Core System Technologies

Ozone Generation Facility

Ozonizer

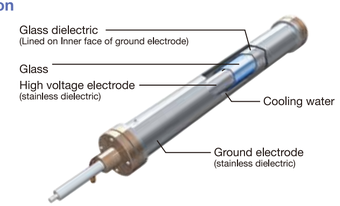
■ Features

- Glass-lined ozone-generating dielectric
- Enhanced cooling system
- Precision discharge gap (u-GAP)
- Low breakage rate

■ Specifications

Generating dielectric	Glass-lined stainless dielectric
Cooling system	Water cooled (double cooling)
Ozone production	132.28 ppd
Power supply	Low harmonics power supply with PWM Converter and high frequency inverter

■ Configuration



〈Glass-lined dielectric〉

Ceramic Membrane Filtration Facility

Ceramic Membrane

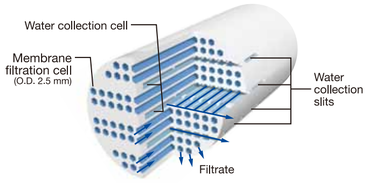
■ Features

- High mechanical strength
- High resistance to chemicals
- Long service life
- High water permeability

■ Specification

Type	Inner pressure monolithic
Nominal pore size	0.1 μm
Dimensions	O.D. 7.1 inch × 5 ft
Membrane area	269 sqft

■ Configuration

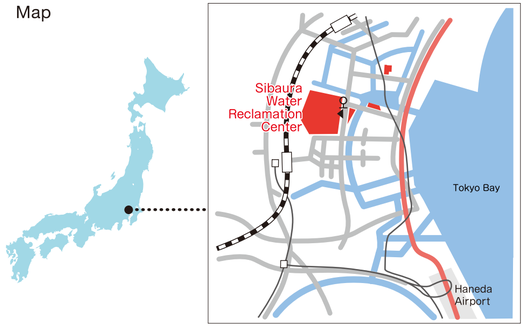


〈Ceramic membrane element〉

SEWERAGE in TOKYO Shibaura Water Reclamation Center

ADDRESS : 1-2-28 Kounan,Minato-ku,Tokyo 108-0075,Japan

Map



METAWATER Co., Ltd.

Shiroyama Trust Tower, 4-3-1 Toranomon, Minato-ku, Tokyo 105-6029, Japan
Tel : +81-3-6403-7512 info-kaigai@metawater.co.jp

Installation Information

Water Reuse System

Shibaura Water Reclamation Center

METAWATER Co., Ltd.

Water is a limited resource on our planet.

Creating a cycle of water is critical for the future of the earth.

METAWATER Co.,Ltd. and the Tokyo Metropolitan Government have collaborated to develop a Water Reuse System based on two core METAWATER technologies: the Ozonizer and the Ceramic Membrane. The system was first installed at the Shibaura Water Reclamation Center in Tokyo, Japan, and began operating in April, 2010.

The Water Reuse System produces superior reclaimed water and meets high filtrate quality. Through the system, METAWATER is contributing to the water environment.

What is reclaimed water?

Reclaimed water is advanced treated wastewater from which solids and certain impurities have been removed for the purposes of sustainability and water conservation.

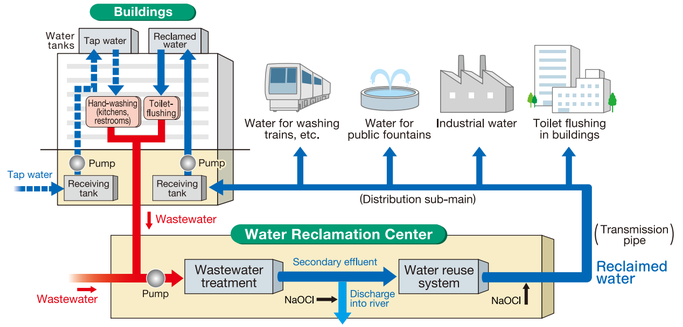
Reclaimed water can be used

- In sustainable landscaping irrigation
- For toilet flushing
- As industrial water (e.g. cooling or washing water)

1.50%

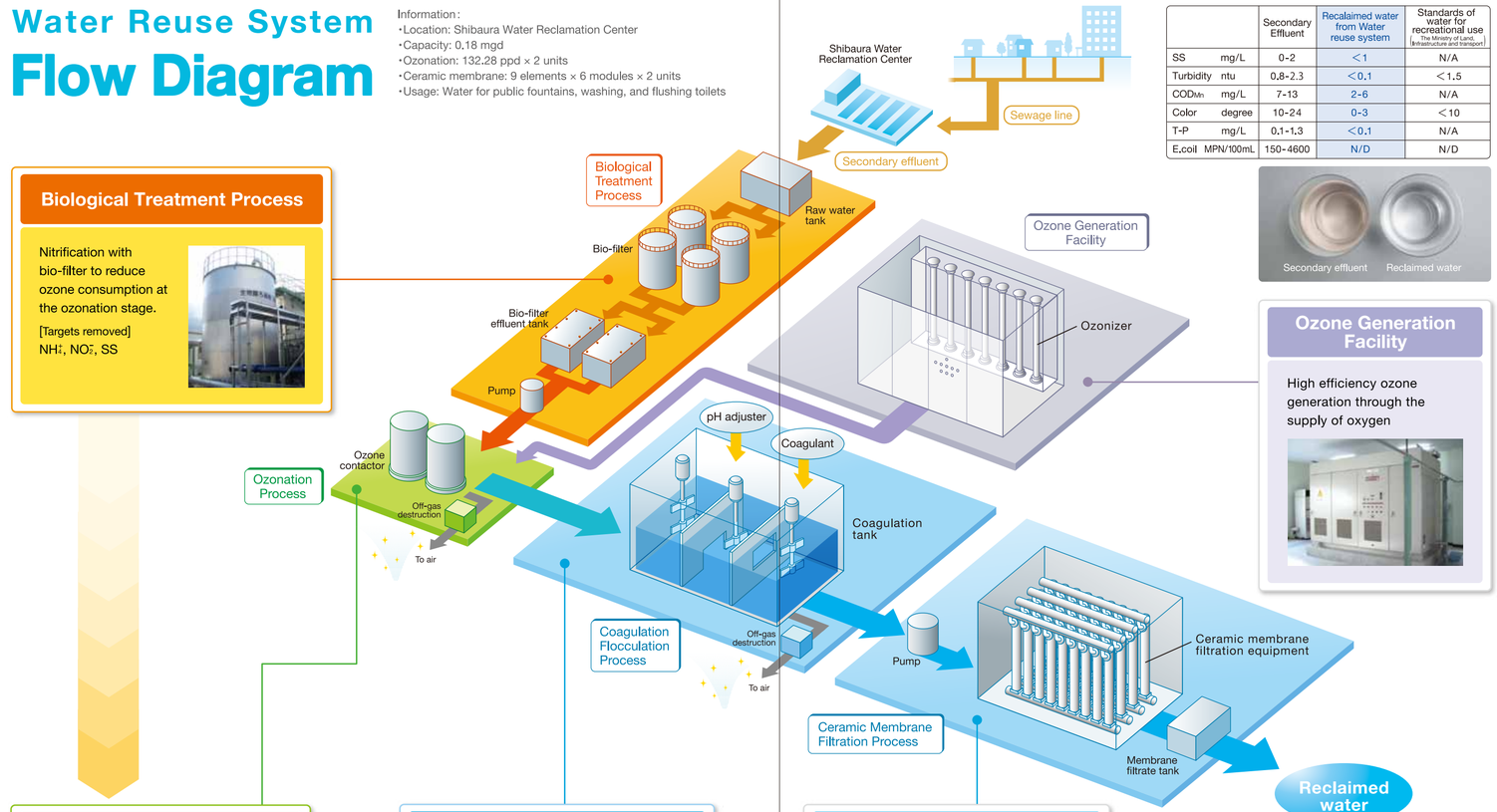
Recycling rate of secondary effluent for one year in Japan. (Ref: Ministry of Land, Infrastructure, Transport and Tourism 2007)

Schematic diagram of reclaimed water supply



Water Reuse System
Flow Diagram

Information:
- Location: Shibaura Water Reclamation Center
- Capacity: 0.18 mgd
- Ozonation: 132.28 ppd × 2 units
- Ceramic membrane: 9 elements × 6 modules × 2 units
- Usage: Water for public fountains, washing, and flushing toilets



		Secondary Effluent	Recalimed water from Water reuse system	Standards of water for recreational use (The Ministry of Land, Infrastructure and transport)
SS	mg/L	0-2	<1	N/A
Turbidity	ntu	0.8-2.3	<0.1	<1.5
COD_{Mn}	mg/L	7-13	2-6	N/A
Color	degree	10-24	0-3	<10
T-P	mg/L	0.1-1.3	<0.1	N/A
E.coil	MPN/100mL	150-4600	N/D	N/D

Biological Treatment Process

Nitrification with bio-filter to reduce ozone consumption at the ozonation stage.

[Targets removed]
NH_4^+, NO_3^-, SS

Ozone Generation Facility

High efficiency ozone generation through the supply of oxygen

Ozonation Process

Odor / color removal, disinfection, and refining of fine particles by ozonation

[Targets removed]
Color, odor, organics, bacteria, viruses

Coagulation/ Flocculation Process

Coagulation/flocculation of SS to prevent membrane fouling

[Targets removed]
SS (organics substances, phosphorous, viruses, etc.)

Ceramic Membrane Filtration Process

Filtration of coagulated water using 0.1μm MF ceramic membrane to remove micro-flocs

[Targets removed]
Turbidity, bacteria