

HITACHI
Inspire the Next

 **Hitachi Aqua-Tech Engineering Pte.Ltd.**



We Bring Water to All Lives

We Create Solutions to your Water Demand

We Add Life to your Waters

HITACHI

Inspire the Next

Hitachi Aqua-Tech Engineering Pte.Ltd.

OUR VISION

To be a globally trusted brand in providing total solution in water management.

OUR MISSION

Improve lives through engineered water solutions.

Since its establishment in 1977, Hitachi Aqua-Tech has built a strong reputation as a specialist in water management solutions.

As the demand for clean and potable water increases across the globe, the need to recycle, reuse and to safely discharge waste water is also on the rise. With almost four decades of experience in water treatment, the company provides a comprehensive solution to solve a broad spectrum of water supply and management issues by incorporating the latest technologies and techniques.

Other than providing water management solutions, Hitachi Aqua-Tech also has a reputation in the design innovation and creative engineering of pools & spas,

fountains, water playgrounds, irrigation systems and water features.

Hitachi Aqua-Tech provides complete EPC (Engineering, Procurement & Construction) services and maintenance to our clients and aims to provide a one stop solution for resorts, hotels, residential & commercial facilities and municipal developers.

Apart from our excellence as a water management solutions provider, we are continually committed to corporate social responsibility (CSR) by managing our business operation with ethical standards and for the social good.

OUR COMPANY

ABOUT US

Standardised Products

Hitachi Aqua-Tech standardised products are carefully engineered and manufactured with high quality components using proven designs. Through standardisation we are able to provide reliable products at competitive prices.

Our standardised products include RO desalination systems, Membrane Bioreactors (MBR), Filtration Systems and other water treatment systems. The product range and designs are regularly reviewed to incorporate the latest technologies.



Customised Solution

Hitachi's team of water specialists are capable to design, customise, build, install & provide service support for water treatment solution to various challenging market sectors.

With almost four decades of experience, the company has been supporting clients with dedication in delivering the requirements for each project. Backed by in-depth diversified experience, Hitachi Aqua-Tech is able to offer a high degree of customization and design to ensure deliverable of best-fit solutions for the demands of individual customers from different industries.



Lifestyle and Recreation

We are extremely passionate about water. Hitachi aims to bridge people and places by making it possible for people to enjoy and experience water. Innovation is what sets Hitachi apart from its competitors. Each project strives to remain ahead on design trends and weave advanced technologies in all waterscapes.

Formerly known as Aqua Works, Hitachi Aqua-Tech Lifestyle and Recreation has been consistently providing high quality turnkey design and engineering services for the past decades.



OUR EXPERTISE

STANDARDISED PRODUCTS

- Sea Water RO Systems
- Brackish Water RO Systems
- Membrane Bioreactor Systems
- Filtration Systems
- Water Softeners
- Chemical Dosing Systems
- Water Booster Systems
- Solar Powered RO Systems
- Containerized RO Systems
- Marine Water Makers

CUSTOMISED SOLUTIONS

- Fresh Water Maker
- Demineralised Water
- Potable Water
- Boiler Feed Water
- Sulfate Removal Unit (SRU)
- Effluent Recycling
- Oily Wastewater Treatment

LIFESTYLE AND RECREATION

- Swimming Pool Systems
- Water Feature Systems
- Theme Wellness Centre
- Recreational Water Facilities
- Water Playground
- Operation and Maintenance Services

WE SPECIALISE IN WATER SOLUTIONS

DESIGN

Hitachi's team of specialists are dedicated in creating innovative and awe-inspiring ideas in water-related social infrastructure. With a new branch of Design Services, Hitachi Aqua-Tech offers a wider range of possibilities to meet the present and future water market needs.

ENGINEER

Engineering expertise honed over four decades is the reason why Hitachi is able to design and build efficient and robust systems. Hitachi Aqua-Tech systems are built and designed to stand up to challenging environments. Across the entire engineering process, the Company utilises the latest in technology and methodology to provide the best possible outcome.

MANUFACTURE

Hitachi Aqua-Tech follows strict procedures and supervision when it comes to the fabrication and execution of our services and products.

Four decades in the pursuit of excellence has enabled Hitachi to display the highest degree of quality in every detail and at every stage of our production cycle.

INSTALL

With a highly skilled team, our projects are well managed and executed, meeting deadlines and exceeding clients' expectations.

STANDARDISED PRODUCTS



Sea Water RO Systems

Hitachi Aqua-Tech Sea Water RO Systems are available in different capacities to suit the requirements of our customers. These systems are designed to work efficiently and economically to produce high quality fresh water from seawater.

Features & Advantages

- Standardised systems with competitive price
- Energy and cost efficient
- High quality equipment & materials
- Excellent proven track records
- Fast delivery and fabrication capability
- High reliability and excellent service support
- Extensive spare parts supply



Marine Water Makers

Hitachi Aqua-Tech Marine Water Makers are reliable and cost effective fresh water supply solution onboard ships and offshore facilities. The water makers are built to withstand harsh offshore and marine environment. Our Marine RO Water Makers cover a wide range of capacities to meet various requirements from offshore and marine applications.



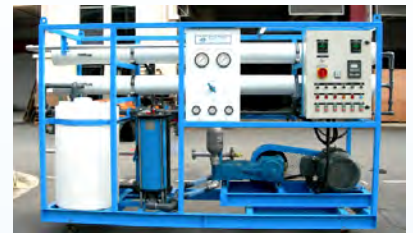
SWRO 10T/DAY



SWRO 20T/DAY



SWRO 30T/DAY



SWRO 75T/DAY

Brackish Water RO Systems

Hitachi Aqua-Tech Brackish Water RO (BWRO) Systems are designed with efficiency and ease of operation in mind. Our BWRO Systems range from a few cubic meters per day to a few thousand cubic meters per day, suitable for households, commercial buildings, industrial processes and municipal water utilities.



Membrane Bio-reactor (MBR) Systems

Hitachi Aqua-Tech has proven track records of Membrane Bio-reactor (MBR) Systems for municipal wastewater treatment. Our MBR Systems have small footprint, it is easy to operate and produce high quality reusable treated water. Standardised package design and customized on-site design are available to suit customer's needs. Training, spare parts, maintenance and after sales services are available during project execution and after system handover.



STANDARDISED PRODUCTS

SEA WATER REVERSE OSMOSIS (SWRO) DESALINATION SYSTEMS

Reverse Osmosis desalination technology converts sea water into fresh water, for drinking, municipal, industrial processes and agricultural usage.

We offer the latest energy saving reverse osmosis technology to ensure an economical supply of high quality potable water from sea water, especially for the water-stressed countries.

FEATURES AND BENEFITS

- Standardised systems with competitive price
- Energy and cost efficient
- High quality equipment and materials
- Easy process control and monitoring
- Excellent proven track records
- Fast delivery with in house fabrication capability
- Minimum site works required
- High quality product water
- Designed for ease of shipping
- High reliability with excellent service support
- Extensive spare parts supply

SWRO SYSTEM EXPLODED VIEW

High Pressure Pipes

High pressure pipes, valves, fittings in contact with sea water are made of corrosion resistant SS904L or super duplex stainless steel materials.

Cartridge/Bag Filter

The cartridge / bag filter is used to prevent particulate matters from entering the RO membranes.

Frequency Inverter Device

The frequency inverter is used to control the pump speed and save energy.

Electrical Control Panel

The PLC + HMI is installed on the control panel for easy operation. It has data logging function and records the key RO operation parameters, time of start/stop, alarms, CIP and flushing date and time.

Booster Pump

The booster pump is installed to compensate the pressure difference between the energy recovery stream and the RO high pressure pump stream. It is made of corrosion resistant materials such as SS904L, AL6XN or duplex stainless steel.

RO Skid

The RO skid is made of mild steel material. It is sand blasted and coated with 3 layers of coating.

Pressure Vessels & Membranes

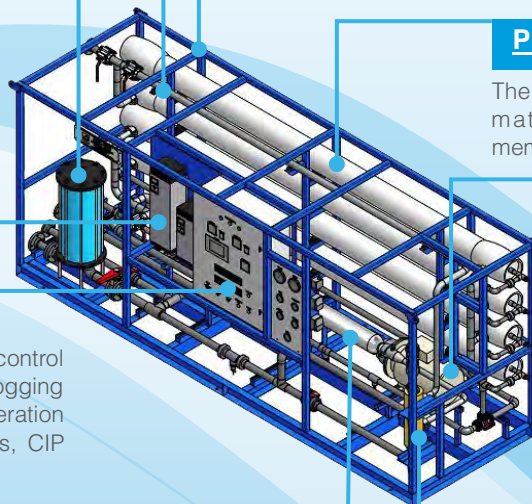
The pressure vessels are made of GRP material. The high performance RO membranes are installed inside.

RO High Pressure Pump

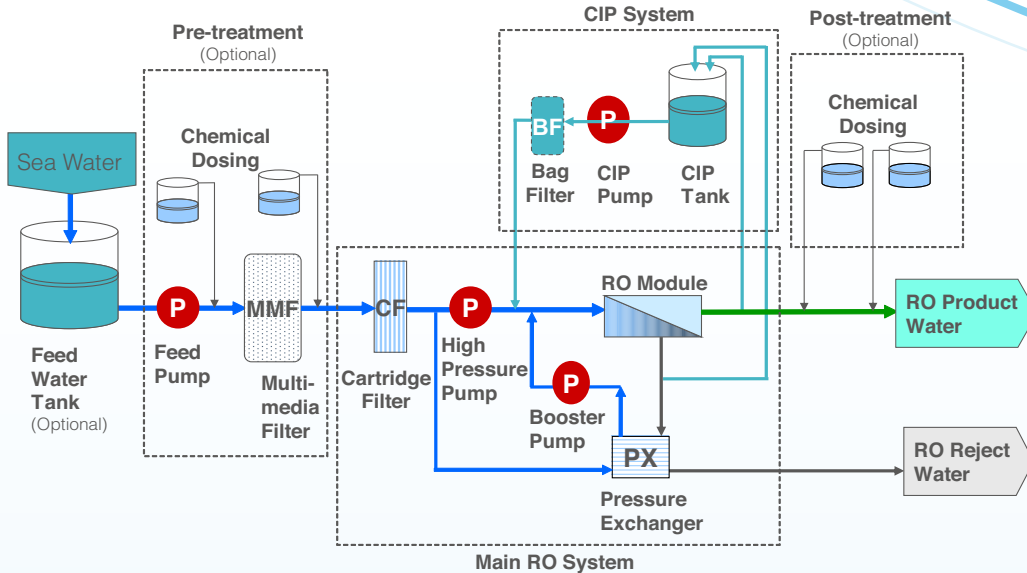
The high efficiency RO high pressure pump is installed to pressurize the RO feed water to overcome the osmotic pressure and push the product water through the RO membrane. It is made of stainless steel such as 904L, duplex or super duplex stainless steel.

Energy Recovery Device

The energy recovery device is used to recover the energy from the reject stream of the RO system. It saves up to 60% of energy consumption for the RO system.



GENERAL PROCESS FLOW DIAGRAM



TYPICAL SPECIFICATION & WATER QUALITY OF SWRO SYSTEMS

Typical Specifications of SWRO Desalination Systems							
Model SWRO -	Product Water Flow	Feed Water Flow	Main RO Skid [^] Dimension (L x W x H)	Overall* Floor Space	Overall* Shipping Weight	Overall* Electrical Loading	Overall* Power Consumption
	(m ³ /day)	(m ³ /day)	(m x m x m)	(m ²)	(kg)	(kw)	(kwh/day)
200TA-PX	200	500	5 x 1.5 x 2	36	5,500	31	660
300TA-PX	300	750	6.6 x 1.5 x 2.1	42	8,500	58	1,180
500TA-PX	500	1,250	6.6 x 1.6 x 2.4	80	13,000	78	1,660
1000TA-PX	1,000	2,500	8.1 x 1.8 x 2.4	128	20,000	142	3,120
1500TA-PX	1,500	3,750	8.1 x 2.1 x 2.4	200	30,000	205	4,430
2000TA-PX	2,000	5,000	8.1 x 2.1 x 2.4	230	38,000	277	5,790

Notes:
 * Overall system includes main RO system, Pre-treatment, Post-treatment and CIP system.
[^] Multiple skids may be required for systems of 500m³/day or bigger capacities.

Typical Water Quality of SWRO Desalination Systems					
Ion	Concentration (ppm)		Ion	Concentration (ppm)	
	Feed	Product		Feed	Product
Ca	440	0.654	CO ₃	0.8	0.001
Mg	1418	2.107	HCO ₃	160	1.841
Na	11876.9	84.579	SO ₄	2976	4.767
K	420	3.737	Cl	21320	136.45
Ba	0.055	0.0	F	1.5	0.019
Sr	14	0.021	B	4.5	0.777
NH ₄	0.1	0.0	SiO ₂	8.0	0.04
TDS	38640	235	pH	8	6.5-7.5

Design Criteria:
 1) Recovery: 40% 2) Feed water temperature: 25°C

* Above information is subject to change without prior notice.

STANDARDISED PRODUCTS

BRACKISH WATER REVERSE OSMOSIS (BWRO) DESALINATION SYSTEMS

Brackish water has moderate level of dissolved minerals and salts. The presence of these impurities makes the water less desirable or unusable for many applications.

Hitachi Aqua-Tech Brackish Water RO Systems are designed with efficiency and ease of operation in mind. Our systems produce water to meet the most demanding specifications and different capacities are available to suit specific requirements.

In addition, secondary treated effluent such as MBR effluent is reclaimable by Hitachi Aqua-Tech BWRO Systems to produce reusable water at reasonable cost.

FEATURES AND BENEFITS

- Standardised systems with competitive price
- Energy and cost efficient
- High quality equipment and materials
- Easy process control and monitoring
- Excellent proven track records
- Fast delivery with in house fabrication capability
- Minimum site works required
- High quality product water
- Designed for ease of shipping
- High reliability with excellent service support

BWRO SYSTEM EXPLODED VIEW

High Pressure Pipes

High pressure pipes, valves, fittings are made of stainless steel material such as SS316L.

Cartridge/Bag Filter

The cartridge / bag filter is used to prevent particulate matters from entering the RO membranes.

Electrical Control Panel

The PLC is installed on the control panel for easy operation. A frequency inverter is also included in it to control the RO high pressure pump speed and save energy.

RO High Pressure Pump

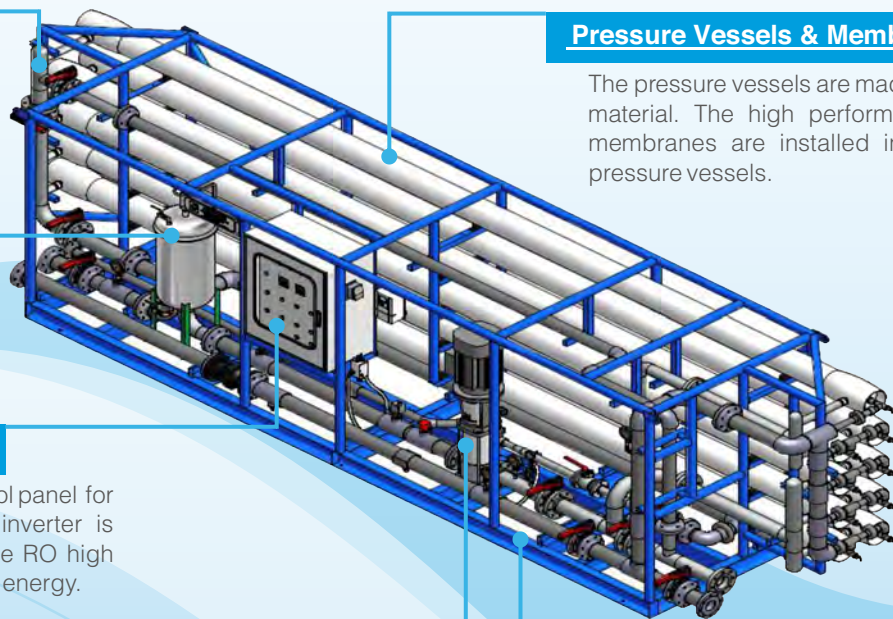
The RO high pressure pump is used to pressurize the RO feed water to overcome the osmotic pressure and push the product water through the RO membrane. It is made of stainless steel such as SS316L.

Pressure Vessels & Membranes

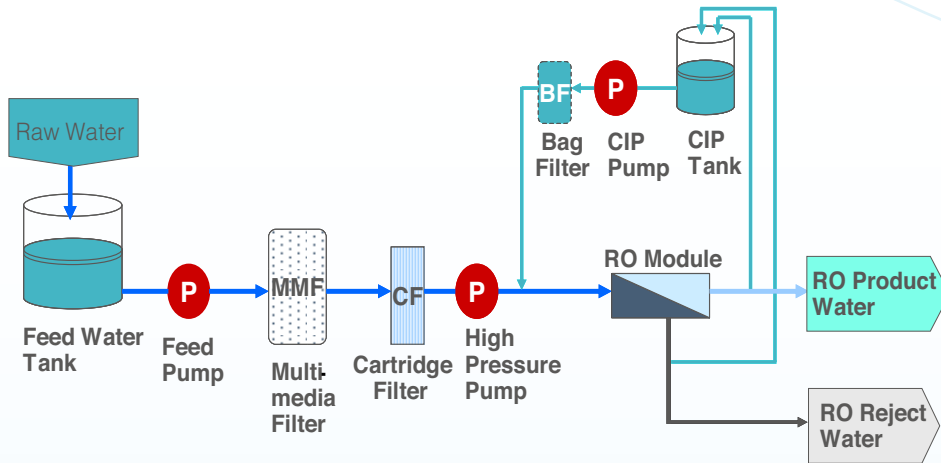
The pressure vessels are made of GRP material. The high performance RO membranes are installed inside the pressure vessels.

RO Skid

The RO skid is made of mild steel material. It is sand blasted and coated with 3 layers of coating.



GENERAL PROCESS FLOW DIAGRAM



Pre-treatment

- Coagulation, flocculation
- Sedimentation
- Multimedia and carbon filter
- Chemical dosing system

Post-treatment

- pH adjustment
- Re-mineralization
- Chlorination
- UV Disinfection

Typical Specifications of BWRO Systems

Model BWRO-	Product Water Flow	Feed Water Flow	Main RO Skid Dimension (L x W x H)	Overall* Floor Space	Overall* Shipping Weight	Overall* Electrical Loading	Overall* Power Consumption
	(m ³ /day)	(m ³ /day)	(m x m x m)	(m ²)	(kg)	(kw)	(kwh/day)
200T	200	250	3.6 x 1.3 x 1.9	32	2,300	11	260
400T	400	500	6.5 x 1.3 x 1.9	43	3,000	22	520
600T	600	750	6.5 x 1.6 x 2.1	50	3,700	28	665
1000T	1,000	1,500	7.8 x 1.6 x 2.1	60	4,500	43	1,025
1500T	1,500	2,000	7.8 x 2.0 x 2.1	66	5,500	55	1,300

Notes:

- 1) Overall system includes main RO system Pre-treatment, Post-treatment and CIP system.
- 2) Product TDS varies depending on feed water quality, recovery ratio and operating temperatures

Typical Design Criteria:

- 1) Feed water TDS: 1500 mg/L
- 2) Typical recovery: 70~80%
- 3) Feed water temperature: 25°C

* Above information is subject to change without prior notice.

STANDARDISED PRODUCTS

MEMBRANE BIOREACTOR (MBR) SYSTEMS

Membrane Bioreactor (MBR) is a combination of membrane technology and biological treatment processes, which is a membrane ultra / micro filtration process and activated sludge process.

FEATURES AND BENEFITS

- Produce consistently high quality effluent water at a competitive cost.
- Small footprint
- Less excess sludge produced
- No offensive odour
- Reduce contamination risk to receiving water body
- Easy capacity upgrading or retrofitting due to modular design
- Proven reliability and easy operation
- Simple process control

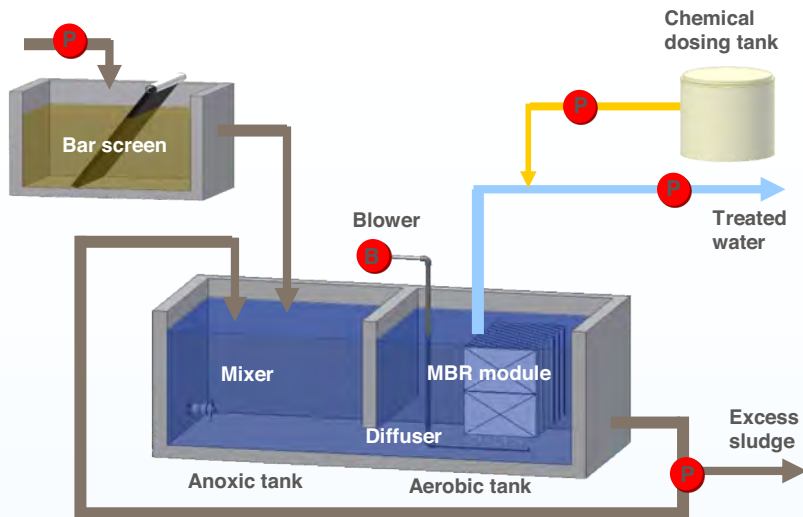


MEMBRANE MODULES

- Plate and frame / Flat sheet configuration
- Durable PVDF and cost effective PES materials available
- Effective air scouring for reduced fouling
- Less cleaning requirement
- Back flushable
- Easy cleaning and maintenance



GENERAL PROCESS FLOW DIAGRAM



HIGH QUALITY EFFLUENT

Hitachi Aqua-Tech MBR sewage treatment system produces high quality effluent from municipal and industrial wastewater.

Table below illustrates the typical parameters of the effluent from MBR and Conventional System.

Parameter	Raw Sewage	Treated Water Quality Comparison	
		MBR System	Conventional System
BOD5 (mg/L)	193	1.0	20
COD (mg/L)	124	7.5	25
T-N (mg/L)	38	5.7	5.7
T-P (mg/L)	7.8	0.3	0.5
SS (mg/L)	250	0.4	20
Coliform (CFU/mL)	3.7×10^5	No detection	<3000
Escherichia Coli phage (Virus) (PFU/100mL)	3.6×10^5	<1	2.7×10^2

The effluent is suitable for reuse in the following applications:

- Irrigation & landscaping
- Fire fighting
- Flushing toilets
- Cooling systems
- Cement mixing
- Pressure testing
- Floor washing



MBR Effluent vs. Raw Sewage

* Above information is subject to change without prior notice.

OFFSHORE WATER TREATMENT SOLUTIONS



Fresh Water Maker

Fresh Water Maker, also known as reverse osmosis unit applies desalination process to remove dissolved salts from seawater thereby producing fresh water. Our design of Fresh Water Maker meets offshore requirements by using robust components such as high pressure pump with API-610 standard compliance, ASME certified FRP membrane housing, offshore corrosion-resistant paint system and explosion-proof certified electrical and instrumentation components. Our fresh water maker has been certified by marine classification societies such as American Bureau of Shipping (ABS), Det Norske Veritas Germanischer Lloyd

Potable and Demineralised System

Safe drinking water and service water is essential on-board offshore platforms and vessels. At Hitachi Aqua-Tech, we provide customized seawater desalination systems that produce quality water safe for drinking. Our systems conform to our client's specifications and requirements for marine, offshore and onshore application and are designed based on the feed water quality and the capacity required. Our systems are able to comply with hazardous area requirements and marine classification standards when necessary.

Sulphate Removal Unit (SRU)

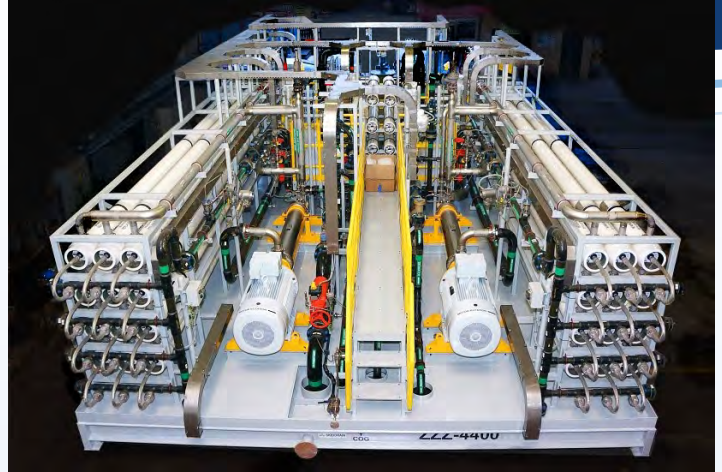
In oil production, seawater is injected into a reservoir to maintain pressure and to channel hydrocarbons to the producing well. The injected water has to meet a certain quality to prevent scaling and blockage of the injection equipment. Seawater contains significant amounts of barium and strontium ions. These ions have strong affinities with sulphate to form strontium sulphate or barium sulphate which will precipitate and deposit on pipe internals and machinery components. These insoluble scales are difficult to remove. Hence, the most effective preventive measure is to remove sulphate ions from the feed water.

We offer engineering services and partner with reliable equipment suppliers to build robust and compact Sulphate

OFFSHORE WATER TREATMENT SOLUTIONS COMPLETED PROJECTS

FPSO OSX 3

Reverse Osmosis System
1113 m³/day x 2 units installed in Zone 2, 2A, T3
Hazardous Area



FPSO Cidade de Mangaratiba MV-24

Reverse Osmosis System
750 m³/day x 2 units installed in Safe Zone Area



FPSO Cidade de Itaguaí MV-26

Reverse Osmosis System
750 m³/day x 2 units installed in Safe Zone Area



OFFSHORE WATER TREATMENT SOLUTIONS COMPLETED PROJECTS

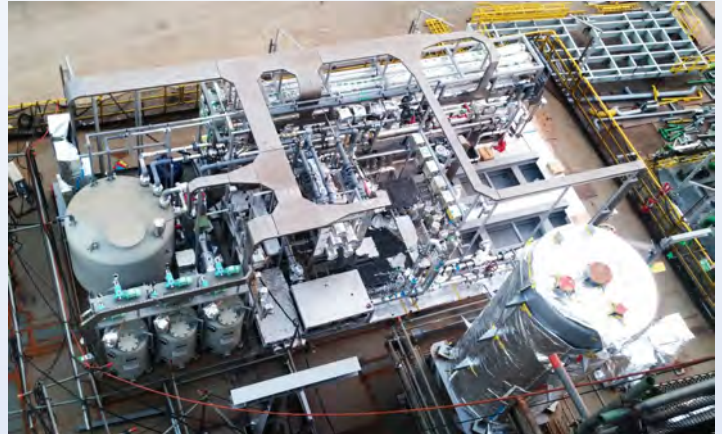
FPSO Cidade de Caraguatatuba MV27

Reverse Osmosis System
750 m³/day x 2 units installed in Safe Zone Area



FPSO Petrobras 74 (P-74)

Fresh Water Maker for Oil Dilution
600 m³/day x 2 units installed in topside of FPSO,
Zone 2, 2A, T3 Hazardous Area



FPSO Petrobras 75 / 77 (P-75 / 77)

Fresh Water Maker for Oil Dilution
600 m³/day x 2 units installed in topside of FPSO,
Zone 2, 2A, T3 Hazardous Area



OFFSHORE WATER TREATMENT SOLUTIONS COMPLETED PROJECTS

FPSO Petrobras 76 (P-76)

Fresh Water Maker for Oil Dilution
600 m³/day x 2 units installed in topside of FPSO,
Zone 2, 2A, T3 Hazardous Area



FPSO Prof. John Evans Atta Mills

Potable water solution 70m³/day x 1 unit installed
in Safe Zone Area.



Jangkrik Floating Production Unit (FPU)

Demin 24m³/day for service usage installed in
topside of FPSO Zone 1, IIB, T3 Hazardous Area



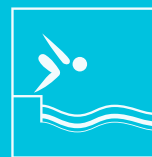
LIFESTYLE AND RECREATION



Swimming Pools

Hitachi Aqua-Tech provides a comprehensive one-stop solution from Concept and Design to Build and Maintenance. Over the years, Hitachi Aqua-Tech has been the market leader setting benchmarks on innovation, quality workmanship and reliability exceeding our clients' expectations.

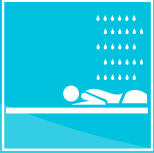
- 1 Sky Habitat Condominium, Singapore
- 2 Guilin View Condominium, Singapore
- 3 Coco Palms Condominium, Singapore
- 4 The Urban Suites, Singapore
- 5 Sheraton Da Nang, Vietnam
- 6 Mapletree Business City, Singapore



SWIMMING POOL SYSTEMS



LIFESTYLE AND RECREATION



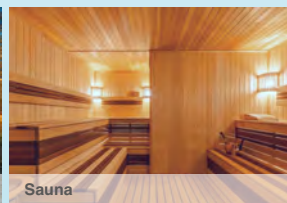
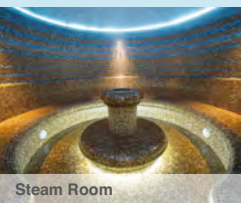
THEME WELLNESS CENTRE



Hydrotherapy Spas

For centuries, water has been used as a form of relaxation and ancient healing for the body & mind. At Hitachi Aqua-Tech, we provide an array of possibilities in design and build of Hydro-massage spas and pools for wellness centres and hospitals.

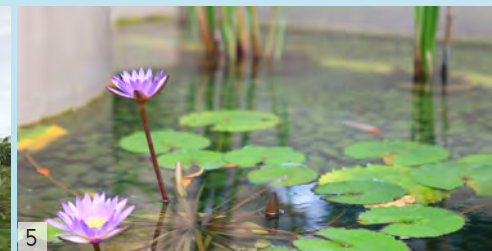
- 1 The Loft, Singapore
- 2 Coco Palms Condominium, Singapore



BIO-POND



BIO-POND



Bio-Pond

Biological filtration keeps natural ponds clear and biologically clean. Our proprietary MARSsystem have been installed in hundreds of ponds, and are still working after more than 10 years in operation.

- 3 The Interlace, Singapore
- 4 Laguna National Golf & Country Club, Singapore
- 5 Clementi Woods Condominium, Singapore

LIFESTYLE AND RECREATION



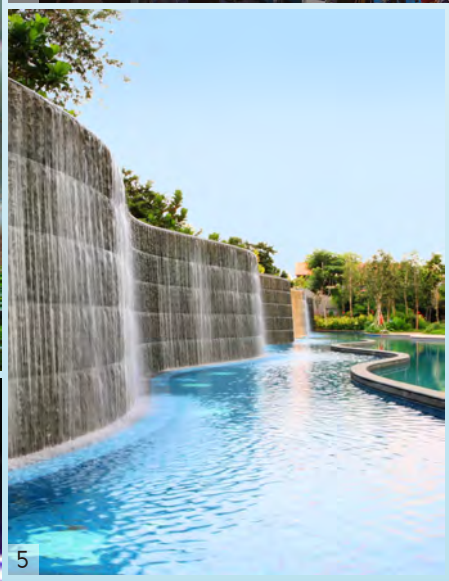
1



2 Artist's Impression by Jewel Changi Airport Devt



3



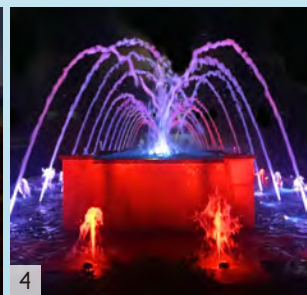
5

Water Feature Systems

Water Elements bring life to the Architecture and Landscape. Whether as the main or supporting element, water impresses, enhances and fascinates- a fact well illustrated by the varied nature of our completed projects.



4

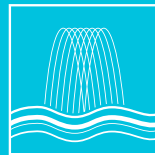


4



6

- 1 Marina Barrage, Singapore
- 2 Jewel Changi Airport, Singapore
- 3 The Pier Condominium, Singapore
- 4 Sheraton Da Nang, Vietnam
- 5 Aalto Condominium, Singapore
- 6 D'Leedon Condominium, Singapore
- 7 Bugis Junction, Singapore



WATER FEATURE SYSTEMS



7



LIFESTYLE AND RECREATION



Water Playground

Playing with human senses, Hitachi Aqua-Tech is driven to create joy, excitement and promote self-discovery and social interactions through our water play park concepts.

We take pride in creating fun-filled and safe playgrounds that are guaranteed to keep children occupied all day.

- 1 Jurong West Sports Complex, Singapore
- 2 The Interlace, Singapore
- 3 Compass One, Singapore



WATER PLAYGROUND





Hitachi Aqua-Tech Engineering Pte.Ltd.

40 Changi South Street 1,
Singapore 486764
Tel: +65 6746 1688, +65 6588 2033
Fax: +65 6747 8224, +65 6588 2022
Email: sales@hitachi-aqt.com
Website: www.hitachi-aqt.com

aqua
works



CERT NO.: 2006-1-0801
ISO 9001: 2008



CERT NO.: 2014-0602
ISO 14001: 2004



CERT NO.: OHS-2014-0491
BS OHSAS 18001: 2007

