX polymer is permanently infused on the substrates or products (coalescing media, back washable media and polishing media) through proprietary processes.
- MYCELX systems are custom designed to deliver the MYCELX media as well as utilize the properties of the MYCELX media optimally.
- MYCELX objective is to remove oil from water to required discharge limit irrespective of the inlet concentration or degree of dispersion.

MYCELX's technology relies on the physical and chemical properties inherent in the polymer named MYCELX® (CAS#'s 173967-80-1, 173967-81-2). This polymer is manufactured by MYCELX Technologies Corp. and applied to substrates via a proprietary process that is monitored by QC/QA in accordance with ISO 9001:2015 guidelines (Cert # 32204-2008-AQ-USA-ANAB).

The polymer is sourced from reagents including naturally occurring food grade oils. These oils form the building blocks of the polymer and sourced specifically for their broad hydrocarbon structures. They are also a naturally occurring renewable resource.

The resulting polymer is inherently oleophilic and hydrophobic. The patented process used for applying this polymer to a substrate forms complete functionalization of the substrate surface, transferring these properties fully to the surface area of the substrate.

Control of the process allows for multiple degrees of freedom in the polymer formation; including chain length, side group identity, and degree of saturation.

With MYCELX, oil is removed from a fluid by contacting suspended droplets or particles of oil against a MYCELX functionalized surface. The methods of contact are well understood in particulate filtration as

interception, inertial impaction, and diffusion. Once hydrocarbon contacts the surface, it wets out against the MYCELX polymer, due to the strong attraction of MYCELX to hydrocarbons. At this point the arrangement is analogous to an adsorption system with a boundary layer of oil adsorbate on the MYCELX surface. As oil continues to impact the surface, it is bound to a thicker and thicker adsorbate layer, until the shear stress acting on this larger surface area by the surrounding liquid flow overcomes the attractive forces of the oil to the MYCELX and the oil to itself.

It is at this maximum holding capacity that MYCELX substrate is used in different manners. In primary treatment (MYCELX Advanced Coalescers) the resulting droplets that are sheared off are much larger than the incoming droplets, performing coalescence. The substrate packs, and containing vessels are designed to allow these coalesced large droplets to accumulate in a skim layer and the layer is removed.

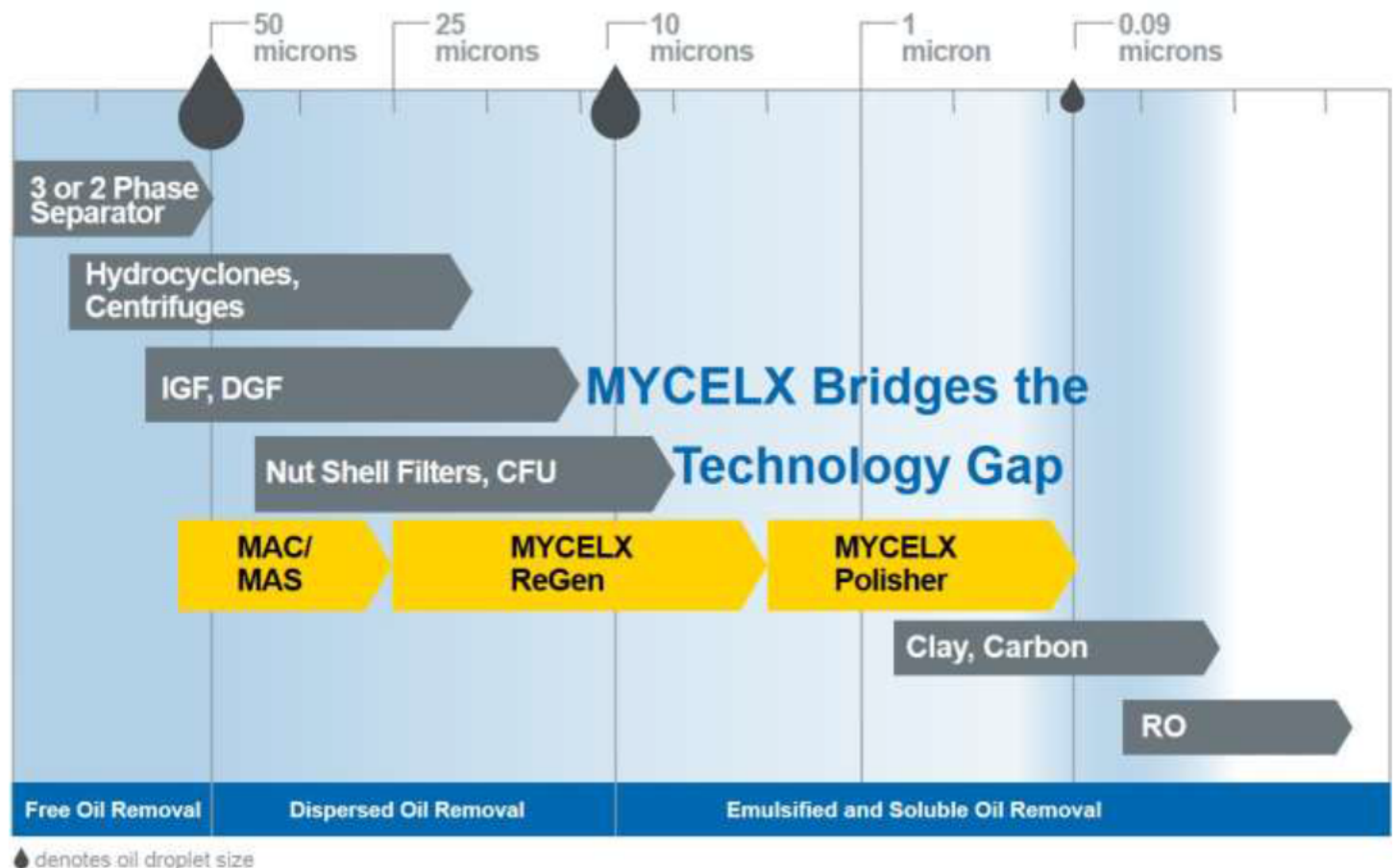
In secondary treatment (MYCELX REGEN), shear is artificially introduced to granular media functionalized with MYCELX polymer to remove accumulated oils. This occurs during a time of filter bed fluidization to remove both solids and oils into a small waste stream. The waste stream is diverted from the process and is separated to recover oil to sales and solids to waste.

In tertiary treatment (MYCELX Polisher) the oil droplets are much smaller (< 10 microns) and the substrate fibers surface area are much higher per unit volume of substrate. Also present at this juncture is very small suspended solids and colloids that form complex dispersions. The substrate is operated to its holding capacity and then physically removed from flow by a manual operation to be disposed of. It carries with it a large mass of oil that was accumulated from small droplets. This level of treatment is a consumable as removal of the oil from the large surface area spread over small fiber diameters is difficult and would require high shear rates.

MYCELX BRIDGES THE TECHNOLOGY GAP

The key differences between MYCELX and other oil removal processes are:

- Instant and permanent oil removal at any flow rate
- Broad oil removal spectrum – free oils to Emulsified oils
- Small footprint available, lower capital cost, highest efficiency
- Enables water reuse
- “Baked in Chemistry” reduces or eliminate need for chemical or biological treatment
- Robust designs allow for process upsets, and continue to provide on spec water to downstream processes or discharge
- Guaranteed no visible oil sheen in effluent



MYCELX Oil Removal Systems

COMPARISON TO CONVENTIONAL TECHNOLOGIES

Parameters	MYCELX System	API/CPI Separator	Float Cells	Hydrocyclone	Walnut Shell
Oil Droplet Size Removal	Removes all droplets >1 micron	Removes all oil droplets >50 microns	Removes all oil droplets >20 microns	Removes all oil droplets >30 microns	Removes oil droplets >10 microns
Oil in Water Discharge Capability	0-1 ppm	80-400 ppm	50-150 ppm	60-250 ppm	5-10 ppm
Waste Generation	Recovered oil byproduct for reuse	30-50% oil in water waste generated	50-60% oil in water waste generated	30-50% oil in water waste generated	30-50% oil water waste with chemicals generated
Footprint	Small	High Residence Time of 10 – 15 minutes	Large	Small but cannot remove dispersions/emulsions	Medium but cannot remove emulsions

TYPICAL APPLICATIONS AND PERFORMANCE

MYCELX solutions can be found in Produced Water, Process Water, Pre-Reverse Osmosis Treatment, Storm Water and Commercial Marine Applications

Produced Water Applications are both upstream (onshore and off shore) and downstream

Installations range in size from 5 gpm - 10,000 gpm or 1 m3/hr - 2,300 m3/hr.

Applications

Performance

Produced water treatment
upstream applications: water,
polymer, surfactant polymer,
alkali surfactant polymer, CO2
flood and SAGD

Oil Removal to 5-10 ppm

O&G process water treatment
downstream applications:
refineries, petrochemical plants

Oil Removal to less than 1 ppm

Reverse osmosis fouling
protection

Complete removal of oil and hydrocarbons.
Reduction of organic bio fouling of membranes.

Process wastewater treatment

Removal of oils, hydrocarbons and solids to meet discharge into surface
water bodies.
Recycle and reuse of oily wastewater for process water.

Storm water and wash water

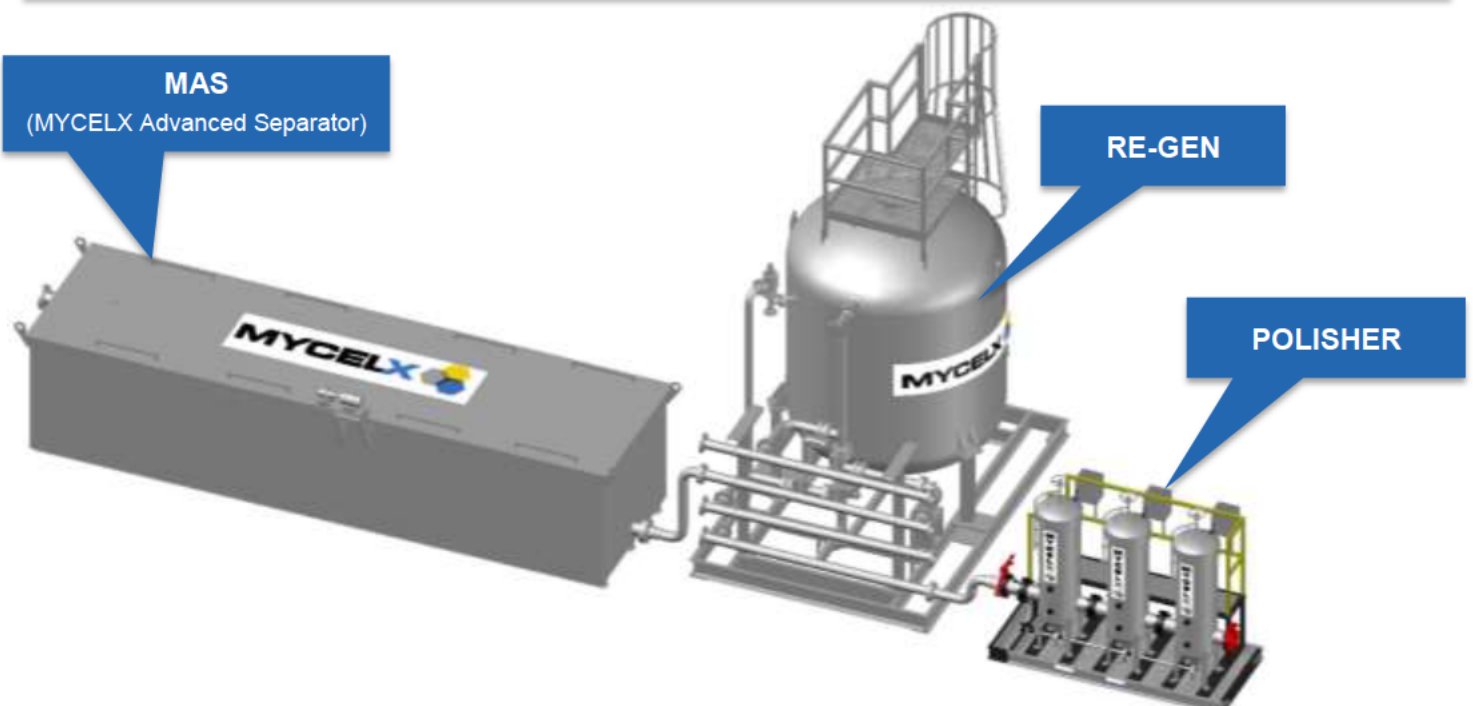
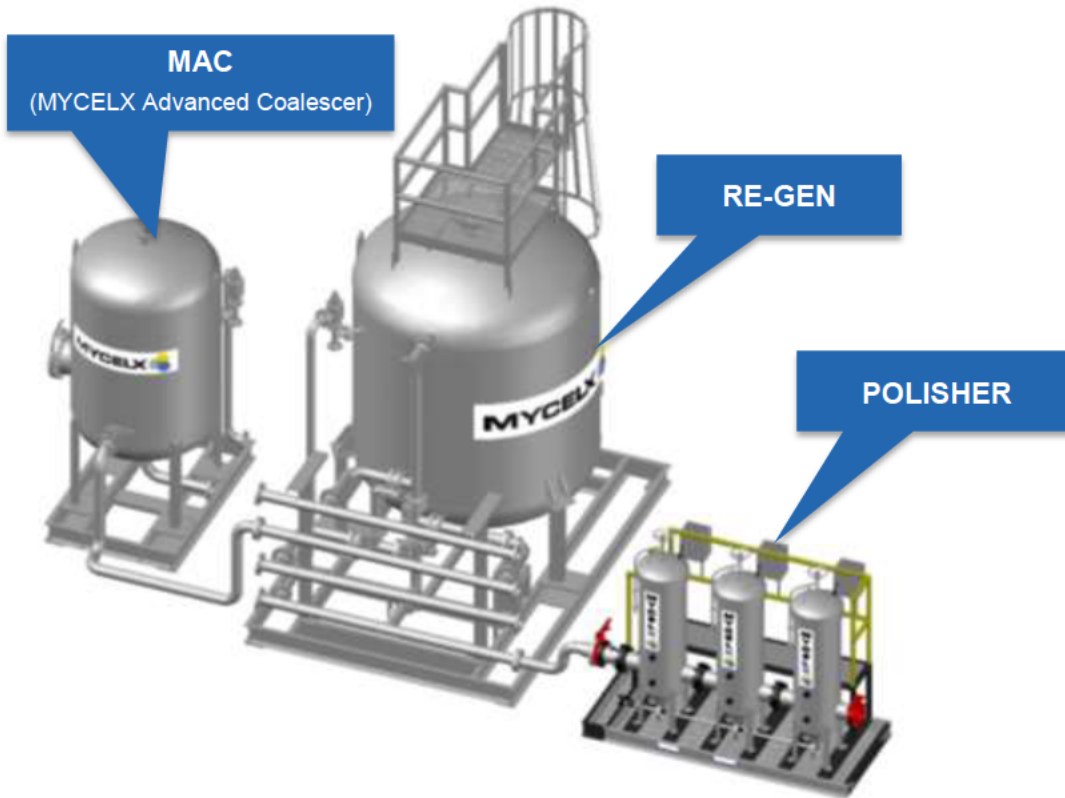
Meets less than 15 ppm marine discharge specifications on oil.
Solids Removal > 75-80% if required

Cooling water and condensate
recycle

Oil Removal from cooling water and boiler condensate to less than 1 ppm.
Prevent blow down, save process water and treatment costs, reduce
maintenance and prevent critical process shut down

COMPLETE SYSTEMS

Our standard oil removal systems consists of three stages; either a MAC or MAS for primary treatment, followed by our RE-GEN for secondary treatment and our polisher for tertiary treatment.



PRIMARY TREATMENT

MYCELX Advanced Coalescer (MAC)

The MAC primary treatment system is a vertical pressure vessel that is fed from the production treatment train by existing pressure source. It has no moving parts and is effective at removing free oil greater than 50 microns in diameter. The MAC incorporates proprietary MYCELX coalescing media packs to deliver superior coalescing and oil recovery when compared to conventional API/CPI Separators. This allows for higher single pass removal efficiency, and imparts simplicity of use which is unavailable in complicated flotation units. High purity oil is the recovered product.



MAC Skid

MYCELX Advanced Separator (MAS)

The MYCELX Advanced Separator primary treatment system is a horizontal atmospheric vessel fed by gravity or through the use of pumps, depending on existing on-site facilities and pressure. It has no moving parts and is effective at removing free oil greater than 40 microns in diameter and suspended solids/ sludge entrained in the water stream. The MAS incorporates proprietary MYCELX coalescing media packs to deliver superior coalescing and oil recovery when compared to conventional API/CPI Separators. This allows for higher single pass removal efficiency, and imparts simplicity of use which is unavailable in complicated flotation units.



MAS Unit with Visual Oily-Fluid Breakthrough Indicator (VOBI)

Primary Treatment Comparison to Conventional Technology

MYCELX Primary Treatment (MAC and MAS)

Standard API/CPI Separator

MAC: Oil removal to less than 50 microns
MAS: Oil removal to less than 40 microns

Oil removal when droplets >
100 – 200 microns for API, 100 microns for CPI

Removes free and some dispersed oils

Removes only free oils

Four-stage coalescing

One or two stage coalescing

Handles up to 40,000 ppm influent

CPI handles only up to 3,000 ppm

SECONDARY TREATMENT

MYCELX RE-GEN System

The secondary treatment system, MYCELX RE-GEN, consists of a deep bed media in a filtration arrangement, mounted inside a pressure vessel. The RE-GEN system incorporates a proprietary mined mineral granular backwashable media modified with MYCELX chemistry and optimizes the efficiency of the MYCELX Polishers within the tertiary stage. Used in produced and process water, it provides an economically viable treatment option to remove oils and oily solids to as low as 4 microns. During backwash, all oil trapped on and between the media is recovered to the customer without any chemical denaturing.



40,000 bpd RE-GEN Skid

Secondary Treatment Comparison to Conventional Technology

MYCELX RE-GEN

Walnut Shell / Multi-Media

Oil and particle removal to 4 microns

Oil and particle removal to 10 microns

Removes free, dispersed and fractions of emulsified oils

Removes free and some dispersed oil

Handles fluctuations 50 – 1,000 ppm

Cannot handle fluctuations in oil loading

Does not require usage of pre-filtration chemical agents to meet stated efficiency

Requires the use of pre-filtration chemical agents to meet state efficiency

TERTIARY TREATMENT

MYCELX Polisher System

The MYCELX Polishers are the tertiary treatment, which consistently provides fail-safe protection against upset conditions. The patented polishing media instantly and permanently removes oil and grease, never desorbing or saturating with water. MYCELX Polishers achieve critically low discharge levels (less than 1 ppm) or the system can be engineered to achieve various discharge levels depending on the end user's requirements. The controlling tertiary treatment elements for MYCELX to design to are oil type (fingerprint, carbon chain length, etc.), droplet size, presence of dispersants/emulsifiers and other oilfield chemicals, and the normal physical stream properties like flow, temperature, pressure, pH etc. Capture efficiency and holding capacity are not negatively affected by dissolved solids or specific ions.



Tertiary Treatment Comparison to Conventional Technology

MYCELX Polishers

Activated Carbon / Clay Filtration

Complete oil removal to 0 – 5 ppm (free, dispersed and emulsified)

Only economical for soluble oils (activated carbon)

Two to four times as many polisher skids fit into the space of one carbon or clay unit

Large footprint and weight

Robust to process upsets with fail-safe discharge

Cannot handle process upset conditions

Easy to install and operate. Labor time required for media replacement on a 10,000 bbl/day system is 45 minutes for two operators.

Labor time required for carbon/clay media replacement on a 10,000 bbl/day system is 8 – 12 hours for two operators and mechanical lifting equipment.

FAST DEPLOYMENT RENTAL UNITS

ONSHORE SYSTEMS AVAILABLE FOR RAPID DEPLOYMENT			
SYSTEM CONFIGURATIONS	FLOW RATE	WEIGHTS & DIMENSIONS FOR INDIVIDUAL COMPONENTS	REMOVAL CAPABILITIES
 <p>Manual Two RE-GENs with One 1x3xMX60 Polisher</p>	20,000 BPD	<p>RE-GEN: 20,000 lbs (59,200 lbs w/ Media) 300" L x 96" W x 124" H</p> <p>1x3xMX60 Polisher: 6,000 lbs (6,600 lbs w/ Media) 139" L x 84" W x 84" H</p> <p>2x3xMX52 Polisher Container: 22,000 lbs 240" L x 96" W x 114" H Operational and Standby</p>	<p>RE-GEN units reduce Total Suspended Solids (TSS) down to 5 microns.</p> <p>Polisher units reduce oil and grease down to 10 ppm with the capability to discharge at 1 ppm, if required.</p>
 <p>Manual RE-GEN with Two 1x3xMX15 Polishers</p>	10,000 BPD	<p>RE-GEN: 4,500 lbs (14,800 lbs w/ Media) 89" L x 65" W x 130" H</p> <p>1x3xMX15 Polisher: 1,550 lbs (1,700 lbs w/ Media) 100" L x 36" W x 64" H</p> <p>1x3xMX60 Polisher: 6,000 lbs (6,600 lbs w/ Media) 139" L x 84" W x 84" H</p>	<p>From TSS, oil and grease removal capabilities to iron and bacteria control, MYCELX systems offer the most robust, cost effective technology for produced water applications.</p>
 <p>Manual RE-GEN with One 1x3xMX60 Polisher</p>			
 <p>Automated RE-GEN with Two 1x3xMX7 Polishers*</p>	5,000 BPD	<p>RE-GEN: 5,500 lbs (13,200 lbs w/ Media) 120" L x 84" W x 132" H</p> <p>1x3xMX7 Polisher: 1,325 lbs (1,395 lbs w/ Media) 84" L x 30" W x 55" H</p> <p>1x3xMX15 Polisher: 1,550 lbs (1,700 lbs w/ Media) 100" L x 36" W x 64" H</p>	
 <p>Automated RE-GEN with One 1x3xMX15 Polisher*</p>			
OFFSHORE SYSTEMS AVAILABLE FOR RAPID DEPLOYMENT			
<p>20,000 BPD with 100% Redundancy</p>  <p>2x3xMX60 Framed Polisher Unit Weights and Dimensions: 18,000 lbs Empty (29,500 lbs Operating) 187" L x 120" W x 100" H</p>	<p>18,000 BPD with 100% Redundancy</p>  <p>2x3xMX52 Containerized Polisher Weights and Dimensions: 22,000 lbs Empty (30,500 lbs Operating) 240" L x 96" W x 114" H</p>	<p>18,000 BPD with 100% Redundancy</p>  <p>2x3xMX52 Framed Polisher Unit Weights and Dimensions: 23,000 lbs Empty (31,500 lbs Operating) 240" L x 113" W x 129" H</p>	<p>7,000 BPD with 100% Redundancy</p>  <p>2x3xMX20 Framed Polisher Unit Weights and Dimensions: 13,000 lbs Empty (17,500 lbs Operating) 137" L x 88" W x 109" H</p>

Certifications

LLOYD'S REGISTER CERTIFIED

Influent 100,000 PPM; Effluent <0.5 PPM

 Lloyd's Register EMEA 71 Fenchurch Street, London, EC3M 4BS Telephone 020 7423 3426 Fax 020 7423 2053 Email: enquiry@lr.org		Page 4 of 5 Document number SAS P130001 Issue number 1			
DESIGN APPRAISAL DOCUMENT					
Date 16 April 2013		Quote for reference to all future communications LISO/SFS/MARPOL/NA5			
ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS P130001					
The type approval certification for the MCB 5.0 model is based on the tests conducted on similar equipment having capacity of 1.0-2.5 m ³ /hr (MCB 1.0/2.5) using Test Fluid "C" emulsion as specified in IMO Resolution MEPC.107(49), Annex Part 1, at a concentration up to 3000ppm to an effluent oil concentration and flow rate as tabulated below:					
TEST NUMBER	SAMPLE DATE	RECEIVED DATE	REPORT DATE	HYDROCARBON INDEX ppm Influent	COLOUR Effluent
TEST 1 (50 - 51) 0.5 m ³ /hr	07-Sep-04	13-Sep-04	20-Sep-04	50,000	0.45
TEST 1 (54 - 55) 0.5 m ³ /hr	07-Sep-04	13-Sep-04	20-Sep-04	100,000	0.14
TEST 1 (56 - 57) 0.5 m ³ /hr	07-Sep-04	13-Sep-04	20-Sep-04	100,000	0.21
TEST 1 (58 - 59) 0.5 m ³ /hr	07-Sep-04	13-Sep-04	20-Sep-04	50,000	0.14
TEST 2 (510 - 59) 1.0 m ³ /hr	07-Sep-04	13-Sep-04	20-Sep-04	50,000	0.37
TEST 3 (512 - 511) 1.5 m ³ /hr	07-Sep-04	13-Sep-04	20-Sep-04	150,000	0.16
TEST 4 (514 - 513) 1.5 m ³ /hr	07-Sep-04	13-Sep-04	20-Sep-04	100,000	0.23

ISO 9001:2015

DNV-GL		
MANAGEMENT SYSTEM CERTIFICATE		
Certificate No. 20129-1000-03-000-0000	Initial certification date 26, July, 2012	Valid 26, July, 2017 - 26, July, 2020
This is to certify that the management system of		
MYCELX Technologies Corporation 2420 Meadowsbrook Parkway, Duluth, GA 30096 USA		
has been found to conform to the Quality Management System standard: ISO 9001:2015		
This certificate is valid for the following scope: The Manufacture of Filtration Products to Separate Oil from Water and Air.		
Place and date: Røly, 15, 06, June, 2017		For the issuing office: 2007 GL - Business Assessment 1400 Riverside Drive, Røly, TN, 37349 USA  John C. Stief Management Representative
Each of holders of certificate is to use it in the Certification document and under this Certificate is valid.		

Awards

GLOBALLY RECOGNIZED AWARD WINNING TECHNOLOGY

- Water Management Company of the Year Winner: *2015 Oil and Gas Awards, Gulf Coast Region*
- Global Water Award Finalist: *GWI Summit 2013 (Industrial Water Sustainability, MYCELX and SABIC)*
- New Technology of the Year Award: *Offshore Technology Conference 2011*
- Platts Global Energy Award for Sustainable Technology Innovation Finalist: *(MYCELX and SABIC, 2010)*
- Platts Global Energy Award for Environmental Project of the Year Finalist: *(MYCELX and Anadarko, 2009)*
- Federal Exporting Award from the U.S. Department of Commercial Service



Houston Engineering Team Members Accepting the Water Management Company of the Year Award

Customer Highlights

Key Customers	Industry	Applications
Anadarko, BP, Cairn India, SABIC, CNRL, Chevron, Qatargas, QChem, ONGC	Oil and Gas E&P, Petrochemicals, Pipelines and Terminals	Produced water from conventional process and Chemical Enhanced Oil Recovery (CEOR), SAGD, process wastewater, storm water and wash water
United States Army Corps of Engineers, Power and Utility Companies, Bechtel and ENKA	Energy – Power and Utilities	Process cooling water, wash water and condensate blowdown
Lockheed Martin, Toyota Motor Corporation, Honda Motors, General Motors Corporation and Daimler Chrysler	Manufacturing	Process cooling water, wash water and air filtration
GE, Siemens, Quaker Chemicals, Nalco and Abbott Ross	Water Production, Food Processing and Specialty Chemicals	Process makeup water, sea water desalination, and process water recycling
United States Armed Forces, U.S. EPA, NAVSEA, U.S. Department of Agriculture, NOAA and the U.S. Coast Guard	Federal and Government	Oily water filtration/reuse, HEPA/ULPA air filtration, and bilge water

Capabilities

MYCELX is staffed by excellent people that are able to execute the full range of water treatment systems.

- Typically, we start with the client to develop a solution by using our applications engineers, who are trained in hands on realities of water treatment processes and equipment.
- From application development, process engineering takes over and scales the unit processes together with the necessary equipment and controls to develop a fully-fledged system.
- Our in house mechanical engineering designs the equipment to specification in 3D CAD to quickly iterate on designs.
- Third party accredited fabricators (certified by the unit authority bodies) are supervised by our project engineers throughout the entire design, fabrication, and inspection/testing process, to deliver a solution ready to ship out and install at the customers site.
- We carry in house logistics and export brokers to serve any logistical need.
- Our Commissioning engineers and technicians stand ready to help erect, commission and train end users on the use of our equipment throughout the world.
- After sales support for consumables, warranty items and operations troubleshooting allow for a seamless transition to successful end user operation.

Previous Projects

Previous Experience #1	Year completed: 2017
a) Project & Location:	Complete Produced Water Treatment System, Nigeria
b) Client Name	Neconde Energy Ltd.
c) Business Model:	Capital supply of equipment, including three stages of process treatment, all connecting piping and pipe supports, all cable tray, cabling, controls, pumps and analyzers. Erection and commissioning support on site
d) Technology Description:	Field produces API 22 sweet crude, with naphtene instability. Client needs to retrofit gathering station from 2 phase separation, to full 3 phase. MYCELX scope is to take effluent water from three phase separator at ~ 10,000 mg/L O&G and 200 mg/L TSS content and remove to < 5 mg/L on both contaminants. Water will be discharged to ocean shallow water for phase 1. Phase 2 will use the clean produced water to pressurize formation (waterflood). MYCELX provided an advanced coalescer to remove oil droplets > 35 microns in size using high surface area coalescing packs. REGEN system was provided to remove oil droplets and solids > 5 microns in size. Lastly a polishing system was provided to polish any remaining oil to less than 5 mg/L based upon online analyzer feedback. MYCELX system manages all water flow from 3-phase separator and dehydrator packages (by others)
e) m ³ /day Capacity:	6,500



Previous Experience #2	Year completed: 2013
a) Project & Location:	Olenfins Quench Water Treatment, Kingdom of Saudi Arabia
b) Business Model:	BOO of process water treatment equipment
c) Client Name:	SABIC
d) Technology Description:	Petrochemical plant uses gas feedstock (changing ratios of C2/C3/C4+) and runs an olefins production using catalytic pyrolysis technique. Part of the process is to quench the pyrolysis product to remove any heavy oil reaction constituents (rich liquids) and purify the remaining stream of olefin gas. This oily residue is polymerized random chain length hydrocarbons, that have high process variability. The water stream must be reheated to steam in a dilution steam generator process to be reinserted into the quench tower. Removal of hydrocarbons from the ~ 10,000 mg/L inlet to less than 100 mg/L is required to run the gas fired heat exchangers properly.
e) m ³ /day Capacity:	3,350
f) Description of Project:	MYCELX designed, built, air-shipped, erected, commissions and operates the quench water treatment equipment that consists of all three process steps (advanced coalescer, REGEN, Polisher). Supporting equipment consists of charge pumps, complete piping system, all controls, and online monitoring. The project is extremely challenging, as feedstock and furnace loading is constantly shifting, producing oil contaminants that wax transition temperatures and highly emulsified streams.

Previous Experience #3	Year completed: 2014
a) Project & Location:	Grand Forks, Alberta Canada
b) Business Model:	Capital supply of equipment, and engineering support
c) Technology Description:	<p>Producer was doing a partial field polymer flood to test out production enhancement. At the same time they pinpointed where the polymer would be backproduced into the water stream, and wanted to test promising technology in the water gathering station to see if the polymer concentrations would allow for proper water treatment to recycle the water back into polymer mixdown for reinjection (separation, filtration, softening, ion exchange, then mixdown). System was purchased and ran for 2 yrs to gather data and make a judgement in the increase in production was cost effective.</p>
d) m ³ /day Capacity:	1,000
e) Description of Project:	<p>MYCELX provided two stages of water treatment equipment, and advanced coalescer and REGEN system. The water inlet to MYCELX was from a FWKO tank. Inlets were ~ 1,000 mg/L and outlets were less than 10 mg/L for the 2 year project. The viscosity of the backproduced water peaked at 2.2 cP. MYCELX provided compact skidded equipment that resided inside a temporary building to operate in the harsh environment. Client is now using the equipment at a separate facility that uses standard production techniques. It is now repurposed to debottleneck disposal wells. With oil prices returning to realm of reality for implementing a polymer flood on the field – the operator knows they have a proven method to process the water to remix.</p>

Previous Experience #4	Year completed: 2016
a) Project & Location:	Jack & St. Malo, Deepwater Offshore Platform in Gulf of Mexico
b) Business Model:	Supply of capital main equipment (Polishing filter vessels)
c) Client Name:	Chevron
d) Technology Description:	Customer has typical offshore treatment train of hydrocyclone and IGF separators. During early start up, or well swap operations, cold starts, bad weather or new chemical campaigns – transient emulsions would cascade through the treatment systems and cause excursions above allowable O&G discharge limit to the sea.
e) m ³ /day Capacity:	11,250
f) Description of Project:	MYCELX deployed a polisher unit for tertiary treatment after the existing treatment train, as well as in-line probe style analyzers for hydrocarbon content. With the analyzer loops – logic was written into the plant DCS to automatically switch flow into the tertiary treatment when required. MYCELX has been operational on this platform for 2 years and the average inlet when activated is ~ 108 mg/L. Average overboard discharge with the system is < 10 mg/L. This debottlenecks the oil production train, and enables 24/7 discharge without any worry of being over regulatory limits.



Previous Experience #5	Year completed: 2014
a) Project & Location:	BOSTCO Storage Terminal, Houston TX
b) Business Model:	Capital supply of all water treatment equipment, commissioning and training
c) Client Name:	Kinder Morgan
d) Technology Description:	Customer is a heavy distillate storage terminal (Fuel Oil of various grades, as well as gasoline and diesel). They have over 8 m bbls of storage on facility, with ship docks access to 4 pipelines and rail car siding. Wastewater is generated on site from a mixture of spills of product, drains gathered from maintenance areas, boiler blowdown, bilge water, and stormwater in contact with oils. The water must be treated to < 15 ppm O&G, < 200 ppm COD, and monitored for pH. The discharge is to the Houston ship channel.
e) m ³ /day Capacity:	2,500
f) Description of Project:	MYCELX provided all process equipment, controls, chemical storage facilities, pumps, instrumentation and analyzers. The process equipment consists of an atmospheric separator for heavier and lighter than water oils, a polisher filter, and an adsorption stripping column. Online analysis of O&G, pH and COD are tied into a feedback loop that treats the water to the correct specification with a minimum of consumables used. Unit has never exceeded discharge specification in 4+ yrs of operation.



Previous Experience #6	Year completed: 2011
g) Project & Location:	Blind Faith, Deepwater Offshore Platform in Gulf of Mexico
h) Business Model:	Supply of capital main equipment (Polishing filter vessels)
i) Client Name:	Chevron
j) Technology Description:	Customer has typical offshore treatment train of hydrocyclone and IGF separators. During early start up, or well swap operations, cold starts, bad weather or new chemical campaigns – transient emulsions would cascade through the treatment systems and cause excursions above allowable O&G discharge limit to the sea.
k) m ³ /day Capacity:	5,500
l) Description of Project:	MYCELX deployed a polisher unit for tertiary treatment after the existing treatment train, as well as in-line probe style analyzers for hydrocarbon content. With the analyzer loops – logic was written into the plant DCS to automatically switch flow into the tertiary treatment when required. MYCELX has been operational on this platform for 7 years and the average inlet when activated is ~ 280 mg/L. Average overboard discharge with the system is 4 mg/L. This debottlenecks the oil production train, and enables 24/7 discharge without any worry of being over regulatory limits.



FURTHER PROJECTS

Application	Size	Year Completed
Produced water treatment (MAS, REGEN, Polisher) for heavy oil producer in Europe – enabling water injection for secondary recover	1,600 m3/day	2012
VOC stripping using wet chemical oxidation and typical MYCELX technology, to enable discharge to sea or reuse in KSA	2,400 m3/day	2016
Produced water recycling for hydraulic fracturing fluid, multiple installations using REGEN and polisher technology, and some chemical conditioning to oxidize iron and flocculate – Permian Basin – Texas	1,000 to 4,000 m3/day	2014, 2016, 2017, 2018
Power plant condensate, drains and combined wastewater tertiary treatment to recycle for plant inlet raw water – Canada	900 m3/day	2017

More projects displayed at http://www.mycelx.com/what_we_do/