Why UF?

Double Duty - LiquiVap increases CO₂ recovery yield and lowers costs

Next generation 365it Complete PMO Mix Proof Valve
Pentair X-Flow – leading in membrane technology

GLOBAL WATER INTELLIGENCE (GWI), an INTERNATIONAL PUBLICATION THAT TRACKS MAJOR GLOBAL WATER PROJECTS, ANALYZED ULTRAFILTRATION (UF) AND MICROFILTRATION (MF) PLANTS WITH CAPACITIES OF MORE THAN 10,000 M³/D INSTALLED SINCE 2005. BASED ON THE 588 WORLDWIDE INSTALLATIONS CONSIDERED, PENTAIR X-FLOW HAS THE SECOND LARGEST INSTALLED BASE WITH A GLOBAL MARKET SHARE OF 18.6 PERCENT. WHEN CONSIDERING ONLY PROJECTS TENDERED/AWARDED IN 2009/2010 OR TO BE INSTALLED AFTER 2010, PENTAIR X-FLOW IS TRACKING AT A MARKET LEADER RACE WITH A SHARE OF 25.5 PERCENT, LEAVING SEVERAL REPUTABLE MANUFACTURERS BEHIND. PUBLISHED IN GWI’S DECEMBER 2010 ISSUE, THIS ANALYSIS OFFERS INSIGHT INTO PENTAIR X-FLOW’S MARKET POSITION AND THE GROWTH OF UF AND MF TECHNOLOGY.

Two key elements are believed to be at the basis of this market success: First, Pentair X-Flow has launched several unique solutions into high growth market segments including:

- **SEAguard**, the industry’s first dedicated seawater pre-treatment membrane module.
- Pentair Airlift™ MBR Megablock, a direct sludge filtration slipstream type equipment that represents the most cost, space and quality effective solution to meet stringent wastewater treatment directives and produce effluent with a quality suited for water reuse applications.

Though low-pressure MF and UF membranes have been available for 80 years, it has only been in the last 20 years that they have made serious inroads into the market. GWI’s conclusion is that today, by some measures, the technology has overtaken reverse osmosis in terms of market share. The MF/UF market developed in three key stages. The first stage was the spread of MF and UF for drinking water treatment in the US following the 1993 Cryptosporidium outbreak in Milwaukee. The next stage was the emergence of low-pressure membranes as a wastewater treatment solution during the late 1990s and early 2000s, reflecting growing interest in water reuse, and the smaller plant footprints offered by the membrane bioreactor for- mat. The third stage of market develop- ment came in the mid-2000s when the potential for low-pressure membranes as a seawater pre-treatment method for reverse osmosis was realized.

The GWI research shows that the Americas accounted for the largest market share until 2008. Since then, the Asia Pacific and EMEA (Europe, Middle East and Africa) markets each grow at a comparable rate and are now the Americas main- ly due to strong growth in the market for desalination pre-treatment and the continuing strength of the wastewater treatment sector. This has changed the competitive dynamics of the sector, much of it in favor of Pentair X-Flow.

Just prior to completing the acquisi- tion of Norit’s filtration business, Pentair, Norit was awarded the “Water Technology Company of the Year” by Global Water Intelligence. In April, during the Global Water Summit 2011 in Berlin, at a special Global Water Awards ceremony former Secretary General of the United Nations Kofi Annan handed the award to the Norit team.

Every year, Global Water Intelligence honors top performers in the world of water. The category “Water Technology Company of the Year” recognizes the company that has made the most significant contribution in the field of water technology during the past year.
Protection at the tap

Ultrafiltration is an effective barrier for microbials

The Water Quality Association’s leadership is working to encourage U.S. officials to understand that the most practical solution to water related issues is to integrate point-of-use (POU) into the current regulatory paradigm. “Our goal is to advance the understanding of policy makers about final barrier treatment of drinking,” said Peter Censky, executive director of WQA. “We begin with a premise that within 20 years the current paradigm – centrally treating water and working to encourage U.S. officials to understand the issues is to integrate point-of-use (POU) into the current regulatory paradigm. “Our goal is to advance the understanding of policy makers about final barrier treatment of drinking,” said Peter Censky, executive director of WQA. “We begin with a premise that within 20 years the current paradigm – centrally treating water and working to encourage U.S. officials to understand the current paradigm – centrally treating water and working to encourage U.S. officials to understand the current paradigm.”

Certified purification you can rely on Pentair’s HiOK WaterPurifiers, which use Pentair X-Flow UF membrane technology, are one of the few POU drinking water products available in the world certified by the Water Quality Association (WQA) to retain 99.95 percent of viruses and cysts and 99.999 percent of bacteria. They carry the WQA Gold Seal certification to both the US EPA Standard for Microbiological Water Purifiers and NSF 231.

Ultrafiltration membranes are hollow fiber straw-like structures with walls that consist of billions of microscopic pores that are smaller than viruses, bacteria, protozoa, and fungi,” said Anton van de Ven, Commercial Director at Pentair Filtrax. “They are the ideal barrier for microbiological outbreaks, which is why they were chosen for use in our WaterPurifiers.”

Pentair HiOK WaterPurifiers work on normal line pressure, use no energy, do not generate any wastewater in the filtering process, retain vital minerals, and do not alter the taste of the water. Membrane filters will block microbes up to the expiration date making sure no contamination can ever come through.

Clean, safe and easy The easiest and most economical way to ensure safe drinking water is to filter it at the tap. When choosing an in-home water treatment system, it is important to know that all POU filtration products are not the same. To ensure the safest, highest quality water possible, you should choose a filter that is certified to protect against viruses, cysts and bacteria, and removes chemical contaminants while delivering great-tasting, odor-free water. The Pentair WaterPurifier® that combines UF membranes and activated carbon provides this complete protection.

“Pentair HiOK WaterPurifiers are well positioned against other POU technologies on the market,” van de Ven said. “Overall, UF is an excellent and sustainable way to eliminate the uncertainty of microbiological outbreaks and ensure consistent delivery of high-quality water, without electricity or wasted water that other technologies require.”

German brewery

Ustersbach to install Pentair BMF system

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Guinness Anchor Berhad: Retrofitting with LiquiVap increases CO₂ recovery yield and lowers costs

Chuah Chong Sheng, project engineer for the brewery has two separate CO₂ systems in operation that were both supplied by Pentair Haffmans approximately 20 years ago.

Chuah Chong Sheng, project engineer for the CO₂ supply for GAB, gave his reflections on the past. “We simply weren’t able to produce enough of our own CO₂ with the existing system,” he said. “Each month, we had to purchase supplemental CO₂, which is complicated and expensive. Also, the refrigerant R22 was still used in this system, which is less than ideal from an environmental perspective.”

“Two immediately won over by this concept” In order to find an optimal solution for this problem, the brewery contacted Pentair Haffmans. Each of which are subsidiaries of Guinness Overseas Ltd and Malayan Breweries Ltd, respectively. The latter operates under the name Asia Pacific Breweries Limited (“APB”), based in Singapore.

Guinness Anchor Berhad (GAB) was founded in 1964 originally under the name “Guinness Malaysia Limited”. In 1966, the company changed its name to “Guinness Malaysia Berhad” and in 1989, the name was again changed to GAB that it operates under today. GAB is the product of a fusion between Guinness Malaysia Berhad and Malayan Breweries (Malaysia) Sdn Bhd (“MBM”), each of which are subsidiaries of Guinness Overseas Ltd and Malayan Breweries Ltd, respectively.

GAB operates the Sungai Way Brewery in Malaysia, which was commissioned in 1965. The brewery is located in the state of Selangor, where it produces Tiger, Guinness, Heineken, Anchor Smooth, Anchor Strong, Kilkenny, Anglia Shandy, and Malta. The plants’ capacity is approximately one million hectolitres per year. GAB occupies the leading position in the Malaysian beer market with a market share of approximately 57 percent.

Either APB or Guinness

The Sungai Way Brewery is the only one of its kind in the world. It consists of two production lines, completely separate from one another, in which only APB or only Guinness beers are brewed. The maxim here is: The products are not allowed to be mixed, not even the gases liberated from fermentation. Consequently, the brewery has two separate CO₂ systems in operation that were both supplied by Pentair Haffmans approximately 20 years ago.

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ReCOVery yield Can be ImprOVed fOr OLder systems. the sunGeI Way breWery OWned by GuInness anChOr berhad In maLaysIa Is a representatIVe Case as thIs

Guinness Anchor Berhad: Retrofitting with LiquiVap increases CO₂ recovery yield and lowers costs

““We have not had to purchase any more CO₂ and are operating more sustainably, as we now use less electricity.”

Chuah Chong Sheng, project engineer at GAB and responsible for the CO₂ supply, is completely satisfied with the results of retrofitting with the LiquiVap.

This idea was very convincing, since the existing plants were also manufactured by Pentair Haffmans,” Chuah Chong Sheng recalled. “We were already familiar with the products: they are capable of delivering and also the high level of service from Pentair Haffmans. Furthermore, we already have a LiquiVap unit at APB in Singapore, providing us with a means for comparison. It has been in operation there for more than a year.”

Evaporating CO₂ Cools fermentation gas

“Since commissioning these units, we have estimated that 70 percent of the CO₂ – not to mention that we have achieved this in conjunction with savings through utilizing sustainable energy as well. We are completely satisfied with all aspects of retrofitting with the LiquiVap.”

Chuah Chong Sheng, project engineer

“Evaporating CO₂ can be captured very efficiently from this process with the LiquiVap system. As the CO₂ evaporates, it liquefies the gaseous carbon dioxide coming from the activated carbon filters and dryers. In this manner, the energy is recovered that would otherwise be electrically fed into the refrigeration system. Additionally, the cooling capacities required of the refrigeration systems are significantly lower.”

When undertaking the expansion of a CO₂ recovery system, very low process energy savings in both the cooling and heating stages of the process are the result.

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A three-phase project in Gothenburg, Sweden to increase production capabilities of purifying surface water to drinking water will use Pentair X-Flow’s ultrafiltration (UF) technology. Gothenburg, the second largest city in the country, is located on the west coast of Sweden. The city’s water treatment facility must supply approximately 500,000 consumers with drinking water using surface water and river water from the Göta River.

The three phases of the project will increase water production to meet demand and high-quality standards. Phase one will produce 1,800 m³/h by 2013, Phase two, 3,600 m³/h in 2015, and Phase three, 7,000 m³/h in 2017. In the first phase of the project, a UF plant with four Pentair X-Flow skids, each equipped with 36 pressure vessels containing XIGA UF membranes, will be installed in an existing water production plant. By the end of Phase three, 18 skids will be installed. Pentair X-Flow has partnered with Purac, a prestigious Swedish contracting firm, for this project.

In the treatment process, surface water is coagulated and, after settling, sent through granular activated carbon filters. The output of the carbon filters is transferred through the UF membrane system. Once constructed, with a capacity to process 300 MLD of raw water into drinking water, the Lower Seletar Waterworks will be one of the largest drinking water plants in Singapore that utilizes UF at the front of its treatment process. It is also the first drinking water plant in Singapore to use a pressurized UF membrane system.

Pentair X-Flow’s XIGA UF membranes are widely used throughout the world for large-scale drinking water production and effluent reuse. They are horizontally mounted membranes housed in pressure vessels. The pressure vessels are stacked on a skid to reduce the footprint, which makes Pentair X-Flow’s XIGA UF membrane system well suited for the Lower Seletar plant’s limited footprint. In addition, the absolute pore size of XIGA membranes ranges from 0.025 to 0.001 microns making XIGA one of the tightest in its class. This enables high log removal for both bacteria and viruses.

Once constructed, the treatment plant will produce 27,712 m³ (6 million gallons) per day. This production could potentially reduce the cost of desalination by 50 percent. Engineers and Constructors (Sembawang), one of the leading engineering and construction companies in Southeast Asia, was selected to design and build the treatment plant for the Lower Seletar Waterworks project in Singapore to be constructed by Sembawang Engineers and Constructors (Sembawang), one of the leading engineering and construction companies in Southeast Asia.

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Pentair X-Flow’s XIGA UF membrane technology provides a credible and proven alternative to the desalination of seawater for non-potable applications. By supplying UF technology to the ADSSC’s Al Wathba TSE polishing plant, Pentair X-Flow reinforces its position as the UF market leader in the Middle East.
Pentair Südmo enters China’s pharma market

Delivery of this landmark project for Pentair Südmo will be through a team effort between Pentair Südmo in Germany, Pentair Water Purification Systems in Beijing and selected local partner companies.

“As with all projects, we strive to provide the most professional, highest quality and leading technological service,” said Friedrich Elz, Business Unit Manager Pharma-Dairy-Food at Pentair Südmo. “Pentair Südmo is a well respected, global player in the pharmaceutical sector but provides a local presence and understanding. We are dedicated to increasing the efficiency and performance of our customers’ operations in a most cost effective way.”

The design phase for this project is well underway and on-site activities are set to begin in the spring of 2011.

This is the first of at least seven workshops planned for construction on the site. Beijing Shiqiao Bio-Medicine Manufacturing wants the first workshop to set an example as providing the highest quality production process available to manufacture premium amino acid infusion products that conform to US FDA, China GMP and European Pharmacopeia standards. This will help open the door for potential export opportunities.

Pentair Südmo was successful in winning the order against stiff competition from both local and international companies. The project includes the design, delivery, building and validating of a fully automatic, aseptic process system. A feature of the system is Pentair Südmo’s latest generation of SVP Single Seat valves with P3 diaphragm and PEEK valve seal for superior performance during aseptic processing. The full scope of the project includes preparation vessels, transfer systems, powder addition and blending, sterile filtration, and clean-in-place (CIP) and sterilization-in-place (SIP) systems. In addition, Pentair Südmo is the overall general consultant for the complete amino acid workshop construction and will design, deliver and build all peripheral utilities for both clean and non-clean applications. These include water for injection and purified water storage, and distribution circuits.
Containerized pump rooms for projects in Romania and Venezuela

INGE SLUIJTER \ PENTAIR NIJHUIS SUPPLIED THE ENGINEERING, PROCUREMENT AND CONSTRUCTION CONTRACTOR (EPCC) FERROSTAAL WITH COMPLETE CONTAINERIZED FIREFIGHTING PUMP ROOMS FOR PROJECTS IN ROMANIA AND VENEZUELA. THE COMPACT AND TESTED MODULAR DESIGN OF THE PUMP ROOMS PROVIDES A VERY EFFICIENT SOLUTION, SUCH A COMPLETE SUPPLY CONSIDERABLY REDUCES THE RISK OF ASSEMBLY ERRORS AND SAVES CONSTRUCTION TIME ON SITE. FERROSTAAL, AN ORGANIZATION WITH 60 OFFICES WORLDWIDE, RECOGNIZED THESE IMPORTANT ADVANTAGES.

Firefighting pump room protects gas and oil plant

“One pump room was installed for the end customer OMV Petrom S.A. at its new gas compressor station in Bulbuceni, Romania,” said Niels van den Hurk, Pentair Nijhuis’ area sales manager. “Petrom is the largest corporation in Romania and the largest gas and oil producer in Eastern Europe. From Bulbuceni, Petrom provides compressed gas to the national gas network.”

The pump room in Bulbuceni needed to meet Petrom’s safety requirements and strict sound reduction demands to protect personnel and the work area. Since the equipment is tested weekly, part of meeting these guidelines included insulating the pump room so that the sound level from one meter measures less than 85 dBA.

In addition to the customer’s requirements, a number of extreme conditions that are decisive factors for selecting the proper diesel engine were taken into account for the pump room design. These conditions are: the site is located at 208 meters (682 feet) above sea level, the surroundings temperature varies between minus 29 and 40 degrees Celsius (minus 20 and 104 degrees Fahrenheit) and the average relative humidity is 63 percent. The pump room, consisting of four pumps and two jockey pumps — that serve to maintain water pressure in the sprinkler system — provides the complete water supply for fire protection at this location.

“The pump room was designed according to the latest directives of the National Fire Protection Association’s (NFPA) international standard NFPA-20,” van den Hurk said. “Besides that I am proud to say that we were able to meet all extra requirements, even though the conditions were challenging.”

New power plant in Venezuela protected against fire

“The EPCC of this project, Ferrostaal, initially contacted Pentair Nijhuis to supply separate firefighting pumps at the location in Bachaquero,” van den Hurk said. “But, considering the remote location, they chose the containerized pump room option, and thus profit from the advantages of this solution.”

The pump room contains two firefighting pumps, one diesel driven, one electric driven pump, and one jockey pump. All pumps comply with the latest regulations of NFPA-20, and are Factory Mutual (FM) approved. In addition, extra devices, supplied by the customer, were successfully incorporated into the total containerized concept.

“Constructing containerized units requires expertise that is available within Pentair Nijhuis,” van den Hurk said. “The firefighting equipment at both Petrom and Enelven well prepares both locations in the event of a fire. Studies have shown that when such units are in place, fire damage will be restricted to less than 10 percent, thus providing lower costs and less environmental impact.”
In February, the biogas upgrading installation in Witteveen, the Netherlands exceeded the milestone of producing and feeding 250,000 Nm³ biomethane into the gas grid. This is enough to foresee some 160 households with their annual consumption.

This biogas upgrading plant is the first of its kind. Pentair Haffmans installed the plant at Bouwhuis Biovergisting BV in Witteveen in November 2010. Bouwhuis is an agricultural company that produces biogas from corn.

The company expanded the capacity of its two running combined heat and power (CHP) installations. The additional 350 Nm³/h biogas are upgraded by Pentair Haffmans into 215 Nm³/h biomethane and 250 kg/h purified carbon dioxide (CO₂).

“It is a great step for Pentair Haffmans and fits perfectly into the shift towards renewable energy sources,” said Olaf Müller, Managing Director Pentair Haffmans, Head of Beverage and Niche Markets - Pentair Clean Process Technologies. “The energy targets of the European Union state that in 2020 20 percent of the energy used should come from alternative energy sources.”

Biogas is a general term for gas produced through an anaerobic fermentation process and primarily consists of a mixture of methane (CH₄) and CO₂. The upgrading technology recovers 100 percent of the CH₄ and causes no CH₄ losses. In the process the biogas is first cleaned by a Norit activated carbon filter and then the cleaned biogas flows through a membrane installation and a CO₂ recovery system.

The biomethane produced by the upgrading system has the same specifications as natural gas and has been accepted by Enexis for injecting it into the national gas grid. Enexis is responsible for the development, construction, maintenance and management of the gas and energy distribution network. As such the company is the link between 2.6 million customers and the energy suppliers.

The recovered CO₂ has a high purity and can be used as CO₂ gas in greenhouses or liquefied and stored for use in the food and beverage industries.

Pentair Nijhuis part of Dutch pilot group implementing ISO 26000

ISO 26000 is a guidance standard and is not for certification. It offers structure to organizations for implementing SR. The directive concerns 12 core subjects including organizational governance, environment, fair operating practices, community involvement, human rights, labor issues, and consumer/customer issues.

“NEN is soon publishing a book with practical experiences of ISO 26000 champions, and Pentair Nijhuis is one of them,” Schuuring added. “Together with nine other companies, we were the first Dutch company to implement this directive. Our successes and learning points will help other companies with their corporate social responsibility challenges.”

Pentair Nijhuis is member of a pilot group of organizations that have started the implementation of this NEN directive. During the introduction seminar on December 9, practical experiences with the application of ISO 26000 in business and industry were presented. Pentair Nijhuis’ Managing Director Robert Schuuring was one of the speakers. “ISO 26000 is well suited to Pentair Nijhuis,” he said. “Our products represent quality, high efficiency and durability. We use ISO 26000 as a guide to integrate social responsibility into our values and practices.

We are taking an even more critical look at our purchase and production processes and the social environment. ISO 26000 presents a very good approach in doing so.”
Pentair X-Flow wins 2011 iF Product Design Award

PENTAIR X-FLOW’S AERIAL™ MBR MEGABLOCK, WAS HONORED BY THE INTERNATIONAL FORUM DESIGN (IF) FOR EXCELLENCE IN PRODUCT DESIGN. IN TOTAL, 2,756 PRODUCTS FROM 1,121 PARTICIPANTS COMPETED FOR THIS PRESTIGIOUS DESIGN AWARD. WINNING THE AWARD CONFIRMS THAT PENTAIR X-FLOW’S EXPERTISE IN COMBINING STATE-OF-ART TECHNOLOGY WITH APPEALING DESIGN FEATURES.

The iF Product Design Awards are prestigious awards that recognize manufacturers and designers of industrial products exhibiting superior design from around the world in a variety of categories. Selection criteria include the quality of design, functionality, degree of innovation, simplicity of operation, and environmental impact. The Pentair Megablock is used in municipal wastewater treatment.

Specifically it is the sludge separating component of large-scale Membrane BioReactor (MBR) systems. The compact membrane separation system within the Megablock produces crystal-clear, bacteria-free water from a biological wastewater treatment process that can be reused for a variety of purposes. In addition, the membranes are in a dry and clean environment making them quickly accessible without comprising the health and safety of plant workers.

iF praised the Megablock for its “Lego™-Style” modular design that allows for easy installation and system expansion. Its advanced component design improves fluid flow and aeration, resulting in unprecedented performance.

“The Efficient Performance Technology philosophy - our guiding principle in product development - led to the Megablock’s development,” said Rick Rosberg, Global Commercial Director of Pentair X-Flow. “A compact, modular design flows naturally from our ambition to do more with less.”