VONTRON TECHNOLOGY CO.,LTD

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Essential is water to life
Vontron presents inexhaustible supply

VONTRON®

VONTRON

Essential is water to life
Vontron presents inexhaustible supply

VISION

Upgrade our value upon the top quality and strive to become the professional leader in the world

MISSION

Broaden the new sources of supply and reduce the consumption so as to bloom the water industry

VALUE

Advocate the science and keep in pursuit for excellence

PRESIDENT'S ADDRESS

Evolved from “Vontron Enviro-Tech” via “Vontron Membrane Technology”, Vontron Technology Co., Ltd. has grown up through the past years. By virtue of innovation and advancement, we have survived the intensively competing market where only the fittest and the excellent can survive. We are contained in this ecological system, and in return make contributions to this system. We’ve successfully merged the individual value in the corporate vale, and merged the corporate value in the social value. We are wholeheartedly grateful to our valuable customers for their unswerving support in the past years.

We will be, as always, making relentless efforts to contribute our value to the society in the coming era. We are always following the corporate philosophy of “surpassing ourselves and Keeping in endless pursuit”, and are making our best efforts to demonstrate the spirits of tenacity, wisdom and innovation.

We are always treating the world with a thanksgiving heart since we are bestowed with the blooming life.

蔡志奇

COMPANY PROFILE

Vontron Technology Co., Ltd. is specialized in R&D, manufacture and technical service of RO and NF membrane elements. Owning the core technology and capability for fabrication of membrane sheet, Vontron is the biggest professional manufacturer of compound RO membranes in China, and is the provider of system design and applied service with powerful technical support. Vontron owns and operates its producing plant in Guiyang, amounting to a total yearly capacity of 10 million square meters of RO/NF membrane sheets.

Vontron Technology Co., Ltd. will be, as always, carrying out the corporate spirit of "Surmounting Ourselves and Keeping in Endless Pursuit", and will devote itself to becoming one of the worldwide top suppliers in the membrane industry with large scale, top quality, highest level technology, complete product directory and best service.

COMPANY MEMORABILIA

December 2000

December 2000: Vontron Enviro-Tech Co., Ltd. was established and duly registered

July 2001

The Company imported from the United States a complete set of equipment and technology for composite RO membrane production.

February 22, 2002

The producing technology and equipment for RO membranes imported from abroad passed the Appraisal of New Technical Achievements organized by the Science & Technology Department of Guizhou Province.

The year of 2003

VONTRON's membrane products entered the market.

November 25, 2003

the company was certified to ISO9001:2000 Quality Control System of China Quality Certification Center.

From November 9 to November 11, 2006

Vontron succeeded in organizing the "All-China RO Membrane Domesticization Forum 2005" held in Guiyang, China.

2000 years
2001 years
2002 years
2003 years
2004 years
2005 years
2006 years
2007 years
2008 years
2009 years
2010 years
2011 years
2012 years

January 10, 2006

VONTRON's residential RO membranes were Certified to NSF/ANSI 58.

June 2006

Zhuzhou Electric Locomotive Research Institute (Zhuzhou CSR Times Electric Co., Ltd) became a shareholder of the Vontron, and the company was then renamed to "Vontron Membrane Technology CO., Ltd."

July 2007

Vontron Technology Co., Ltd. was established and registered in Beijing, and then completed the buyout of Vontron Membrane Technology Co., Ltd.

November 2011

Vontron's membrane products were certified to WQA Gold Seal

CERTIFICATION

Vontron was certified to ISO9001 in November 2011

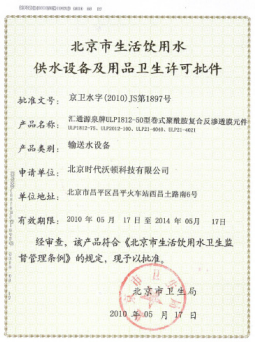
Vontron was certified to NSF-58 in January 2006

Vontron passed the sanitation inspection held by Center of Disease Control of China in June 2006

Vontron was certified to WQA Gold Seal in November 2011

GOVERNMENTAL APPROVAL

Vontron obtained the Health Approval issued by the Department of Health of Beijing on May 2010



北京市生活饮用水
供水设备及用品卫生许可批件

批准文号：京卫水字(2010)JS第1897号
产品名称：汇通超滤膜牌ULP1812-50型卷式聚酰胺复合反渗透膜元件
产品类别：输送水设备
申请单位：北京时代沃顿科技有限公司
单位地址：北京市昌平区昌平火车站西昌土路南6号
有效期限：2010 年 05 月 17 日至 2014 年 05月 17日
经审查，该产品符合《北京市生活饮用水卫生监督管理条例》的规定，现予以批准。
北京市卫生局
2010 年 05 月 17 日

PRODUCTS

Catalog of Residential Elements and Non-standard Elements

Type	Model	Stable Rejection(%)	Average Permeate GPD (m^3/d)	Working Pressure & Application Fields	Testing Conditions		
					Testing Pressure psi(MPa)	Testing Solution ConcentrationNaCl(ppm)	Recovery (%)
Regular Residential Elements	ULP1810-40	97.0	40 (0.15)				
	ULP1812-50	97.5	50 (0.19)	Working under extremely low pressure. Applicable to residential water purifier and water purifying devices in hospital and laboratory for treatment of feedwater with TDS lower than 500 ppm.	60 (0.41)	250	15
	ULP1812-75	97.5	75 (0.28)				
	ULP2012-100	95.0	100 (0.38)				
Residential Oxidation-resistant Elements	HOR2012	97.5	50 (0.19)	Applicable to water sources with oxidizing substance or high microbial pollution.	60 (0.41)	250	15
Non-standard Elements	ULP2812	97.0	200 (0.76)	Working under extremely low pressure. Applicable to automatic water dispenser and residential drinking fountain.	100 (0.69)	500	15
	ULP3012	97.0	240 (0.91)				
	ULP3020	97.0	420 (1.60)				

Product Catalog

Catalog of Industrial Membrane Elements

Type	Model	Stable Rejection(%)	Average Permeate GPD (m^3/d)	Working Pressure & Application Fields	Testing Conditions		
					Testing Pressure psi(MPa)	Testing Solution ConcentrationNaCl (ppm)	Recovery (%)
General-purpose Industrial Membranes	LP21-8040	99.5	9600 (36.3)	Working under low pressure. Applicable to regular or high content brackish water.	225 (1.55)	2000	15
	LP22-8040	99.5	10500 (39.7)				
	LP21-4040	99.5	2400 (9.1)				
	XLP11-4040	98.0	2000 (7.6)	Working under extremely low pressure. Applicable to feedwater with low salinity that requires low rejection rate.	100 (0.69)	500	15
	ULP21-8040	99.0	11000 (41.6)	Working under ultra low pressure. Applicable to feedwater with fairly low salinity.	150 (1.03)	1500	15
	ULP12-8040	98.0	13200 (49.9)				
	ULP22-8040	99.0	12100 (45.7)				
	ULP32-8040	99.5	10500 (39.7)				
	ULP11-4040	98.0	2700 (10.2)				
	ULP21-4040	99.0	2400 (9.1)				
	ULP31-4040	99.4	1900 (7.2)				
	ULP11-4021	98.0	1000 (3.78)	Working under ultra low pressure. Applicable to commercial water purifier, and water purifying devices for hospital and laboratory.	150 (1.03)	1500	8
	ULP21-4021	99.0	950 (3.6)				
	ULP31-4021	99.4	850 (3.2)				
	ULP21-2521	99.0	300 (1.13)				
	ULP21-2540	99.0	750 (2.84)				15
Seawater Desalination Membranes	SW21-8040	99.7	5000 (18.9)	Working under high pressure. Applicable to seawater or quasi seawater.	800 (5.5)	32800	8
	SW22-8040	99.7	6000 (22.7)				
	SW21-4040	99.5	1400 (5.3)				
	SW11-2540	99.2	500 (1.89)	Working under high pressure. Applicable to small-sized system in military ship, marine ship, laboratory, etc. for desalination of seawater or high-content brackish water.			
	SW11-4021	99.2	750 (2.8)				4
	SW11-2521	99.2	200 (0.76)				
Fouling Resistant Membranes	FR11-8040	99.5	9600 (36.3)	Working under low pressure. Applicable to feedwater with small content of contaminants (organic substances, colloids).	225 (1.55)	2000	15
	PURO-I	99.5	10500(39.7)				
	FR11-4040	99.5	2200 (8.3)				
High Oxidation Resistant Membranes	HOR21-8040	99.2	9000	Applicable to feedwater with oxidative substances or serious microbial contamination.	225 (1.55)	2000	15
	HOR21-4040	99.2	2200				

Catalog of Nanofiltration Membranes

Type	Model	Stable Rejection(%)	Average Permeate GPD (m^3/d)	Working Pressure & Application Fields	Testing Conditions		
					Testing Pressure psi(MPa)	Testing Solution Concentration	Recovery (%)
Residential NF Elements	VNF1-1812	30~50	60(0.22)	Working under extremely low pressure. Applicable to various home-drinking purifiers, mineralizing drinking machine, etc.	30 psi (0.2Mpa)	250 ppm (NaCl)	15%
		>60			30 psi (0.2Mpa)	250 ppm ($CaCl_2$)	15%
	VNF2-1812	50~70	50(0.19)		30 psi (0.2Mpa)	250 ppm (NaCl)	15%
		>80			30 psi (0.2Mpa)	250 ppm ($CaCl_2$)	15%
	VNF1-2012	30~50	100(0.38)		30 psi (0.2Mpa)	250 ppm (NaCl)	15%
		>60			30 psi (0.2Mpa)	250 ppm ($CaCl_2$)	15%
	VNF2-2012	50~70	85(0.32)		30 psi (0.2Mpa)	250 ppm (NaCl)	15%
		>80			30 psi (0.2Mpa)	250 ppm ($CaCl_2$)	15%
Industrial NF Elements	VNF1-8040	40~60	12000(45.5)	Working under extremely low pressure. Applicable to production of drinking water and in separation and concentration/ purification processes for foodstuff, medicine, biological engineering and pollution treatment, etc.	70 psi (0.5Mpa)	2000ppm (NaCl)	15%
		>96	10000(37.5)		70 psi (0.5Mpa)	2000ppm ($MgSO_4$)	15%
	VNF2-8040	80~95	7500(28.4)		70 psi (0.5Mpa)	2000ppm (NaCl)	15%
		>96	9000(33.9)		70 psi (0.5Mpa)	2000ppm ($MgSO_4$)	15%
	VNF1-4040	40~60	2400(9.1)		70 psi (0.5Mpa)	2000ppm (NaCl)	15%
		>96	2000(7.5)		70 psi (0.5Mpa)	2000ppm ($MgSO_4$)	15%
	VNF2-4040	80~95	1400(5.3)		70 psi (0.5Mpa)	2000ppm (NaCl)	15%
		>96	1800(6.8)		70 psi (0.5Mpa)	2000ppm ($MgSO_4$)	15%
	VNF1-2540	40~60	800(3.03)		70 psi (0.5Mpa)	2000ppm (NaCl)	15%
		>96	650(2.46)		70 psi (0.5Mpa)	2000ppm ($MgSO_4$)	15%
	VNF2-2540	80~95	525(1.98)		70 psi (0.5Mpa)	2000ppm (NaCl)	15%
		>96	600(2.27)		70 psi (0.5Mpa)	2000ppm ($MgSO_4$)	15%

Variety of Membrane Products

General-purpose Industrial Membranes

Low Pressure Element – LP Series

Suitable for desalting surface water, underground water, tap water and municipal water, etc. with salinity under 10000ppm.

Ultra Low Pressure Element – ULP Series

Suitable for desalting those water sources with salt concentration lower than 2000 ppm, such as surface water, underground water, tap water and municipal water, etc

Extra Low Pressure Element – XLP Series

Suitable for desalting those water sources with low salinity while not requiring high salt rejection, with salt concentration lower than 1000 ppm

Seawater Desalination Membranes

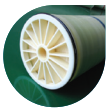
Seawater Desalination Element – SW Series

Applicable to treatment of seawater and high-concentration brackish water

Fouling Resistant Membranes

Fouling Resistant Element – FR Series

The FR series is suitable for wastewater reclamation application and treatment of high-polluted water sources thanks to its strengthened anti-scaling performance and higher resistance to organic and microbial fouling which can decrease the fouling speed and extend the service life of membrane element.



High Oxidation Resistant Membranes

HOR Series

The HOR series has the excellent properties that can remain basically unchanged through continuous impact of 1880ppm oxidative matters for 30 hours. It can endure a transient oxidative impact of NaClO at 26000ppm•h while the rejection rate remains above 98%.

Residential RO Element

Residential Membrane Element

The 1812-sized and 2012-sized residential membrane elements are mainly applicable to various small-sized systems, such as household water purifier and other water purifying devices in hospital and laboratory.

Nanofiltration Membranes

Nanofiltration membranes are designed for removing from water various organics, microbes, viruses and most metallic ions with two or higher valence while retaining part of the sodium, potassium, calcium and magnesium ions, etc.

Residential NF Element

The 1812-sized and 2012-sized NF elements are applicable to various small-sized drinking systems, such as home drinking water purifiers, mineralized drinking fountain, etc.

Industrial NF Element

The industrial NF membranes are used in:

- Treatment of drinking water
- Separation and concentration/purification process for foodstuff, medicine, biological engineering and pollution treatment, etc.

Application Fields

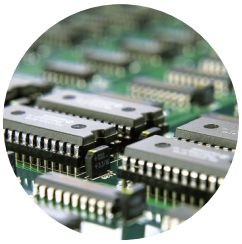
Power Industry

Chemical Industry

Metallurgical Industry

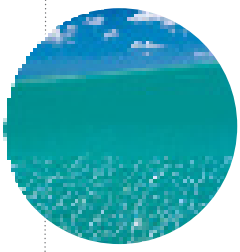
Foodstuff and Beverage

Pharmaceutical Industry



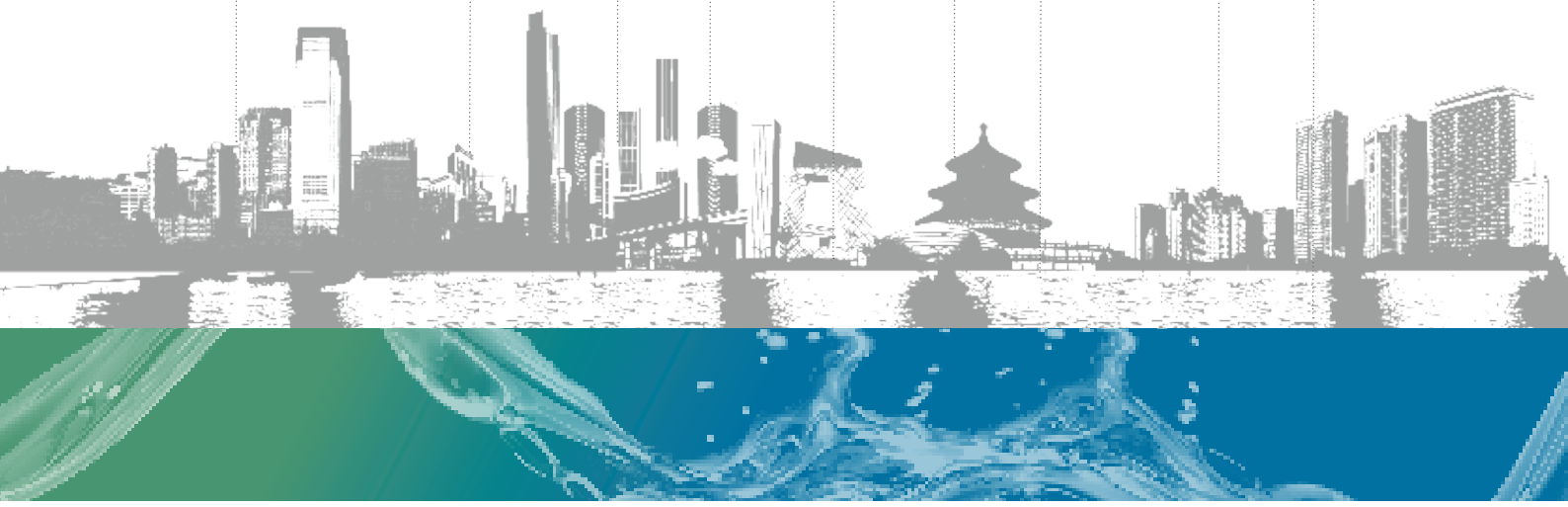
Electronic Industry

Water Treatment



Seawater Desalination

Drinking Water



Low Pressure Element – LP Series

Production Introduction

The LP (low pressure) series of aromatic polyamide compound membrane element developed by Vontron Technology Co., Ltd. has the properties of low-pressure operation, high permeate flow and excellent desalination and are applicable to desalination of brackish water. Besides, it is particularly applicable to fabrication of high-purity water for electronic industry and electric power industry owing to its excellent performance in removing soluble salts, TOC, SiO_2, etc.

Being suitable for desalting such water sources as surface water, underground water, tap water and municipal water, etc., LP series is mainly applicable to treatment of various industrial water such as industrial-purpose pure water, boiler water replenishment in power plant, and can be also applied to such brackish water applications as treatment of high-concentrated saline wastewater and production of beverage-purpose water.

Specifications and Major Properties

Model	Active Membrane Area $ft^2(m^2)$	Average Permeated Flow GPD(m^3/d)	Stable Rejection Rate (%)	Minimum Rejection Rate (%)
LP21-8040	365(33.9)	9600(36.3)	99.5	99.3
LP22-8040	400(37.0)	10500(39.7)	99.5	99.3
LP21-4040	90(8.4)	2400(9.1)	99.5	99.3

Testing Conditions

Testing Pressure..... 225psi (1.55Mpa)
Testing Solution Temperature.....25℃
Testing Solution Concentration (NaCl)..... 2000ppm
pH Value of Testing Solution 7.5
Single Element Recovery.....15%

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Seawater Desalination Element – SW Series

Testing Conditions

Testing Pressure……800psi (5.5Mpa)
Testing Solution Temperature……25℃
Testing Solution Concentration (NaCl) ……32800ppm
pH Value of Testing Solution……7.5
Single Element Recovery……8%(8040/4040/2540)
4%(4021/2521)

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Product Introduction

SW series of aromatic polyamide compound membrane element developed by Vontron Technology Co., Ltd. is applicable to desalination of seawater. By optimizing the structure of membrane element, the SW series increases the permeate flow, and requires fewer elements for same permeate flow. It is characterized by low operating pressure, low investment in equipment, excellent rejection rate and reliable performance, and its high salt rejection can ensure producing the drinking water from seawater simply through one-pass RO design.

Applicable to treatment of seawater and high-concentration brackish water, the SW series of membrane element is designed for various industrial water treatment, such as seawater desalination, high-concentration brackish water desalting, boiler water replenishment for power plant, etc., and is also applicable to various fields such as recycling of wastewater, concentration and reclamation of such substances with high additional value as foodstuff, pharmaceuticals, etc.

Specifications and Major Properties

Model	Active Membrane Area $ft^2(m^2)$	Average Permeated Flow GPD(m^3/d)	Stable Rejection Rate (%)	Minimum Rejection Rate (%)
SW21-8040	330(30.6)	5000(18.9)	99.7	99.5
SW22-8040	380(35.2)	6000(22.7)	99.7	99.5
SW21-4040	85(7.9)	1400(5.3)	99.5	99.2
SW11-4021	33(3.1)	750(2.8)	99.2	99.0
SW11-2521	12(1.1)	200(0.76)	99.2	99.0
SW11-2540	28(2.6)	500(1.89)	99.2	99.0

Fouling Resistant Element – FR Series

Testing Conditions

Testing Pressure..... 225psi (1.55Mpa)
Testing Solution Temperature..... 25°C
Testing Solution Concentration (NaCl).....2000ppm
pH Value of Testing Solution..... 7.5
Single Element Recovery.....15%

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Production Introduction

Vontron's fouling resistant elements include FR series and PURO series.

FR (fouling resistant) series of aromatic polyamide RO membrane element developed by Vontron Technology Co., Ltd. is applicable to desalination of brackish water. It is characterized by low-pressure operation, higher water productivity and excellent desalting performance. Moreover, special treatment has been made to the surface of membrane with unique technology to change its electrical charge and smoothness, increasing the hydrophilicity of membrane surface, thus decreasing the adhesion of contamination and microbe so as to lessen the pollution and extend the service life of elements.

Newly developed by Vontron, the PURO-I is specially designed for treatment of water reclamation and surface water treatment where the water source contains high contamination. This brand-new element contains a new fouling resistant coating, and the membrane surface is treated with special technology to modify the electrical charge and smoothness of membrane surface so as to increasing the hydrophilicity of membrane surface, thus decreasing the adhesion of contamination and microbe so as to lessen the pollution and extend the service life of elements. Besides, the wider 34mil feed spacer channel can provide better fouling resistance and washability.

Vontron's fouling resistant products are designed for desalting treatment of such water with salt concentration less than 10,000 ppm as surface water, underground water, tap water and municipal water, etc. It is mainly applied to treatment of various industrial water applications, such as reuse of industrial reclaimed water and boiler water replenishment for power plant, etc., and is particularly applicable to treatment of those water containing slight organic pollutants such as industrial wastewater, municipal sewage and other slightly contaminated water.

Specifications and Major Properties

Model	Active Membrane Area $ft^2(m^2)$	Average Permeated Flow GPD(m^3/d)	Stable Rejection Rate (%)	Minimum Rejection Rate (%)
FR11-8040	365(33.9)	9600(36.3)	99.5	99.3
PURO-I	400(37.0)	10500(39.7)	99.5	99.3
FR11-4040	90(8.4)	2200(8.3)	99.5	99.3

High Oxidation Resistant Element - HOR Series

Production Introduction

HOR (high oxidation resistant) series of aromatic polyamide compound membrane element newly developed by Vontron Technology Co., Ltd. has the properties of low operating pressure, high permeate flow and excellent rejection performance, etc. Besides, the use of special synthesizing process enhances the oxidation property of membrane element and enables the membrane element to endure the impact by certain magnitude of oxidative substance, thus simplifying and optimizing the pretreatment process of RO system, decreasing the microbial contamination of membrane element, saving the operating cost and elongating the service life.

Industrial HOR series is designed for the desalting treatment of those water sources with salinity lower than 10000ppm such as surface water, underground water, tap water and municipal water, etc., and is especially applicable to reuse treatment of those water sources that contain microbial contamination or oxidative substance, such as municipal-purpose or industrial-purpose reclaimed water, electroplating wastewater, etc. The residential HOR-2012 element is mainly applied to various miniature systems such as household water purifier, water purifying devices for hospital and laboratory, etc.

Specifications and Major Properties

Model	Active Membrane Area $ft^2(m^2)$	Average Permeated Flow GPD(m^3/d)	Stable Rejection Rate (%)	Minimum Rejection Rate (%)
HOR21-8040	365(33.9)	9000(34.1)	99.2	99.0
HOR21-4040	90(8.4)	2200(8.3)	99.2	99.0

Testing Conditions

Testing Pressure..... 225psi (1.55Mpa) (8040/4040)
Testing Solution Temperature..... 25℃
Testing Solution Concentration (NaCl)..... 2000ppm (8040/4040)
pH Value of Testing Solution..... 7.5
Single Element Recovery..... 15%

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Nanofiltration Membranes – Residential Element

Production Introduction

Applicable to various small-sized drinking systems, such as home drinking water purifiers, mineralized drinking fountain, etc., the residential 1812-type and 2012-type NF elements are designed for removing from water various organics, microbes, viruses and most metallic ions with two or higher valence while retaining part of the sodium, potassium, calcium and magnesium ions, etc., thus improving the mouthfeel of purified water and maintaining the content of mineral nutrition.

VNF1	Moderate rejection rate; Moderate passage of calcium;
VNF2	Higher rejection of calcium

Specifications and Major Properties

Model	Active Membrane Area ft2 (m2)	Solution Type	Average Permeate GPD (m3/d)	Stable Rejection (%)
VNF1-1812	4.4(0.41)	NaCl	60(0.22)	30~50
		$CaCl_2$		>60
VNF2-1812	4.4(0.41)	NaCl	50(0.19)	50~70
		$CaCl_2$		>80
VNF1-2012	5.0(0.46)	NaCl	100(0.38)	30~50
		$CaCl_2$		>60
VNF2-2012	5.0(0.46)	NaCl	85(0.32)	50~70
		$CaCl_2$		>80

Notes: The permeate flow of single membrane element vary within (-15%) ~ (+25%)

Testing Conditions

Testing Pressure ..... 30 psi (0.2Mpa)
Temperature of Testing Solution..... 25°C
Concentration of Solution (NaCl)..... 250ppm
Concentration of Solution (MgSO4) 250ppm
pH Value of Solution 7.5
Single Element Recovery 15%

VONTRON

Nanofiltration Membranes – Industrial-purpose Element

Production Introduction

The industrial nanofiltration element is designed for removing from water various organics, microbes, viruses and most metallic ions with two or higher valence while retaining part of the sodium, potassium, calcium and magnesium ions, etc. Nanofiltration, free of chemical reaction, heating and transformation, can keep the biological activity undamaged and maintain the primary flavor or fragrance of substance unchanged, and is increasingly applied in production of drinking water and in separation and concentration/purification processes for foodstuff, medicine, biological engineering and pollution treatment, etc.

VNF1	Moderate rejection rate; Moderate passage of calcium; High removal of TOC
VNF2	Higher rejection rate; Satisfactory removal of insecticide, herbicide, TOC and transition metals

Testing Conditions

Testing Pressure ……70 psi (0.5Mpa)
Temperature of Testing Solution……25℃
Concentration of Solution (NaCl) …… 2000ppm
Concentration of Solution (MgSO4) … 2000ppm
pH Value of Solution……7.5
Single Element Recovery…… 15%

VONTRON

Specifications and Major Properties

Model	Active Membrane Area $ft^2(m^2)$	Solution Type	Average Permeate GPD(m^3/d)	Stable Rejection(%)
VNF1-8040	400(37.2)	NaCl	12000(45.5)	40~60
		$MgSO_4$	10000(37.5)	>96
VNF2-8040	400(37.2)	NaCl	7500(28.4)	80~95
		$MgSO_4$	9000(33.9)	>96
VNF1-4040	80(7.4)	NaCl	2400(9.1)	40~60
		$MgSO_4$	2000(7.5)	>96
VNF2-4040	80(7.4)	NaCl	1400(5.3)	80~95
		$MgSO_4$	1800(6.8)	>96
VNF1-2540	28(2.6)	NaCl	800(3.03)	40~60
		$MgSO_4$	650(2.46)	>96
VNF2-2540	28(2.6)	NaCl	525(1.98)	80~95
		$MgSO_4$	600(2.27)	>96

Notes: Minimum rejection of MgSO4 is 94%. The permeate flow of single element may vary within ±25%.

R&D

R & D TEAM

Vontron Technology Co., Ltd. owns an R&D team consisting of experts and engineers with senior educational background, among whom more than 60% have the degree of master, and more than 20% have a doctoral degree.

The R&D Center is devoted to research and development of membrane separation materials, module structure and system application, and has obtained certain achievements in the fields of membrane materials, membrane manufacturing technology and membrane manufacturing equipment.

R&D CAPABILITY

Vontron's R&D Center owns a well-equipped membrane laboratory and a team of experts who, having been engaged in water treatment for many years and having rich experience in practice, are capable of autonomously developing the compound RO membranes widely applicable to the field of water treatment and providing better solutions of system design. By virtue of its solid technical strength, it can ensure the powerful technical support to the customers along with the expansion and extension of product category.

After its establishment, the R&D Center has been focused on overall improving its capability in technical innovation, optimizing the resource allocation for technical innovation and improving the efficiency of technical innovation so as to enhance the competitive power and development impetus of the company.

Key R&D Projects

- State's Key New Product Project: Low-Pressure Compound RO Membrane LP21-8040
- State's Key New Product Project: Energy-saving RO Membrane Element 1812-Sized
- National 863 Project: Experiment and Research of the Application of Compound RO Membrane to Seawater Desalination
- National 863 Project: Development of Key Materials for Energy-Saving Low-Pressure RO Membrane
- National 863 Project: Key Technology on Large Scale Manufacture of High-performance Separating Materials

Acquisition of Patents

As of October 2012, totally 32 patents have been authorized to Vontron, of which 13 items are patented for invention (including 1 patent authorized in Korea) and 19 items for utility model.

Some of the authorized patents include:

1. Patent for Invention: An Oxidation-resistant Composite Reverse Osmosis Membrane; China; [200610051219.X]
2. Patent for Invention: A Method for Production Fouling Resistant Composite Reverse Osmosis Membrane; China; [200610051205.8]
3. Patent for Invention: A Method for Production of Extremely Low Pressure Composite Reverse Osmosis Membrane; China; [200610051192.4]
4. Patent for Invention: An Oxidation-resistant Composite Reverse Osmosis Membrane; Korea; [10-2008-0018854]

Besides, some 20 patents have been submitted, preliminary examined or publicized in USA, Europe, Japan, Hong Kong, Taiwan and PCT, etc.

Design and Research Capability
Inspection and Testing Capability
Process Control Capability
Applied Research and Service Capability

VONTRON

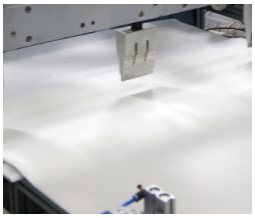


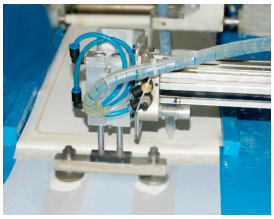

MANUFACTURING

Professional
Manufacture Equipment and Capacity

Vontron owns the core technology for fabricating of membrane sheets, with annual capacity of 10 million square meters of reverse osmosis and nanofiltration membrane sheet.

Besides continuously improving the technological process and formula technology, Vontron has also been reasonably and feasibly conducting technical upgrading and renewal of producing equipment and reconstructed its polyamide RO membrane producing line, thus effectively decreasing the consumption of materials.






VONTRON

ENGINEERING CASES

Project of Beihai Thermal Power Plant – A Typical Reference of Recycled Water Reuse

The project of recycled water recovery and reuse constructed in Beihai Thermal Power Plant subsidiary to Dalian Thermal Power Co., Ltd. was the key project of Dalian City in 2006, and as a project of “Energy Conservation, Emission Reduction, and Development of Circular Economy”, it was favored with priority by the state-level government.

Vontron’s membrane is currently used by Dalian Thermal Power Co., Ltd. for recovery and reuse of polluted municipal water. It is demonstrated in practice that Vontron’s membrane not only has stable and reliable performance after long period of running, but also enjoys the comprehensive properties equivalent to international advanced level.

Place of Project: Dalian, Liaoning Province

Purpose: Reuse of Wastewater
System Capacity: 12,000 T/D
Vontron Membranes Installed: 175 pcs
Model: FR12-8040

After 5 Years’ Operation

Running Pressure: 1.0 MPa
Temperature: 20 ℃
System Rejection: 98%
System Recovery: 75%
Flow Rate of Single Set: 100t/h

Engineering Case

Beihai Thermal Power Plant

Engineering Case

Project of Ilijan Power Plant

Project of Ilijan Power Plant – A Typical Reference of Seawater Desalination

Invested by KEPCO (Korea Electric Power Corporation) and established in June 2006, ILIJAN Power Plant is the largest one in the Philippines and has ever obtained the reputation of the world's annual best power plant as appraised by Power Magazine of the United States.

In this power plant, a water treatment system is installed to produce the water used for high-pressure boiler, with the seawater as the source water.

Since early December 2007 when VONTRON's LP22-8040 and SW22-8040 elements were installed in the water treatment system, the system remains in satisfactory consistent performance with rejection at 99%.

Engineering Case

Project of Shanghai Coking & Chemical Co Ltd

- A Typical Reference of Boiler Replenishment Water

Incorporated in 1958, Shanghai Coking & Chemical Co Ltd is a large-scale chemical enterprise with total assets at RMB 7 billion (about USD 1.1 billion) and annual turnover at RMB 6.5 billion (about USD 1 billion). An RO system using foreign brand membrane elements was put into operation in a subsidiary of Shanghai Coking & Chemical Co ltd in early 2008. Using the water taken from Huangpu River as its feedwater, the product water was used as the replenishment water for the boiler. The foreign-brand membrane elements were replaced by FR21-8040 elements of Vontron in December 2009.

Following is the comparison of system performance before and after replacement of membrane elements

Item	Before Replacement (End of 2009)	After Replacement (End of 2009)	Initial Operation (Beginning of 2008)
Brand	Foreign Brand	FR21-8040	Foreign Brand
Feedwater Pressure / bar	13.8	10.1	10.8
Inter-stage Pressure /bar	9.5	9.2	9.9
Concentrate Pressure / bar	8.33	8.6	9.33
System Premeate Flow /m^3•h^{-1}	83.33	124	120
System Concentrate Flow /m^3•h^{-1}	25.7	40	40.7
Recovery /%	76.07	75.60	74.7
Feedwater Conductivity /μS•cm^{-1}	700	704	720
Permeate Water Conductivity /μS•cm^{-1}	45.7	15	18
System Rejection /%	93.47	97.9	97.5
Temperature /℃	25	23.4	22.5
Energy Consumption /kw•h•m^{-3}	0.87	0.59	0.65

After being replaced with FR21-8040 elements of Vontron, the system has been running in good conditions, and achieved the goal of decreasing energy consumption while the system remains the roughly same performance, testifying that Vontron's membrane products can fully satisfy the requirements of RO treatment system.

List of References

Name of User	Model	Feedwater	Purpose	Time of Operation	System Capacity
Dalian Thermal Power Plant, Liaoning, China	FR11-8040	Wastewater	Boiler Replenishment Water	2007	12000m³/d
Ilijan Power Plant, Philippines	LP22-8040 /SW22-8040	Seawater	Boiler Replenishment Water	2007	7200m³/d
Tianhe Chemical, China	LP22-8040	Underground Water	Technological Process	2007	2400m³/d
Ruiying Seage Plant, Shandong, China	FR11-8040	Wastewater	Technological Process	2008	5760m³/d
The United Laboratories (TUL) Inner Mongolian Branch, China	LP22-8040	Underground Water	Pharmaceutical Processing	2008	2000m³/d
Yunyang Stevia Company, Jiangsu, China	LP22-8040	Surface Water	Purified Water for Foodstuff	2008	12480m³/d
Jinchuan Group, Gansu, China	LP22-8040	Surface Water	Boiler Replenishment Water	2009	4320m³/d
Shanghai Coking & Chemical Co Ltd, China (Double-pass RO)	FR21-8040	Surface Water	Boiler Replenishment Water	2009	8640m³/d
Haibo River Administration Center, Qingdao, China	SW22-8040	Seawater	Municipal Water Purpose	2009	5760m³/d
Jiantao Chemical, Hebei, China	LP22-8040	Underground Water	For Technological Process	2009	12096m³/d
China Resources Snow Breweries (Yuncheng Branch), China	LP21-8040	Underground Water	For Technological Process	2010	2400m³/d
Cangzhou Water Supply & Drainage Group, Hebei, China	ULP32-8040	Surface Water	For Technological Process in Steel Plant	2010	45369m³/d
Jiugang Steel Group Yicheng Branch, China (Multi-stage RO)	FR11-8040	Wastewater	For Technological Process	2010	7200m³/d
Xi'an Heating Group, China	LP22-8040	Underground Water	Boiler Replenishment Water	2010	12000m³/d
Ruiying Pharmaceutical Group, Shandong, China	VNF-8040		Concentration in Pharmaceutical Manufacture	2010	1200m³/d
Luan Group Changcun Colliery, China	LP22-8040	Underground Water	For Municipal Purpose	2010	4320m³/d
Dalian Development Zone Thermal Power Plant, China Guodian Corporation	FR11-8040	Wastewater	Boiler Replenishment Water	2011	7200 m³/d
Dongguan Liande Woolen Company, China	FR11-8040	Wastewater	For Technological Process	2011	5000m³/d
Anheuser-Busch InBev Brazil Branch	ULP22-8040	Municipal Water Supply	For Technological Process	2011	7200 m³/d
China Resources Snow Breweries (Fuxin Branch), China	PURO-I	Underground Water	For Technological Process	2011	3400m³/d
Dongjia Group, Shandong, China (Two-pass RO)	LP228040	Wastewater	For Technological Process	2011	24000m³/d
Yunfeng Circuit Board Plant, Shenzhen, China	FR11-8040	Wastewater	For Technological Process	2011	1500m³/d
Xindaxin Materials Co Ltd, Henan, China	LP22-8040	Municipal Water Supply	Industrial Water Supply	2011	1920m³/d
Tianjin Wahaha, China	LP22-8040	Municipal Water Supply	Purified Water	2011	4800m³/d

SALES AND SERVICE

Pre-sales Service

Contents of Service

Promotion plans for new product, new technology, new application field; Plans of product and technology advertisement and promotion in professional fields, professional periodicals or other media.

During-sales Service

Contents of Service

Program of training on know-how and skills of product application and inspection; Program of providing or participating in the design of RO system.

Process Flow

The Marketing Dept and the R&D Center shall provide the customers with on-site training on know-how and skills of product application and inspection, and shall participate in design of customer's RO system and on-site instruction, and help the customers in establishing and implementing the standards for product application, inspection and maintenance as well as the working instructions.

After-sales Service

Contents of Service

Acceptance and disposal of complaints on quality assurance service and product quality; Acceptance of customers' request for service; Solicitude on Customers, etc.

Flow Process

A.In case of product quality problem beyond the quality assurance terms:
The regional sales manager shall submit the "Request for After-sales Service", and the quality assurance manager shall dispose of it according to "Control Procedure on Customer's Complaint"

B.In case of product quality problem within the quality assurance terms:
The regional sales manager shall submit the "Disposal of Complaint on Product Quality".

Request for technical service after sales: The regional sales manager shall fill in the "Request for After-sales Service" and submit it to the Chief Technical Officer so as to arrange relevant personnel to provide relevant service.

Request for sales service after sales: The regional sales manager shall fill in the "Request for After-sales Service" and submit it to the Vice President of Marketing so as to arrange relevant personnel to provide relevant service.

Solicitude service to customers: The Vice President of Marketing shall organize the marketing executive and promotion executive or sales executive to conduct this service according to the Service Program.

Service Web – Overseas

Not only covering most region in China, VONTRON's membrane products have been also exported to many countries and regions in the world, including India, Italy, Spain, Germany, Turkey, Korea, Japan, Vietnam, Thailand,USA, Canada, Brazil, Singapore, Taiwan, etc. By virtue of its superior quality and solid brand effect, VONTRON has won high appraisal publicly from the international market.

Service Web – Domestic

Vontron Technology Co., Ltd. owns and operates a manufacturing plant in Guiyang, and has set up sales service sites in major cities of China, including Shanghai, Guangzhou, Wuhan, Ji'nan, Xi'an, Zhengzhou, Chengdu, etc.