SEAWATER DESALINATION

"The most innovative solution to the global water shortage problem"

FILTERTECH QT ENVIRO TECH AWATER DESALINATION SYSTEM











Ministry of SMEs and Startups, Technology Information Promotion Agency, Research Village **R&D** project judged 'successful'

November 2018 Letter of Intent to Cooperate in Seawater Desalination (FILTERTECH/QT Strategic partnership agreement) concluded



2019

Acquired Patent No. 10-2005147 'Seawater Desalination System' Venture business certification

2021

Completed installation of cooling fog system and intelligent quarantine system at the Ministry of Foreign Affairs in Hanoi, Vietnam

management system means that can predict the

2020

Acquired Patent No. 10-2123507 'Cooling Fog Controller Device'

2022

Designated as an excellent innovation cluster Acquire various certifications

Ministry of Gender Equality and Family



What is a seawater desalination device?

Seawater desalination

It is an environmentally friendly water treatment device that desalinates and utilizes seawater and salt sewage from island areas into drinking water, domestic water, firefighting water, agricultural water, and industrial

water. The 'FilterTech seawater desalination device' is capable of producing high-quality drinking water as well as domestic water, and is very convenient for transportation as it can produce drinking water/residential water in areas where it is needed. As a result of water quality analysis of 50 items for drinking water by Incheon Metropolitan City and Jeollanam-do Health and Environment Research Institute, it was judged to be very excellent.



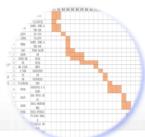
Seawater desalination system process and procedures





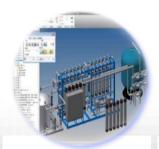
Concept Design

We design the process according to customer requirements.



Production Plan

We share and provide design reliability testing, equipment CEPE, and maintenance costs and service procedures.



Technical Review

We actively communicate with customers and conduct customized technical reviews before project execution.



Equipment Manufacturing

Construction was done using 3D drawings to increase production stability.



Equipment Installation and Construction

Minimizes waste of manpower and material resources for on-site installation of equipment through testing before shipment from the factory.

Professional service personnel can be dispatched to the field to perform all-round technical work.



Follow-up management and maintenance

We regularly contact customers and conduct on-site visits to understand the operation status of the equipment system, prevent possible problems with the system in advance, and improve the lifespan of the equipment.



Filter Tech Seawater desalination patent certificate

Seawater desalination
Patent certificate



1 Patent No. 10-1845674



2 Patent No. 10-2005147



Filtertech seawater desalination device Jeonnam Provincial Office Wando Port demonstration course site

22.12.08
Photos from the demonstration process



Seawater desalination inspection certificate







Jeollanam-do Health and Environment Research Institute water quality test report Incheong Metropolitan City Health and Environment Research Institute water quality test report

Korea Institute of Energy Research Institute energy consumption high efficiency test report



1. Source water collection



2. Connect feed pump filter



3. Raw water tank seawater desalination device connection



4. Connection of drinking water line for domestic use



5. Operation of seawater desalination device



6. Measurement of seawater concentration/residential water, drinking water, etc.



7. Drain process



8. Sample collection



9. Test sample collection completed

Domestic and overseas seawater desalination devices Certifications and Qualifications

Qualification and Honor Certificate of quality



Filter Tech is developing seawater desalination technology at home and abroad through a technology agreement with QT, a Chinese seawater desalination company.



MANAGEMENT SYSTEM CERTIFICATE

주식회사 필터테크

대전광역시 대덕구 덕암북로70번길 35, 2층 (덕암동)

KS Q ISO 9001:2015

인 중 범 위 쿨링포그시스템, 전자식 초미세 무압포그시스템, 해수당수화장치, 필터에 대한 생산

Seawater Desalination Device

위와 같이 경영시스템 표준에 적합함을 인증합니다.

인증번호: SMI-2294Q 유효기간: 2022/11/11 ~ 2024/12/17 발행일자: 2022/11/25

승인 수인



안국표준경영원 서울시 금천구 가산디지털로 212, 1409호

(7) VS. 코오롱디지털타워애스턴)
www.smi21.com Tel.02-6677-9002 Fax, 02-6677-



KAB-QC-42

여크는 한국인형환(Adlica 보내 분절(Ade-OC-CA), 환경(Ade-CC-CA) 및 안반보건(Ade-OC-CA) 경향체제 인증기간으로 인정되었음을 나타내는 인정에고 입
 여크는 국제인정합복가구의 국제 디자간 성호인정 합정에 가입된 인정기간에 의해 인정되었음을 나타내는 이크 입니다.





Overseas seawater desalination quality certificate



Filter Tech Seawater Desalination 9001/14001 ISO Certification

Customer Appreciation Letter
Appreciation letter from customer company certified for quality by Seawater Desalination Supplier

Seawater desalination system Container type

Seawater Desalination System Container Type Seawater maximum 35,000ppm → Freshwater minimum 50ppm

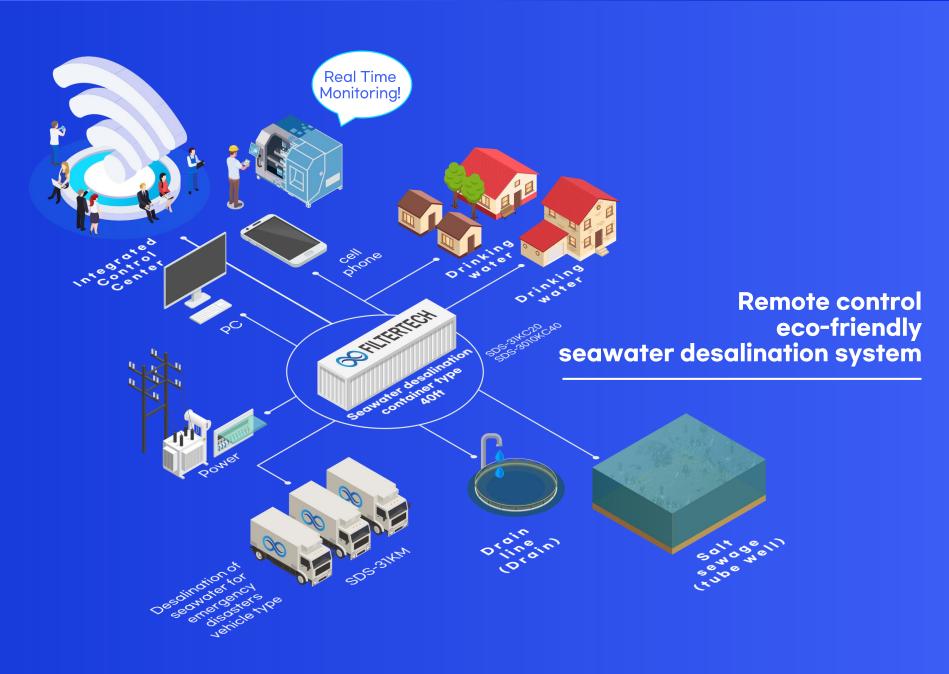












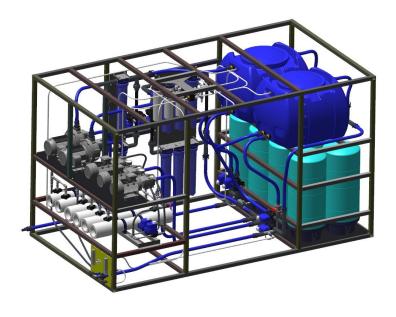
Seawater Desalination Equipment System

- ① SWRO (Sea Water-RO) for domestic water production, BWRO (Brackish Water-RO) for drinking water production
- ② Application of Filter Tech's specialized professional filter
- ③ In case of emergency, operation stability is ensured by configuring multiple pumps (2 units) and restart system is provided through remote monitoring. (2nd shift, continuous production function through alternating operation and availability of the other pump in case of pump failure, emergency remote restart function applied)
- ④ Equipped with remote restart function based on remote monitoring of driving status in emergencies (natural disasters such as lightning)
- © Efficient management and reduced maintenance costs through remote monitoring of filter life

Seawater Desalination Equipment System Model List

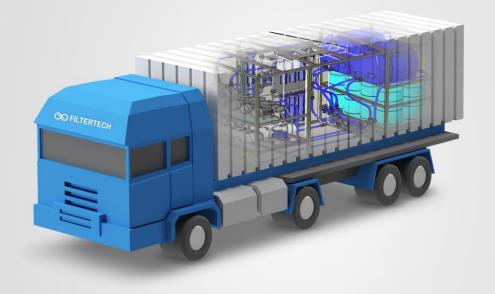
SDS-31KM	SDS-31K	SDS-31KC20	SDS-3010KC40	
0 0 000				
Mobile seawater desalination system Emergency vehicle type	installed type seawater desalination system Indoor installation type	Stationary seawater desalination system Container type 20ft	Stationary seawater desalination system Container type 40ft	
4.8 tons/day of living water 2 ton/day of drinking water	4.8 tons/day of living water 2 ton/day of drinking water	10 ton/day of drinking water	20 ton/day of drinking water	
It is a vehicle-type seawater desalination system optimized for emergency support in case of water outage or disaster. Local production and transportation of I iving water and drinking water in island areas using surface water (seawater) is possible.	This seawater desalination system is installed indoors above ground and produces domestic and drinking water by pumping salt sewage from island areas.Fresh water can be produced, stored, and used at all times.	It is a seawater desalination system that is fixed in the form of a container. It is used to produce bottled and drinking water from the ground. It is possible to produce, store and use saline groundwater from island areas. It always supplies fresh water and is economical and practical.		

System composition



Model: SDS-31K

(Installation type)

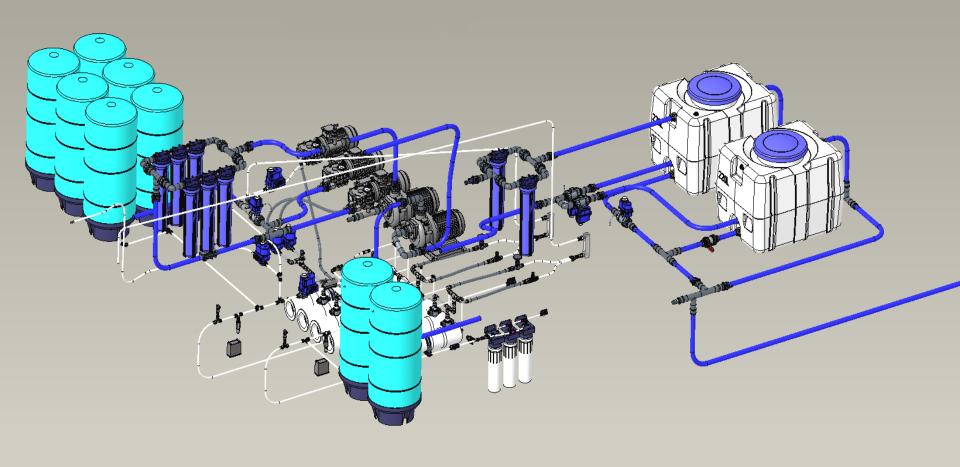


Model: SDS-31KM

(vehicle type)

P&ID

Model: SDS-31K(Installation type), SDS-31KM(Vehicle type)





Brief

fastRO Container series (hereinafter "fastRO C") seawater reverse osmosis system is a containerized desalination solution, with most parts installed into 1 or 2 containers, and freshwater production capacity of 55 to 2,016 m3/day (2,300 - 84,000 liters/hour). Multi-media filter (MMF) will be common set-up, -S version without MMF (turbidity < 1 NTU) for better feed water is available. The water intake recommendation, extra pre-treatment and post-treatment customizing, installation guide commissioning and training services could be provided by the FILTERTECH/QT upon request.



Application

Construction site

Military water supply

· Island residents

· Hotels and Resorts

Agricultural exploitations

· Oil drilling platform

- Mobile water supply vehicle - Other customized applications



Benefits

- Stability and reliability: 30 years of experience in desalination.
- Better filtration: 3 steps filtering process including multi-media filter, pre-filter and main-filter to ensure better protection for high pressure pump, energy recovery device and RO membrane.
- Quick installation and commissioning: most of the installation is completed before delivery, fast deployment.
- Long service life: well-known international brands, non-corrosive duplex for pump and high pressure piping, cpvc or other plastics for piping, and the heavy-duty marine paint is used for frame and container.
- Low energy consumption: using high-efficiency high pressure pump (based on axial piston principle), high-efficiency energy recovery device (based on isobaric pressure exchanger principle, if equipped) and low energy-consumption RO membrane.
- Easy operation: user friendly control by touch screen with remote control.
- Fast restoring feature: in case of malfunction, the whole system can be restored quickly by using standard parts.
- Customization: sensors adding/upgrading according to customer needs, collect data remotely and provide operational consulting service

Containerized vs traditional

Feature	e comparison table	Traditional desalination system	fastRO C	
	Civil Works	100%	44%	
	Installation	100%	14%	
Cost	Commissioning	100%	15%	
Cost	Equipment	100%	91%	
	Total	100%	77%	
	Civil Works	100%	63%	
	Installation	100%	30%	
Time	Commissioning	100%	33%	
	Total	100%	52%	

Water standards

edition, 2012.

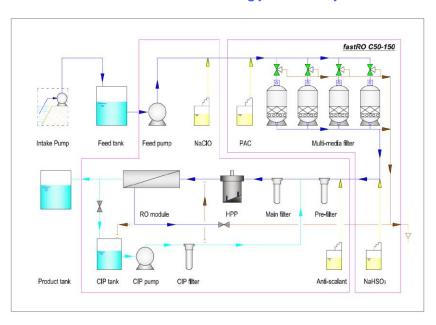
Feed water standards	Feed water standards					
Salinity (TDS)	20,000-42,000mg/L					
Temperature	5-35℃					
Turbidity 1)	< 20NTU					
Chemical Oxygen Demand (COD)	<10mg/L					
Ferrous (Fe ²⁺)	<0.1mg/L					
Manganese (Mn ²⁺)	<0.1mg/L					
Oil and grease	< 0mg/L					
Product water standards 2)						
Salinity (TDS)	< 500mg/L					
рН	6-8					
Turbidity	< 0.2NTU					
Notes: 1)If feed water turbidity is higher than the abov	Notes: 1)If feed water turbidity is higher than the above specifications, extra pretreatment might be needed.					

2)If the source water is natural seawater, the produced drinking water shall meet the WHO Guidelines for Drinking Water quality, 4th

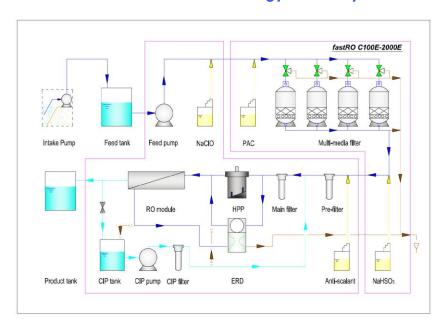
Desalination Process

The desalination process is based on Reverse Osmosis (RO) technology. The process starts by filtering particles from feed water through multi-media filter (No need to use multi-media filter if the feed water turbidity is lower than 1 NTU), then entering the high-pressure pump. Fresh water is pressurized out through the membrane, while concentrated water is discharged after pressure relief/energy recovering (by energy recovery device).

fastRO C50-150 (without energy recovery device)



fastRO C100E-2000E (with energy recovery device)







Technical specifications

fastRO C50-300E

Technical Data	Unit	C50	C80	C100	C150	C100E	C150E	C200E	C300E
Date of Date durate Classes (1)	m³/h	2.3	3.5	4.5	6.5	4.5	6.5	9.8	12.5
Rated Product Flow 1)	L/S	0.64	0.97	1.25	1.81	1.25	1.81	2.72	3.47
Rated Recovery Rate 1)	%	35	35	35	35	35	35	45	45
Rated Feed Flow	m³/h	6.6	10	12.9	18.6	12.9	18.6	21.8	27.8
Min System Pressure 2)	barg	20	20	20	20	20	20	20	20
Max System Pressure 2)	barg	70	70	70	70	70	70	70	70
RO Membrane Spec.		8040	8040	8040	8040	8040	8040	8040	8040
RO Membrane Qty.	pcs	4	6	8	12	8	12	18	21
Weight (dry)	ton	4	5	5	6	5	6	10	11
Container size	ft	20	20	20	20	20	20	40	40
Type -S container size	ft	20	20	20	20	20	20	20	20
Rated Power	kW	13.4	20.1	25.6	36.1	13.0	18.1	25.5	34.1
Energy Consumption 3)	kWh/M³	5.81	5.73	5.6	5.55	2.88	2.78	2.60	2.73
Installed Power 4)	kW	18.9	25.9	36.2	52.2	22.7	27.7	37.3	47.3
Power Input		3PH, 380 AC±10%, 50Hz							







Technical specifications

fastRO C400E-2000E

Technical Data	Unit	C400E	C500E	C800E	C1000E	C1200E	C1500E	C2000E
2.1.12.1.15.1.1	m³/h	16.7	21.5	33.5	42	52	65	84
Rated Product Flow 1)	L/S	4.64	5.97	9.31	11.67	14.44	18.06	23.33
Rated Recovery Rate 1)	%	45	45	45	45	45	45	45
Rated Feed Flow	m³/h	37.1	47.8	71.1	93.3	115.6	144.4	186.7
Min System Pressure 2)	barg	20	20	20	20	20	20	20
Max System Pressure 2)	barg	70	70	70	70	70	70	70
RO Membrane Spec.		8040	8040	8040	8040	8040	8040	8040
RO Membrane Qty.	pcs	28	35	56	70	84	105	144
Weight (dry)	ton	13	13	16+8	20+8	26+9	30+10	36+10
Container size	ft	40	40	40+40	40+40	40+40	40+40	40+40
Type -S container size	ft	40	40	40	40	40	40	40
Rated Power	kW	48.0	60.3	87.3	113.6	141.8	183.1	221.8
Energy Consumption 3)	kWh/m³	2.88	2.80	2.74	2.71	2.73	2.82	2.64
Installed Power 4)	kW	61.3	86.8	134.9	161.9	213.9	265.9	320.9
Input		3PH 380V AC±10%, 50Hz						

Notes:

- 1) The rated product flow and rated recovery rate are based on the design feed of 35,000 ppm and 20°C standard seawater. Higher product flow and higher recovery rate could be reached upon demand.
- 2) The normal operating system pressure shall be above the minimum pressure. The system could be adapted to higher pressure above 70 bar when needed.
- 3) The power consumption is based on the design feed of 35,000 ppm and 20°C standard seawater, but does not include the consumption by the intake pump, product supply pump, Heating, ventilation, and air conditioning (HAVC).
- 4) Installed power includes feed pump, high pressure pump (HPP), energy recovering device (ERD), cleaning in place (CIP) pump, dosing pump and lights.



Description

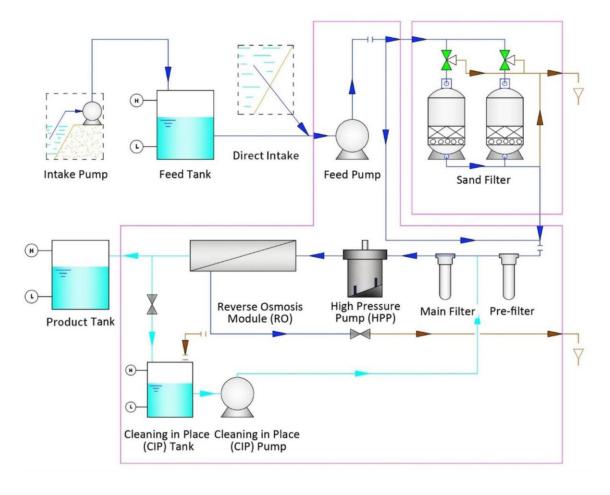
fastRO M series is a small-size modular Sea Water Reverse Osmosis (SWRO) machine. The feed pump, sand filter, pre-filter and main filter, high pressure pump and control, membrane unit are all within modular design, and the fresh water capacity is 120 to 1,100 liters (32-290 USgallon) per hour.



Desalination Process

The desalination process aims to take away salt from seawater. The Reverse Osmosis membrane process starts by filtering feed water particles through applying pressure from the feed pump to the sand filter (No need to use sand filter if the feed water turbidity is lower than 0.3 NTU), then entering the high-pressure pump, to pressurize fresh water out through the membrane, while concentrated water is discharged after pressure relief.

fastRO M System Process



Water quality standards

Feed water standards	
Salinity (TDS) 1)	20,000-40,000 mg/L
Temperature	5-35 ° C
Turbidity ²⁾	< 5 NTU
Chemical Oxygen Demand (COD)	< 10 mg/L
Ferrous (Fe ²⁺)	< 0.1 mg/L
Manganese (Mn ²⁺)	< 0.1 mg/L
Oil and grease	0 mg/L
Product water standards	
Salinity (TDS) ³⁾	< 500 mg/L
рН	6-8
Turbidity	< 0.2 NTU
Notoci	



- 1) If feed water salinity is out of the range, please contact us for solution.
- 2) If feed water turbidity is higher than the above specifications, extra pretreatment might be needed.
- 3) If the seawater is free of harmful contaminants such as nitrate or fluoride ion, the produced drinking water meets the WHO Guidelines for Drinking Water quality, 4th edition, 2012.







Extensive applications

- · Yachts and Fishing boats
- · Public service vessels
- Cargo ship and Freighter
- Lighthouse

System characteristics

- Stability and reliability: We have nearly 30 years of experience in the design of desalination systems.
- Long life: Non-corrosive, non-welding duplex pipe and fittings, SS304 frame with powder coating.
- Better flexibility: The modular design that includes the feed pump, sand filter, pre-filter, main filter unit and membrane unit, there can be many placement combinations to fit the limited space inside a cabin. In addition, the sand filter unit can be omitted, which further increases the flexibility.
- Low noise & vibration level: Using high pressure hose and vibration damper.
- · Simple control: One button ON/OFF design.
- Advanced cleaning options: Automatic fresh water flushing after shut down and integrated chemical cleaning system.

Technical specifications

Technical Data	Unit	M100P	M200P	M500P	M800P	M1000P
0	LPH	120	240	550	820	1,100
Rated Product Flow 1)	USGPH	31.7	63.4	145.3	216.6	290.6
Rated Recovery Rate 1)	%	25	31	33	33	33
Rated Feed Flow	M³/H	0.48	0.77	1.67	2.48	3.33
Min System Pressure ²⁾	barg	10	10	10	10	10
Max System Pressure 2)	barg	64	64	64	64	64
RO Membrane Spec.	inch	2,540	2,540	4,040	4,040	4,040
RO Membrane Qty.	pcs	2	4	4	6	8
Weight (dry) 3)	kg	95	115	200	240	280
Rated Power 4)	kW	1.5	2.1	4.0	5.7	7.6
Energy Consumption 4)	kWh/M³	12.10	8.84	7.33	7.01	6.93
Installed Power 5)	kW	2.02	3.12	5.1	7.15	9.15
Length	m	1.3	1.3	1.6	2.6	2.6
Width	m	0.6	0.6	0.8	0.8	0.8
Height	m	0.7	0.7	1	1	1
Power Input		1phase, 220V, 50Hz 3phase, 380V, 50Hz				

Notes:

- 1) The rated product flow and rated recovery rate are based on the design feed (35,000 ppm, 20°C standard seawater), other recovery rate could be reachable, contact us for details.
- 2) The normal operating system pressure shall be higher than the minimum system pressure above. Higher maximum system pressure could be applicable upon request.
- 3) The dry weight excludes water (operating or other).
- 4) The rated power and energy consumption calculation are based on a design feed (35,000 ppm, 20°C standard seawater), the rated flow and rated recovery rate.

 The calculation include the power of feed pump, HPP, CIP pump, but exclude the power of intake pump and product supply pump.

Warranty

- Provided that the equipment has been running according to the FILTERTECH/QT specifications in the operational manual, FILTERTECH/QT provides 12 months guarantee from date of commissioning, and maximum of 18 months from date of production.



Seawater desalination installation case 1



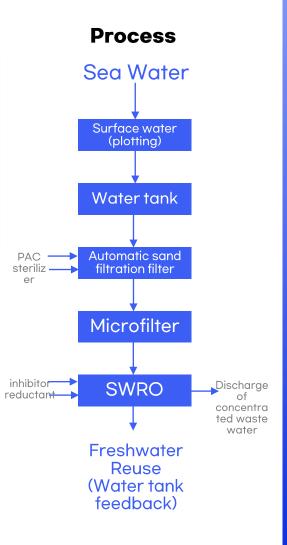
Photo of installation site



On-site photo of Container Seawater
Desalination System



On-site photo of Container Seawater Desalination System



fastRO°

Project: Nuclear power plant 500T/D container seawater desalination

Scale: Inlet: 1250T/D Product: 500T/D

• Location: Ningde, Fujian

• Time: 2020

Key Tech: Standard container seawater desalination

Parameter: In-TDS: ≈33g/L, In-SS: <30mg/L
 SWRO-R: >40%, SWRO-P: 55bar

Goals : Out-TDS : <300mg/L

33,000ppm < 300ppm

Seawater desalination installation case 2



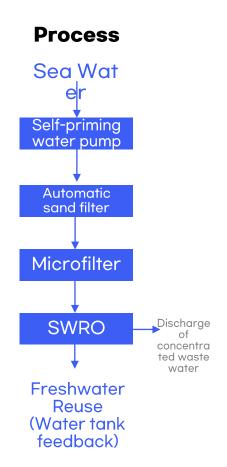
Photo of installation site



Photo of small standard intergration seawater desalination system



Chinese Antarctic Expedition Seawater **Q** DesalinationPhoto of small standard intergration seawater desalination intergration seawater desalination system



iDesalt

Project: Antarctic expedition team seawater desalination for potable use

Scale: Intake: 300T/D Product: 6T/D

Location: Antarctica

• Time: 2017

Key Tech: Small standard intergration

seawater desalination RA-6

Parameter: In-TDS: ≈30g/L, In-SS: <5mg/L

SWRO-R: >20% , SWRO-P: 45bar

Goals : Out-TDS : <250mg/L

30,000ppm < 250ppm

∞ FILTERTECH



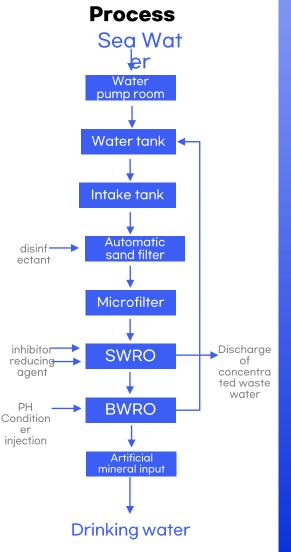
Seawater desalination installation case 3

Photo of installation site



On-site photo of Container Seawater
Desalination System





VIEW



Project: In island constructing

1200T/potable water container

seawater desalination

Scale : Inlet: 2800T/D
 Product:1200T/D

Location: Zhangzi island, Dalian, Liaoning

Time: 2022

Key Tech: UF、SWRO、Mineralization

Parameter: In-TDS: ≈32g/L, In-SS: <20mg/L

SWRO-R: >45%, SWRP-P: 50bar BWRO-R: >85%, BWRO-P: 11bar

 Goals : Out-TDSBWRO : <20mg/L Out-TDS mineralization : ≈50mg/L

32,000ppm about 50ppm

∞ FILTERTECH

QT ENVIRO-TECH 乾通环境科技

Seawater desalination installation case 4

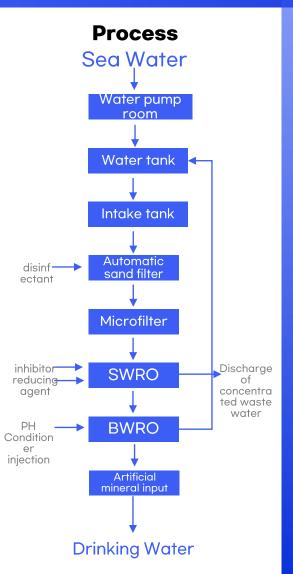
Photo of installation site



On-site photo of Container Seawater Desalination System



9 On-site photo of Container Seawater Desalination System



VIEW



Project: Daojian 1000T/D domestic water container desalination

Scale: Inlet: 2000T/D Product:1000T/D

· Location: Ocean Island, Dalian City,

Liaoning Province

Time: 2022

Key Tech: UF、SWRO、Mineralization

Parameter: In-TDS: ≈32g/L, In-SS: <20mg/L SWRO-R: >45%, SWRP-P: 50bar

BWRO-R: >85%, BWRO-P: 11bar

Goals: Out-TDSBWRO: <20mg/L Out-TDS mineralization: ≈50mg/L

32,000ppm about 50ppm

Seawater desalination installation case 5



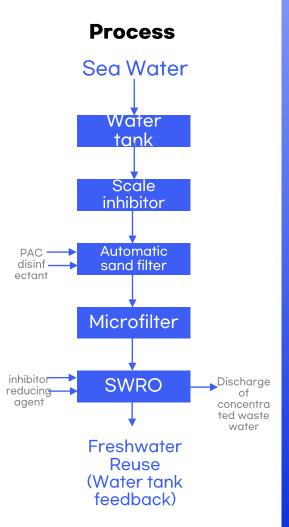
Photo of installation site



On-site photo of Seawater Desalination System



On-site photo of
Seawater Desalination System



 Project : Seawater desalination for power plant

Scale: Inlet: 7000T/D Product: 2*1400T/D

Location: Kendari, Indonesia

• Time: 2018

Key Tech: RO

Parameter: In-TDS: ≈38g/L, In-SS: <5mg/L

SWRO-R: >45%, SWRP-P: 60bar

Goals : Out-TDS SWRO : <400mg/L

38,000ppm < 400ppm

∞ FILTERTECH

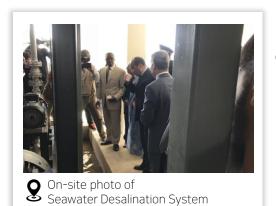
QT ENVIRO-TECH 乾通环境科技

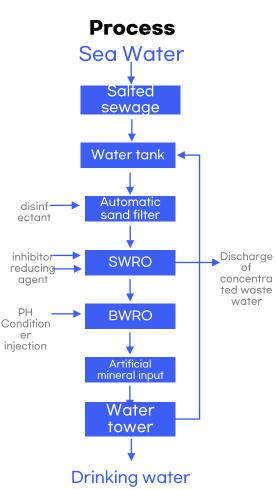
Seawater desalination installation case 6

Photo of installation site



On-site photo of Seawater Desalination System





Project: Seawater desalination for tap water

Scale: Inlet: 2000T/D

Product: 2*500T/D

Location: Mauritania

Time: 2018

Key Tech: SWRO, Mineralization

Parameter: In-TDS: ≈40g/L, In-SS: <30mg/L

SWRO-R: >38%. SWRP-P: 55bar BWRO-R: >85%. BWRO-P: 12bar

 Goals: Out-TDSBWRO: <20mg/L Out-TDS mineralization: ≈50mg/L

32,000ppm about 50ppm

SEAWATER DESALINATION

Filtertech Seawater Desalination Device

There's a lot of water but not enough!
FilterTech's seawater desalination device is the most eco-friendly solution to water shortage..

filtertech.co.kr

Company Name: Filter Tech Co., Ltd. Established: 2017.08.16

Address: 35 Deogambuk-ro 70beon-

gil, Daedeok-gu, Daejeon CEO: Seo-voon Park

Customer Center: 1600-7871

