



PCI Membranes
Filtration Group®

PRODUCT OVERVIEW



FILTRATION & MEMBRANE SPECIALISTS

ABOUT US

In 1968 a joint venture was set up between Portals Ltd and the UK Atomic Energy Authority to develop Reverse Osmosis systems for the desalination of sea water. Two types of system were developed in parallel. The first system was based on bundles of rods coated on the outside with membrane, whereas the second system used that is known as the B1 tubular membrane system. Both systems proved unsuitable for desalination, but the tubular system proved to be well suited to applications involving feed solutions with high levels of suspended solids.

Originally known as Paterson Candy International (PCI) in 1986 we became the stand alone business known as PCI Membranes. Portals Ltd sold the PCI Membranes business to Thames Water in 1989 and in 1999 Thames Water acquired and integrated Memtech, a membrane business based in Swansea. PCI Membranes is now part of Filtration Group, the fastest growing and one of the largest filtration businesses in the world. We are global leaders in providing innovative filtration systems and solutions to more than 30 industries. Under Filtration Group ownership PCI Membranes has completed the strategic acquisition of Pentair's X-FLow Classic Membranes in 2019. PCI Membranes became the exclusive provider of this technology, expanding its already unique offering of process and separation solutions.

We are dedicated to making the world safer, healthier and more productive through environmentally conscious products and services that help our customers enhance their processes while maintaining their operating costs.

As a specialist filtration and separation company, specialising in custom built crossflow membrane filtration systems for liquid separation in the process industries, we have prided ourselves on making our own membranes from the outset. Our customers demand the best that our technical and engineering skills and experience have to offer. It is our ability to interrogate problems and provide comprehensive solutions, delivering consistently impressive results that sets us apart from our competitors.

INDUSTRIES WE SERVE

Over 50 years, we have built up an enviable reputation around our engineering capability, high quality products, reliability and solution led approach. Whereby today we can offer process solutions using Microfiltration, Ultrafiltration, Nanofiltration, and Reverse Osmosis technologies for a wide variety of applications including;

- Wastewater
- Chemical Industries
- MBR
- Pharmaceutical and Biotechnology
- Food & Beverage
- Drinking Water

APPLICATIONS

Applications where tubular membranes have been selected as the best process solution include:

- Wood pulp bleach wastewater separation
- Lignosulphonate fractionation
- Side-stream (external) membrane bioreactors (MBRs)
- Landfill leachate treatment
- Metal finishing wastewater separation
- Active Pharmaceutical Ingredient manufacture
- Manufacture of fine chemicals (various)
- Dairy applications (e.g. dairy concentration)
- Fruit juice clarification
- Drinking water treatment
- Textile dye processing (e.g. desalting)
- Textile process wastewater treatment/reuse
- Clean In Place (CIP) solution recovery
- Water / Product recovery
- Acid purification
- Process R & D (academic and industrial)

A WIDE RANGE OF TUBULAR MEMBRANES

Our range of over 29 tubular membranes offers solutions that are suitable for all these applications. The variety of materials employed provides a range of chemical compatibilities, with their exhaustive development delivering unmatched performance. The range also incorporates products with UK Drinking Water Inspectorate approval, proving their suitability for municipal applications.

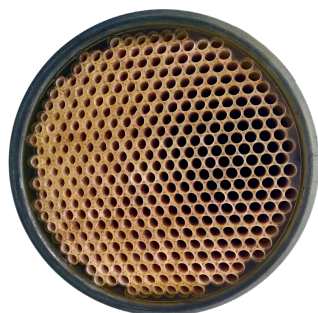
A SERIES

A5 SERIES



PCI Membranes compact A5 tubular ultrafiltration module can be used for a wide range of industrial applications in the process industry for the economic concentration and clarification of process liquids and wastewaters. The module comprises of a replaceable core of 69 tubes of 6mm diameter and uses PCI's robust PVDF membranes which are suited to a variety of different process conditions. Cores are fitted into PCI's proven stainless steel housings. The compact design gives the module a high strength allowing operating pressures of 10 bar. PCI's unique in-situ replaceable core enables fast, easy and cost effective remembraning.

A8 SERIES



The A8 tubular modules permit simple, rapid, high area and inexpensive tubular MF and UF membrane filtration for new and existing installations in the waste water industry. Modules are offered in two sizes (8" & 10") and two lengths (3m & 4m), each housing has 8mm in diameter membrane tubes, cast in epoxy resin at each end. Both lengths are designed for retrofitting to non-PCI systems and manufactured with materials approved by the FDA, CFR21 and EU regulations.

A19 SERIES



The A19 tubular UF system incorporates a robust, low-cost module in stainless steel, together with a choice of tubular membranes in various materials. The removable core design (RCM) permits simple, rapid, and inexpensive membrane replacement. Modules are offered in two lengths (3.05m & 3.66m), each housing 19 membranes, 12.5mm in diameter, cast in epoxy resin at each end. Both lengths are designed for retro-fitting to non-PCI systems. To ensure system integrity, on-line permeate sampling from individual modules is available. Manufactured with materials approved by the FDA, CFR21 and EU regulations. The compact design gives the module a high strength allowing operating pressures of 7 bar. PCI's unique in-situ replaceable core enables fast, easy and cost effective remembraning.

A37 SERIES



The A37 tubular UF system incorporates a robust, low-cost module in stainless steel, together with a choice of tubular membranes in various materials. The removable core design (RCM) permits simple, rapid, and inexpensive membrane replacement. The modules are 3.66m in length, housing 37 membranes, 12.5mm in diameter, cast in epoxy resin at each end. To ensure system integrity, permeate sampling from individual modules is available. Manufactured with materials approved by the FDA, CFR21 and EU regulations. The compact design gives the module a high strength allowing operating pressures of 7 bar. PCI's unique in-situ replaceable core enables fast, easy and cost effective remembraning.

B1 SERIES

B1 Series



The tubular B1 module provides the user with a robust, proven, ultra filtration, nanofiltration and reverse osmosis module and a wide range of fully interchangeable membrane elements. Each module, up to 3.6m long, comprises 18 perforated stainless steel tubes in the form of a shell and tube, each tube fitted with a membrane element. The shell, or shroud, is also fabricated from stainless steel and has outlets fitted for the permeate, the liquid that passes through the membrane. Manufactured with materials approved by the FDA, CFR21 and EU regulations.



B1 Series NF & RO modules, series flow (RO) arrangement

Each Reverse Osmosis module comprises 18 perforated stainless steel tubes in the form of a shell and tube, each tube fitted with a membrane element. Flow of the process fluid through each of the tubes is effected by specially designed end caps connecting all eighteen tubes in series. The open channel, highly turbulent flow design allows a wide variety of process liquors to be concentrated, with minimal pretreatment. High levels of suspended materials can be tolerated. The design is free of dead spaces, which reduces the fouling potential of the membranes while ensuring maximum effectiveness of cleaning in-situ procedures.



B1 Series Ultrafiltration modules, twin entry (UF) arrangement

Each ultrafiltration module comprises 18 perforated stainless steel tubes in the form of a shell and tube, each tube fitted with a membrane element. Flow of the process fluid through each of the tubes is effected by specially designed end caps providing 2 parallel channels, each of 9 tubes in series. This allows viscous materials to be processed and high cross flow velocities to be used with acceptable pressure drop. The open channel, highly turbulent flow design allows a wide variety of process liquors to be concentrated, with minimal pretreatment. High levels of suspended materials can be tolerated. The design is free of dead spaces, which reduces the fouling potential of the membranes while ensuring maximum effectiveness of clean-in-situ procedures.



B1 Series Ultrafiltration modules, parallel flow (UF) arrangement

Each module comprises 18 perforated stainless steel tubes in the form of a shell and tube, each tube fitted with a membrane element. Flow of the process fluid through each of the tubes is effected by specially designed end cap providing 18 parallel channels. This allows viscous materials to be processed and high cross flow velocities to be used with acceptable pressure drop. The open channel, highly turbulent flow design allows a wide variety of process liquors to be concentrated, with minimal pretreatment. High levels of suspended materials can be tolerated. The design is free of dead spaces, which reduces the fouling potential of the membranes while ensuring maximum effectiveness of cleaning-in-situ procedures.

C10 Series, evaluation & test modules



C10 Series ultrafiltration & nanofiltration modules

The C10 module, offers the user an economic tubular module which can be fitted with a dedicated range of proven nanofiltration and ultrafiltration membranes. The module, has been developed to improve the competitiveness of tubular membrane plants, especially at larger capacities. It can be operated at 12 bar at 20°C.



Micro 240&960 short term MF, UF, NF & RO evaluation modules

The MICRO 240 & 960 is designed for the economic, short term evaluation of membrane processes for separation and concentration at laboratory bench-scale. This inexpensive module may be fitted, by the user, with samples of any of PCI Membranes' wide range of tubular Microfiltration, Ultrafiltration, Nanofiltration or Reverse Osmosis membranes. Constructed in 316 stainless steel, the module has termination points allowing easy connection by flexible or welded couplings to existing equipment. Larger modules and ancillary components are available if required.



Classic Series membranes range

The Classic tubular membrane product are well suited to handle aqueous feeds with high levels of dry substances (up to 40,000 ppm), high viscosities, or high degrees of fouling. The PCI Classic membranes is available in a wide range of tubular Ultrafiltration and Reverse Osmosis membranes. Constructed in plastic modules and offered in three lengths (2m, 3m and 6m).

Pilot units



Pilot units - pilot scale production and processing

The unit is designed for pilot scale work and may be used to process a wide variety of aqueous solutions using Microfiltration (MF), Ultrafiltration (UF), Nanofiltration (NF) or Reverse Osmosis (RO). A wide range of membranes is available to suit the required application. Both designs are supplied with instrumentation necessary for scale up data to be collected accurately and easily. Customisation is available to allow use for small production requirements in continuous, semi continuous or batch operation.

Why Tubular Membranes?

Tubular Membranes

Tubular membranes are particularly suited to fluids with high viscosity and/or suspended solids, as their wide flow paths make them highly resistant to blocking. Pre-treatment requirements are minimal, and are often completely avoided – a benefit that makes membranes the most cost effective choice for many small systems.

Membrane Development

Our development chemists continuously refine product performance to expand our range, extending the benefits offer to users. Our in-house development and manufacturing capability enables us to provide customised membranes tailored for specific applications. This can prove highly beneficial where short process development times are the key. New developments include hydrophilic membranes for lower fouling, improved selectivity, increased solvent, acid and base resistance, improved flux and strengthened membrane supports.



Cleaning

The choice of cleaning chemicals and cleaning frequency depend upon the nature of the process and the membrane type. Acids, Alkalis and Detergents are used as required. Typical cleaning procedures are indicated on the Cleaning Procedure Manual. The C10 type applications can also be cleaned mechanically using an automated “pigging” process that uses foam balls and can significantly reduce the need for cleaning chemicals.

Spiral Wound Series

FG-SpiraCore Series



The FG-SpiraCore membrane elements are produced on high-tech advanced membrane production lines and are available as Microfiltration (MF), Ultrafiltration (UF), Nanofiltration (NF) and Reverse Osmosis (RO) in a variety of materials and specifications for choosing.

The main Advantages are High Flux and High Rejection as well High Temperature Resistant in various component forms. We specialise in Clarification, Decolorization, Desalination, Concentration (Protein, Sugar, Juice, Amino acids & Whey), Aseptic Filtration (MF), Separation of Mono and Disaccharides, High Temperature Heat Sterilizing (Food & Sanitary Water).

Hollow Fibre Series



PCI HF-mbr Series

Reinforced submerged PCI-HF-mbr membranes operate Outside-to-in and separate purified effluent from waste water biomass compounds in the dead-end filtration mode. The PCI-HF-mbr modules are offered in two size U and S and two type of cassettes with standard aeration PCI-HF-Gmbr and low energy PCI-HF-Zmbr. Each of the membrane fibre has Pore size 0.02 micron and Max operation pressure -0.6 bar.



The intensive nature of the biological treatment stage combined with the filtration barrier provided by the membrane stage makes the system robust and surprisingly simple to operate, enabling the process to tolerate considerable fluctuations in influent quality. A very high quality of effluent is produced that is suitable for on-site reuse or direct discharge to sensitive receiving waters. It is also highly suited to polishing processes, such as PCI Membranes' range of Reverse Osmosis systems, which can purify water to almost any standard required. Systems can be provided either as standard packages or bespoke designs to suit the nature of the wastewater and integration into existing site infrastructure.

OUR COMMITMENT TO QUALITY

PCI Membranes is committed to providing filtration products that deliver exemplary value and dedicated service that consistently delights our customers. We work to accomplish this with ongoing improvements across our business practices and with diligent adherence to our Quality Management System.

Quality Assurance – Proven Membranes

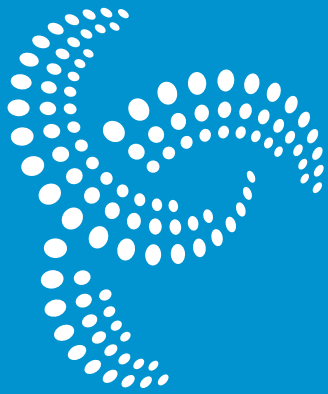
PCI Membranes designs, manufactures and provides supply and servicing of equipment for liquid separation to the quality standard: ISO 9001:2015.

Testing and traceability

Destructive testing is carried out on samples of every membrane batch, as well as performance testing of all RO and NF membranes. Finished membranes are preserved and stored under carefully-controlled conditions to prevent deterioration during storage. A computerised records and coding system provides for complete traceability of each membrane produced and facilitates traceability to confirm that the membranes meet PCI Membranes high quality standards.

Guarantees

PCI Membranes' products are offered with guarantees commensurate with their application and conditions of use. Additionally our experience of delivering membrane solutions allows us to provide extensive process performance guarantees when offering complete systems.



PCI Membranes

Filtration Group®

Making the World Safer, Healthier & More Productive



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