Essential is water to life
Vontron presents inexhaustible supply

VONTRON®


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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 lines in Guiyang, amounting to a total yearly capacity of 17 million square meters of RO/NF membrane sheets,and will be expanded to 30 million square meters in 2017.

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.

**January 10, 2006**

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

2000 2001 2002 2003 2004 2005 2006 2007 2008 2010 2011 2012 2014 2015

**July 2007**

Vontron Technology Co., Ltd. was established and registered in Beijing.

**November 2011**

Vontron’s membrane products were certified to WQA Gold Seal

**January 2015**

Vontron is Certified to NSF-61

# CERTIFICATION

Vontron was certified to ISO9001 in November 2011

Vontron was certified to NSF-58 in January 2006 and Certified to NSF-61 in January 2015

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 in May 2010

Vontron obtained the Health Approval issued by the Department of Health of Guizhou Province in August 2012


北京市生活饮用水
供水设备及用品卫生许可批件





# PRODUCTS

## Catalog of Residential RO Elements

| Type | Model | Stable Rejection(%) | Average Permeate GPD ($m^3$/d) | Testing Conditions | | |
|---|---|---|---|---|---|---|
| | | | | Testing Pressure psi (MPa) | Testing Solution Concentration NaCl(ppm) | Recovery (%) |
| Regular Residential Elements | ULP2008-50P | 97 | 50 (0.19) | 60 (0.41) | 250 | 15 |
| | ULP1609-50P | 97 | 50 (0.19) | | | |
| | ULP1609-50F | 97 | 50 (0.19) | | | |
| | ULP1809-50Q | 97 | 50 (0.19) | | | |
| | ULP1809-50P | 97 | 50 (0.19) | | | |
| | ULP1809-100Q | 94 | 100 (0.38) | | | |
| | ULP2309-100P | 97 | 100 (0.38) | | | 30 |
| | ULP2809-200 | 95 | 200 (0.76) | | | 25 |
| | ULP1810-50 | 97 | 50 (0.19) | | | 15 |
| | ULP1810-50Q | 97 | 50 (0.19) | | | |
| | ULP1810-50P | 97 | 50 (0.19) | | | |
| | ULP1810-70 | 91 | 70 (0.27) | | | |
| | ULP2010-80 | 94 | 80 (0.3) | | | |
| | ULP2010-100Q | 93 | 100 (0.38) | | | |
| | ULP1812-50 | 97.5 | 50 (0.19) | | | |
| | XLP2012-50 | 96.5 | 50 (0.19) | 30 (0.21) | 250 | 15 |
| | HOR2012-50 | 97 | 50 (0.19) | 60 (0.41) | 250 | 15 |
| | ULP1812-75 | 97.5 | 75 (0.28) | | | |
| | ULP2012-100 | 94 | 100 (0.38) | | | |
| | ULP2012-125 | 94 | 125 (0.48) | | | |
| | ULP2812-200 | 97 | 200 (0.76) | 100 (0.69) | 500 | 15 |
| | ULP3012-240 | 97 | 240 (0.91) | | | |
| | ULP3012-400 | 95 | 400 (1.52) | | | |
| | ULP3013-400 | 95 | 400 (1.52) | | | |
| | ULP3020-420 | 97 | 420 (1.6) | 100 (0.69) | 500 | 40 |

# Product Catalog

## Catalog of Industrial RO Membrane Elements

| Type | Model | Stable Rejection(%) | Average Permeate GPD ($m^3$/d) | Testing Conditions | | |
|---|---|---|---|---|---|---|
| | | | | Testing Pressure psi (MPa) | Testing Solution Concentration NaCl (ppm) | Recovery (%) |
| Low Pressure Series | LP21-8040 | 99.5 | 9600 (36.3) | 225 (1.55) | 2000 | 15 |
| | LP22-8040 | 99.5 | 10500 (39.7) | | | |
| | LP21-4040 | 99.5 | 2400 (9.1) | | | |
| Extremely Low Pressure Series | XLP11-4040 | 98.0 | 2000 (7.6) | 100 (0.69) | 500 | 15 |
| Ultra-low Pressure Series | ULP21-8040 | 99.0 | 11000 (41.6) | 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) | 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 Series | SW8040XHR-400 | 99.85 | 6000 (22.7) | 800 (5.5) | 32800 | 8 |
| | SW8040HR-400 | 99.8 | 7500 (28.4) | | | |
| | SW8040LE-400 | 99.8 | 9000 (34.1) | | | |
| | SW8040XLE-400 | 99.7 | 11000 (41.6) | | | |
| | SW4040HR | 99.8 | 1600 (6.1) | | | |
| | SW4040LE | 99.7 | 1900 (7.2) | | | |
| | SW2540 | 99.5 | 600 (2.3) | | | |
| | SW4021 | 99.5 | 750 (2.8) | | | 4 |
| | SW2521 | 99.5 | 270 (1.0) | | | |
| Fouling Resistant Series | FR11-8040 | 99.5 | 9600 (36.3) | 225 (1.55) | 2000 | 15 |
| | FR12-8040 | 99.5 | 10500 (39.7) | | | |
| | FR11-4040 | 99.5 | 2200 (8.3) | | | |
| High Oxidation Resistant Series | HOR22-8040 | 99.5 | 9000 (34.1) | 225 (1.55) | 2000 | 15 |
| | HOR21-4040 | 99.5 | 2200 (8.3) | | | |

## Catalog of Nanofiltration Membranes

| Type | Model | Stable Rejection(%) | Average Permeate GPD ($m^3$/d) | Testing Conditions | | |
|---|---|---|---|---|---|---|
| | | | | Testing Pressure psi (MPa) | Testing Solution Concentration | Recovery (%) |
| Residential NF Elements | VNF-1812 | 30±10 | 100 ( 0.38 ) | 60 (0.41) | 250 ppm (NaCl) | 15% |
| | | ≥ 85 | | | 250 ppm ($CaCl_2$) | 15% |
| | VNF-2012 | 30±10 | 120 ( 0.45 ) | 60 (0.41) | 250 ppm (NaCl) | 15% |
| | | ≥ 85 | | | 250 ppm ($CaCl_2$) | 15% |
| | VNF-2812 | 30±10 | 300 ( 1.14 ) | 60 (0.41) | 250 ppm (NaCl) | 15% |
| | | ≥ 85 | | | 250 ppm ($CaCl_2$) | 15% |
| Industrial NF Elements | VNF1-8040 | 30 ~ 50 | 12000 ( 45.5 ) | 100 (0.69) | 2000ppm (NaCl) | 15% |
| | | > 96 | 10000 ( 37.9 ) | 100 (0.69) | 2000ppm ($MgSO_4$) | 15% |
| | VNF2-8040 | 90 ~ 98 | 10000 ( 37.9 ) | 100 (0.69) | 2000ppm (NaCl) | 15% |
| | | > 96 | 10000 ( 37.9 ) | 100 (0.69) | 2000ppm ($MgSO_4$) | 15% |
| | VNF-8040K | > 98 | 10000 ( 37.9 ) | 100 (0.69) | 2000ppm ($MgSO_4$) | 15% |
| | VNF1-4040 | 30 ~ 50 | 2400 ( 9.1 ) | 100 (0.69) | 2000ppm (NaCl) | 15% |
| | | > 96 | 2000 ( 7.5 ) | 100 (0.69) | 2000ppm ($MgSO_4$) | 15% |
| | VNF2-4040 | 90 ~ 98 | 2000 ( 7.5 ) | 100 (0.69) | 2000ppm (NaCl) | 15% |
| | | > 96 | 2000 ( 7.5 ) | 100 (0.69) | 2000ppm ($MgSO_4$) | 15% |
| | VNF1-2540 | 30 ~ 50 | 800 ( 3.03 ) | 100 (0.69) | 2000ppm (NaCl) | 15% |
| | | > 96 | 650 ( 2.46 ) | 100 (0.69) | 2000ppm ($MgSO_4$) | 15% |
| | VNF2-2540 | 90 ~ 98 | 700 ( 2.65 ) | 100 (0.69) | 2000ppm (NaCl) | 15% |
| | | > 96 | 700 ( 2.65 ) | 100 (0.69) | 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 residential RO membrane element 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 residential NF membrane element 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

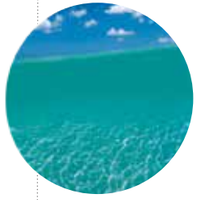
Metallurgical Industry

Foodstuff and Beverage

Pharmaceutical Industry

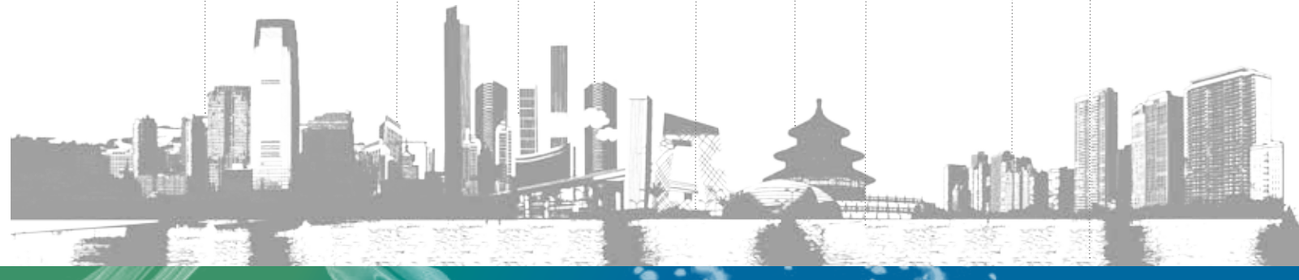
Electronic Industry

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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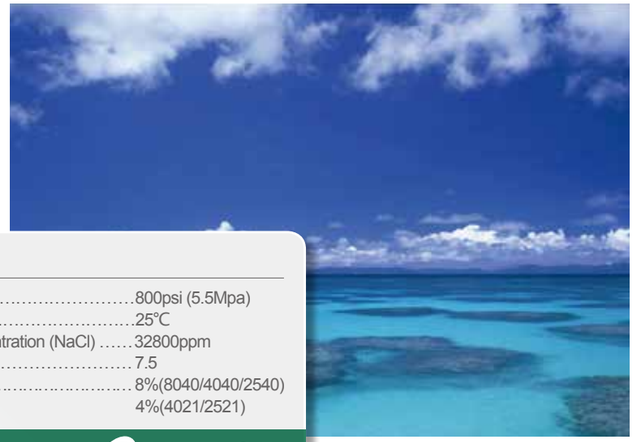
# Seawater Desalination Element – SW Series



**Testing Conditions**

Testing Pressure……800psi (5.5Mpa)
Testing Solution Temperature……25℃
(NaCl) 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.

| Model | Active Membrane Area $ft^2(m^2)$ | Average Permeated Flow GPD($m^3$/d) | Stable Rejection Rate (%) | Minimum Rejection Rate (%) |
|---|---|---|---|---|
| SW8040XHR-400 | 400 ( 37.2 ) | 6000 ( 22.7 ) | 99.85 | 99.75 |
| SW8040HR-400 | 400 ( 37.2 ) | 7500 ( 28.4 ) | 99.8 | 99.7 |
| SW8040LE-400 | 400 ( 37.2 ) | 9000 ( 34.1 ) | 99.8 | 99.7 |
| SW8040XLE-400 | 400 ( 37.2 ) | 11000 ( 41.6 ) | 99.7 | 99.6 |
| SW4040HR | 85 ( 7.9 ) | 1600 ( 6.1 ) | 99.8 | 99.7 |
| SW4040LE | 85 ( 7.9 ) | 1900 ( 7.2 ) | 99.7 | 99.6 |
| SW4021 | 33 ( 3.1 ) | 750 ( 2.8 ) | 99.5 | 99.3 |
| SW2521 | 12 ( 1.1 ) | 270 ( 1.0 ) | 99.5 | 99.3 |
| SW2540 | 28 ( 2.6 ) | 600 ( 2.3 ) | 99.5 | 99.3 |

# Fouling Resistant Element – FR Series

Testing Conditions

| | |
|---|---|
| Testing Pressure | 225psi (1.55Mpa) |
| Testing Solution Temperature | 25℃ |
| (NaCl) 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 |
| FR12-8040 | 400 ( 37.2 ) | 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 (%) |
|---|---|---|---|---|
| HOR22-8040 | 400 ( 37.2 ) | 9000 ( 34.1 ) | 99.5 | 99.2 |
| HOR21-4040 | 90 ( 8.4 ) | 2200 ( 8.3 ) | 99.5 | 99.2 |

Testing Conditions

| | |
|---|---|
| Testing Pressure | 225psi (1.55Mpa) (8040/4040) |
| Testing Solution Temperature | 25℃ |
| (NaCl) 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 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.

### 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 (%) |
|---|---|---|---|---|
| VNF-1812 | 4.3 ( 0.40 ) | NaCl | 100 ( 0.38 ) | 30±10 |
| | | $CaCl_2$ | | ≥ 85 |
| VNF-2012 | 5.1 ( 0.47 ) | NaCl | 120 ( 0.45 ) | 30±10 |
| | | $CaCl_2$ | | ≥ 85 |
| VNF-2812 | 11.2 ( 1.04 ) | NaCl | 300 ( 1.14 ) | 30±10 |
| | | $CaCl_2$ | | ≥ 85 |

**Notes:** The permeate flow of single membrane element may vary within(-20%)-(-20%)

Testing Conditions

Testing Pressure ..... 60 psi (0.41Mpa)
Temperature of Testing Solution..... 25°C
Concentration of Solution (NaCl)..... 250ppm
Concentration of Solution ($CaCl_2$) ..... 250ppm
pH Value of Solution ..... 6.5~8.5
Single Element Recovery .....15%

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# 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 |
| K Series | Designed for bittern denitration and separation-concentration |

Testing Conditions

Testing Pressure .....100 psi (0.69Mpa)
Temperature of Testing Solution.....25°C
Concentration of Solution (NaCl) ..... 2000ppm
Concentration of Solution ($MgSO_4$) .... 2000ppm
pH Value of Solution.....7.5
Single Element Recovery..... 15%

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### 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 ) | 30 ~ 50 |
| | | $MgSO_4$ | 10000 ( 37.9 ) | > 96 |
| VNF2-8040 | 400 ( 37.2 ) | NaCl | 10000 ( 37.9 ) | 90 ~ 98 |
| | | $MgSO_4$ | 10000 ( 37.9 ) | > 96 |
| VNF-8040K | 400 ( 37.2 ) | $MgSO_4$ | 10000 ( 37.9 ) | > 98 |
| VNF1-4040 | 80 ( 7.4 ) | NaCl | 2400 ( 9.1 ) | 30 ~ 50 |
| | | $MgSO_4$ | 2000 ( 7.5 ) | > 96 |
| VNF2-4040 | 80 ( 7.4 ) | NaCl | 2000 ( 7.5 ) | 90 ~ 98 |
| | | $MgSO_4$ | 2000 ( 7.5 ) | > 96 |
| VNF1-2540 | 28 ( 2.6 ) | NaCl | 800 ( 3.03 ) | 30 ~ 50 |
| | | $MgSO_4$ | 650 ( 2.46 ) | > 96 |
| VNF2-2540 | 28 ( 2.6 ) | NaCl | 700 ( 2.65 ) | 90 ~ 98 |
| | | $MgSO_4$ | 700 ( 2.65 ) | > 96 |

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

# 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 July 2015, totally 50 patents have been authorized to Vontron, of which 24 items are patents for invention (including 1 patent authorized in Korea) and 26 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

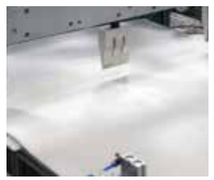
VONTRON

# MANUFACTURING

## Professional
## Manufacture Equipment and Capacity

Vontron owns the core technology for fabricating of membrane sheets, with annual capacity of 17 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.



# 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.

Engineering Case

## Beihai Thermal Power Plant

### 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

## Project of Taiyuan Iron & Steel (Group) Co., Ltd.

Taiyuan Iron & Steel (Group) Co., Ltd. (TISCO) is a large iron & steel enterprises, which has been equipped with largest production capacity in the world and owned the most advanced technology and equipment of stainless steel. The annual steel production of TISCO reached 9.98 million tons in 2013, while sales revenues were RMB 146 billion and profit RMB 500 million, ranking in the forefront of the industry.

Vontron membrane has been used since 2014 in the project of TISCO, for reclamation and reuse of wastewater. The consumption of new water has reduced to 1.45 $m^3$ for each ton of steel,which is the lowest new water consumption for per ton of steel until now. TISCO has been leading in water-saving and emission-reduction in domestic industry, realizing the win-win strategy of water treatment and wastewater utilization.

### Place of Project: Taiyuan, Shanxi Province

**Feed Water Quality:** Municipal sewage & steel wastewater
**Purpose:** Process water
**Online Time:** Early 2014
**System Capacity:** 34000 T/D
**Vontron Membranes Installed:** 1071 pcs
**Model:** New-Type Fouling Resistant Membrane Element

### Benefit Analysis of Project

For the wastewater reuse project, the design permeate is 600 $m^3$/h,and 14000 tons of qualified desalted water are produced from this project per day, saving new water 14000 tons per day and around 5.25 million tons per year.

Engineering Case

# Project of Shanghai Coking & Chemical Co., Ltd.

**– A Typical Reference of Boiler Water Replenishment**

Incorporated in 1958, Shanghai Coking & Chemical Co Ltd is a large-scale chemical enterprise with total assets at RMB 7 billion (about USD 11 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) | Two Years After Replacementn (December 2011) |
|---|---|---|---|---|
| Brand | Foreign Brand | FR21-8040 | Foreign Brand | FR21-8040 |
| Feedwater Pressure / bar | 13.8 | 10.1 | 10.8 | 10.5 |
| Inter-stage Pressure /bar | 9.5 | 9.2 | 9.9 | 8.9 |
| Concentrate Pressure / bar | 8.33 | 8.6 | 9.33 | 8.1 |
| System Premeate Flow /$m^3 \cdot h^{-1}$ | 83.33 | 124 | 120 | 113 |
| System Concentrate Flow /$m^3 \cdot h^{-1}$ | 25.7 | 40 | 40.7 | 36.3 |
| Recovery /% | 76.07 | 75.6 | 74.7 | 75.7 |
| Feedwater Conductivity /$\mu S \cdot cm^{-1}$ | 700 | 704 | 720 | 828 |
| Permeate Water Conductivity /$\mu S \cdot cm^{-1}$ | 45.7 | 15 | 18 | 26.8 |
| System Rejection /% | 93.47 | 97.9 | 97.5 | 97.8 |
| Temperature /℃ | 25 | 23.4 | 22.5 | 27.6 |
| Energy Consumption /$kw \cdot h \cdot m^{-3}$ | 0.87 | 0.59 | 0.65 | 0.673 |

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 | Online Data | System Capacity($m^3$/d) |
|---|---|---|---|---|---|
| **Shanghai Coking & Chmical Co., Ltd. China(Double-pass RO)** | FR21-8040 | Surface Water | Boiler Replenishment | 2009 | 8640 |
| **China Resources Snow Breweries** | LP21-8040/ New-Type Fouling Resistant membrane | Underground Water | For Technological Process | 2010 | 20000 |
| **Dalian Development Zone Thermal Power Plant, CGDC** | FR11-8040 | Reclaimed Water | Boiler Replenishment | 2011 | 7200 |
| **A Company in Shandong, China (two-passes RO)** | LP22-8040 | Reclaimed Water | For Technological Process | 2011 | 24000 |
| **A Circuit Board Factory in Shenzhen, China** | FR11-8040 | Electroplating Wastewater | Industrial water | 2011 | 1500 |
| **Shandong Weiqiao Pioneering Group Co., Ltd.** | FR11-8040/ New-Type Fouling Resistant membrane | Surface Water | Boiler Replenishment | 2012 | 50000 |
| **China Railway Equipment Manufacturing Material Co., Ltd.** | New-Type Fouling Resistant membrane | Wastewater | Boiler Replenishment | 2013 | 24000 |
| **A Sewage Treatment Plant for Pharmaceutical Project** | New-Type Fouling Resistant Membrane | Wastewater | Reclaimed Water Reuse | 2014 | 6000 |
| **Dalate Power Plant, China Huaneng Group** | New-Type Fouling Resistant Membrane | Surface Water | Boiler Replenishment | 2014 | 5000 |
| **Power Plant of China Railway Equipment Manufacturing Material Co., Ltd.** | New-Type Fouling Resistant Membrane | Surface Water | For Production Water Supply | 2014 | 16800 |
| **Shougang Guiyang Special Steel Co., Ltd.** | New-Type Fouling Resistant membrane | Surface Water | For Production Process | 2014 | 7200 |
| **sewage plant of China Railway Equipment Manufacturing Material Co., Ltd.** | New-Type Fouling Resistant membrane | Wastewater | For Production Process | 2014 | 33000 |
| **Tianjin Dagang New Spring Seawater Desalination Co., Ltd.** | ULP32-8040 | Seawater | Seawater Desalination | 2014 | 100000 |
| **SICHUAN COC DISPLAY DEVICES CO.,LTD(COCPDP)** | New-Type Fouling Resistant membrane | Tap water | Ultrapure Water | 2014 | 10000 |
| **Colgate-Palmolive (China) Co., Ltd.** | HOR-8040 | Tap water | For Technological Process | 2014 | 3000 |
| **Dongguan Liande Woolen Co., Ltd.** | FR11-8040 | Printing and Dyeing Wastewater | Reclaimed Water Reuse | 2014 | 5000 |
| **Foxconn Technology Group** | LP22-8040 | Tap water | Ultrapure Water | 2014 | 35000 |
| **Kunming Iron & Steel Holding Co., Ltd.** | ULP32-8040 | Surface Water | Reclaimed Water | 2014 | 11520 |
| **Guizhou Tyre Co., Ltd.** | New-Type Fouling Resistant membrane | Surface Water | Surface Water | 2014 | 2400 |
| **Chongqing Huafeng Chemical Co., Ltd.** | LP2-8040 | Surface Water | Surface Water | 2014 | 9600 |
| **Tangshan Iron & Steel (Group) Co., Ltd.** | FR12-8040 | Steel Wastewater/ Surface Water | For Technological Process | 2014 | 30000 |
| **Hangzhou Wahaha Group Co., Ltd.** | LP22-8040 | Tap water | Pure Water | 2014 | 7200 |

# 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.