

民間企業の技術紹介資料一覧

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※50 音順

# Company Profile



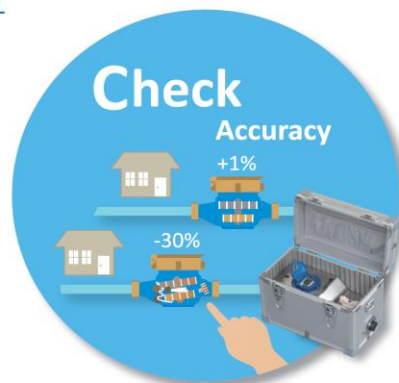
- More than 122 years of experience as a manufacturer
- Over 1800 employees  
Turnover 450 million USD
- Ranked No.1 for water metering & gas metering in japan
- Aichi products used in over 50 countries

Please come & visit us !

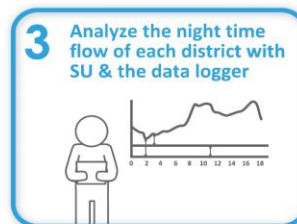
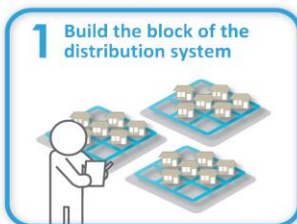


# SAVE THE WATER SAVE THE FUTURE

## Proposals for Non-revenue Water Reduction



### Procedure



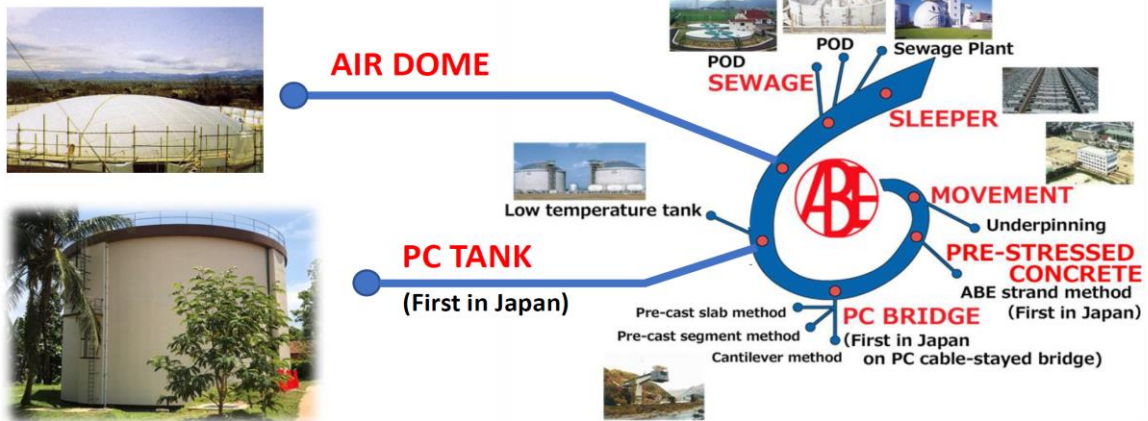


# Pioneer of the PC Technology



ABE NIKKO KOGYO CO., LTD.

## ABE's Technologies

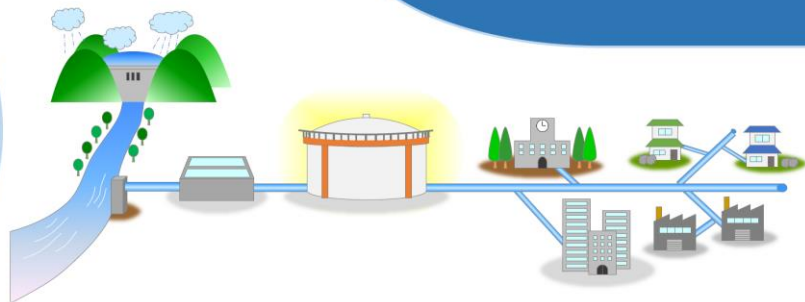


What's PC Tank?

Pre-stressed Concrete Tank  
is used as water reservoir

### Features of PC tank

- ① Strong structure (earthquake & tsunami)
- ② Water-tightness
- ③ Long-term durability & Easy maintenance
- ④ Principle of PC tank is same as a barrel.



Barrel

Same principle

PC tank

→ No leakage !

Hoop (Steel)

Stave (Wood)

PC Tendon

Horizontal & Vertical Tendon (high strength steel)

Doom Roof

(Reinforced Concrete)

Wall

(Prestressed Concrete)

Bottom Slab

(Reinforced Concrete)



# Pioneer of the PC Technology



ABE NIKKO KOGYO CO., LTD.

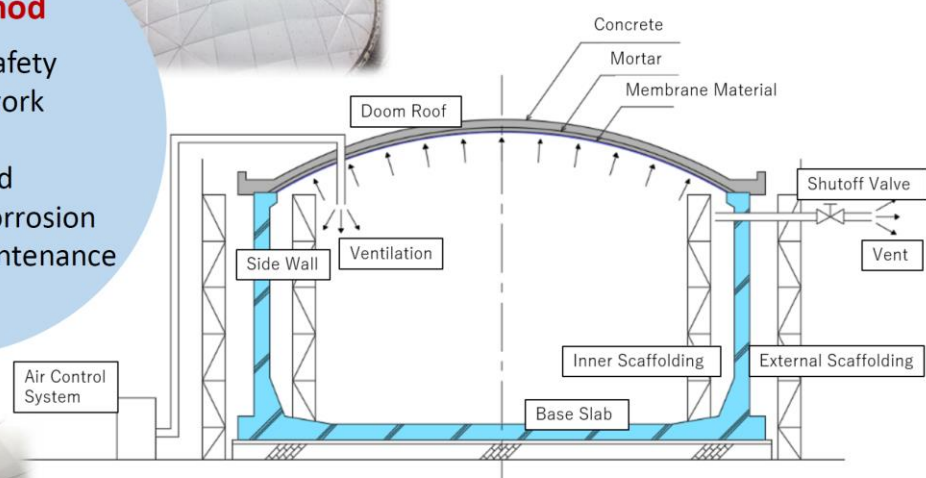


What's Air Dome Construction Method?

A method of constructing a **concrete dome** using a **membrane** material supported by **air pressure**

## Features of Air Dome Construction Method

- ① Improvement of safety
- ② Simplification of work
- ③ Shortening the construction period
- ④ No need for anticorrosion measures and maintenance
- ⑤ Eco-friendly



Inside of Air Dome



## Technical Overview

- ① Applicable to the construction of concrete domes.
- ② A dome is placed using a membrane material supported by air pressure and a mortar shell constructed on it.
- ③ It consists of three parts: membrane material, mortar, and air control system.
- ④ We have achievements of more than 300 units in Japan.



Contact us!

Company name: ABE NIKKO KOGYO CO., LTD.

Headquarters location:

Tokyo Head Office

SK Building-S, 3rd Floor, 2-3-18, Shimoochiai,  
Shinjuku, Tokyo 161-0033, Japan

Contact person: International Business Department

☎ : +81-3-5906-5631

Homepage URL: <http://www.abe-nikko.co.jp>

Gifu Head Office

3-13-3, Rokujo Omizo, Gifu-shi,  
Gifu 500-8638, Japan

Overseas base: Sri Lanka Liaison Office(Colombo)

### 3 株式会社 NJS Cloud Service SkyScraper\_Fcen

#### INFORMATION



Plant Asset Management



<http://www.njs.co.jp>

Sky ScraperFC (Facility Information System) supports strengthening of Water Supply and Sewerage system operation by integrating variety of information (Construction Management, Facility Management, Maintenance Repair, Failure Report, Inspection Management, Operation Management, Cost and etc.) for Water Treatment Plant, Sewage Treatment Plant and Pumping Station throughout the entire period from those construction phase up to Operation & Maintenance.

#### 1 Integrated Information Management

- Integration and Utilizing of Facility Information
- Compiling and Utilizing of O&M practice
- Drawing/Document control

#### 3 Support to Implement the Efficient Operation

- Standardization and Streamlining of Inspection/Survey
- Streamlining of reporting
- Utilizing Mobile Terminal



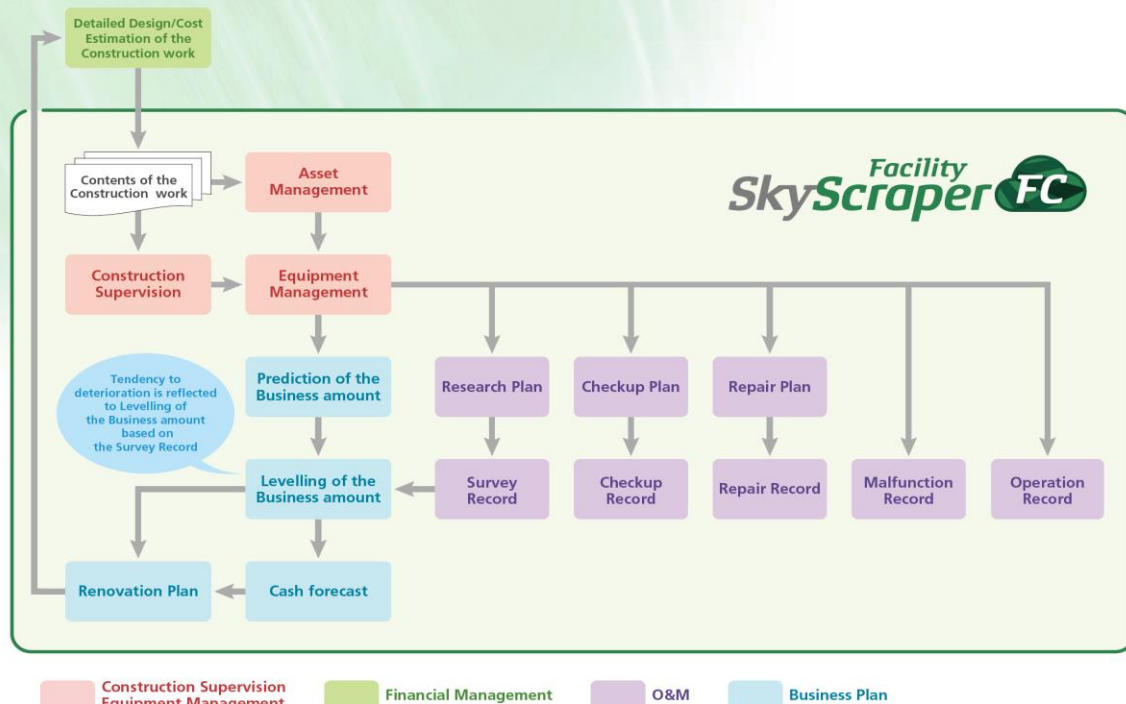
#### 2 Upgrade the Quality of O&M

- Inspection/Survey Record
- Inspection/Survey Planning and Management
- Promotion of Maintenance Engineering

#### 4 Support to Organize the Better Plan

- Construction Plan and Operating Status Management
- Reconstruction/Renewal Planning
- Monitoring O&M Cost
- Proper Fixed Asset Management

#### Example of Asset Management Flow





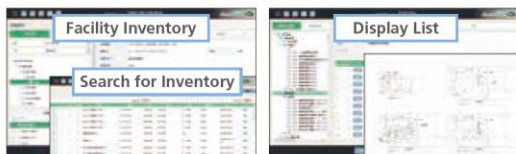
## Facility operation

### – Plant Asset Management –

#### Integrated Information Management information

##### When you need information

Easy to access the standardized data of facilities and assets, and O&M, drawing and specification, then Easy to manage the integrated operation efficiently



Ledger management

Drawing Management

#### Upgrade the Quality of O&M

##### Maintain the better operation and risk management

Management of the systematic and time series O&M information Easy to realize better assets management. Finally assurance of the quality and long life of the assets.



Information Management of Site Inspection

Deterioration Prediction by Survey

#### Support to Implement the Efficient Operation

##### Improvement of the Operation Efficiency

Easy to access the data from the general plan. Improvement of site inspection with mobile tablet. With site information the renewal of the system for the daily operation.



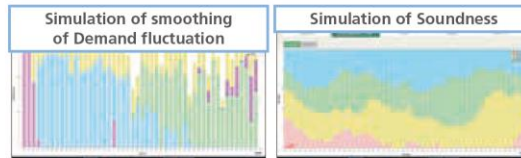
Linkage with Layout Plan

Linkage with Tablet

#### Support to Organize the Better Plan

##### Check of Reliability , Safety and Cost

With the effective utilization of the information of O&M and renovation the minimize the cost of renovation, and maximize the value of the assets, then better integrated operation plan



Demand Forecast and Smoothing

Simulation of Soundness

#### List of Functions of System

Basic features	O&M Management	Upgrade of O&M	Support to long term planning	Common Features
<ul style="list-style-type: none"> <li>Management of Construction Work</li> <li>Management of Facility</li> <li>Management of Drawing and Specification</li> <li>Management of Fixed Assets</li> <li>Search of Inventories</li> <li>Search of layout plan</li> </ul>	<ul style="list-style-type: none"> <li>Management of Maintenance Repair</li> <li>Management of Malfunction</li> <li>Management of Daily Report</li> <li>Management of Utility</li> <li>Stock management</li> </ul>	<ul style="list-style-type: none"> <li>Management of Site Inspection</li> <li>Check of Current Assets(- Soundness Evaluation)</li> <li>Management of Operation</li> <li>Inspection Check Sheet for Tablet</li> </ul>	<ul style="list-style-type: none"> <li>Construction Plan</li> <li>Regular Maintenance Repair</li> <li>Plan of Survey</li> <li>Plan of Site Inspection</li> <li>Business Plan</li> <li>Future Demand Forecast</li> </ul>	<ul style="list-style-type: none"> <li>Login Function</li> <li>Authorization Setting</li> <li>Master Maintenance</li> <li>Form Output</li> <li>Data Backup</li> </ul>

Red color is Optional function



## 4 荏原商事株式会社／株式会社モノベエンジニアリング Monobe products Drinking Water Coil-Spring Solution

Product Introduction by EBARA SHOJI CO., LTD.

Introduce new technology

### Drinking Water Coil-Spring Solution

**Manufacturer: MONOBE Engineering Co., Ltd.**

**Product name: MONO-MAX Filter (Coil-Spring microfiltration device)**

#### Background of Products development

When the conventional filter membrane type is clogged, it is disposed of and becomes millions of tons of industrial waste annually, which is a factor of deterioration of the social environment. In particular, the filter such precise structure is clogging fast, expensive maintenance cost has become a heavy burden for the user. And then, MONOBE Engineering has the ability to regenerate by self-cleaning, can significantly reduce maintenance work and operating costs, and as a result of working on the invention research and development of filters with filtration accuracy and various high functions, "Mono-Max filter" "Successfully commercialized.

#### Product features

##### Feature 1 long life filter

The Mono-max filter is made by molding a stainless steel 316 spring wire into an elliptical shape, and on one side of the oval, a small protrusion with a height of several tens of microns (7 types of 10,20,30,45,60,90,120μm) It was created and processed into a winding spring. A protrusion hits one of the adjacent lines, and this membrane is used for microfiltration. A protrusion hits one of the adjacent lines, forming a fine gap between the winding springs. A filtration aid and SS (dust) are accumulated in this gap to form a filtration membrane, and this membrane is used for microfiltration. The Mono-max filter is a long-life filter with advanced filtration performance and an amazing self-cleaning function that can handle various difficult filtrations.

##### Feature 2 Minimal maintenance with self-backwashing process function

The Mono-max filter maximizes the vibration and elasticity of the spring that responds to even the slightest fluid pressure acting on the surface and inner surface of the spring filter. During filtration, the surface of the filter is pushed by the external pressure to fix the gap between the springs, and the filtration membrane is stably held. During backwashing, the gap between the springs is slightly loosened due to the internal pressure, and the residue stuck to the filter surface is easily peeled off. In other words, since there is no need to replace the filter, less maintenance work enables excellent maintenance operation, which contributes to a significant reduction in production costs.

##### Feature 3 Reduction of running cost

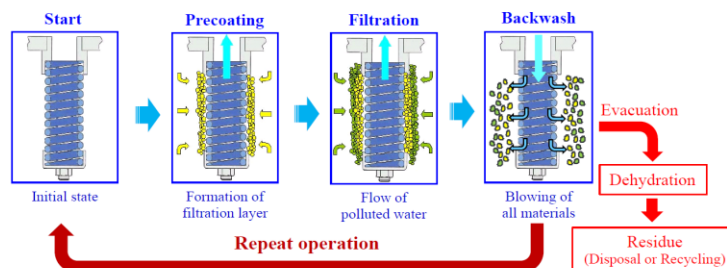
Comparison with conventional filters.

- ✓ Semi-permanent life, minimal maintenance, low running cost
- ✓ Excellent operability, safe driving operation with the touch of a button.
- ✓ Simple and compact design model, the ground contact area is small and microfiltration at low pressure is possible, operating costs such as power consumption can be significantly reduced.

##### Feature 4 Compatible with various filtration classification

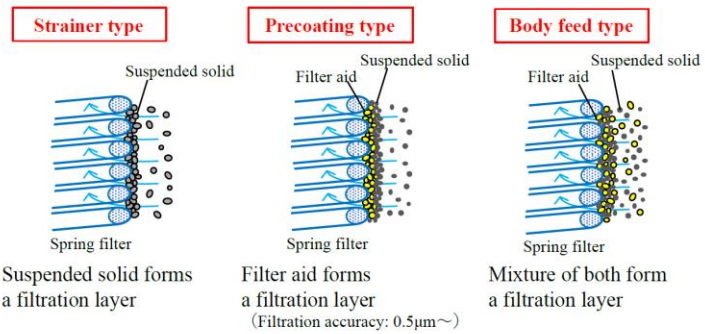
Domestic water, hygiene	Well water, pool, bathtub water, rainwater, industrial water
Beverages, food	Removal of SS in liquid, removal of foreign substances in liquid foods
Civil engineering, construction	Purification and regeneration of construction turbid water, iron removal, manganese removal
Shipbuilding, automobiles	Purification of ballast water, filtration and reuse of car wash wastewater
Machine, metal	Recovery of valuable resources, regeneration of coolant and plating solution
Air conditioning, powder	Dust removal, powder recovery, foreign matter removal in gas
Chemistry, petroleum	SS removal in chemical chemicals
Oils	Removal of foreign matter from cooking oil and industrial oil, Reproduction

#### Coil-Spring Filter MONO-MAX Loop of Filtration & Backwashing process

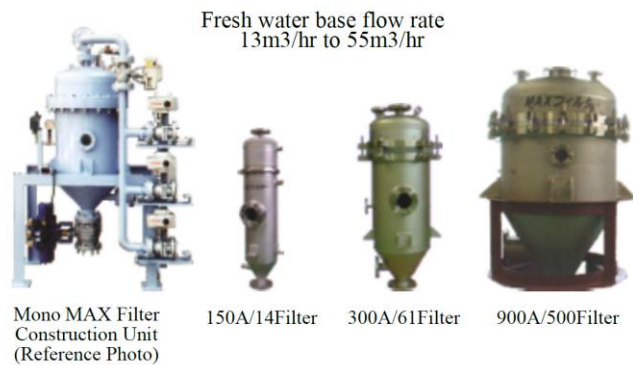


Tightening coil for filtration & Relaxing coil for backwash  
Available under high temperature (500°C), High pressure (1.5MPa),  
Low pressure (0.02MPa), High SS (10,000ppm depend on filtration material)

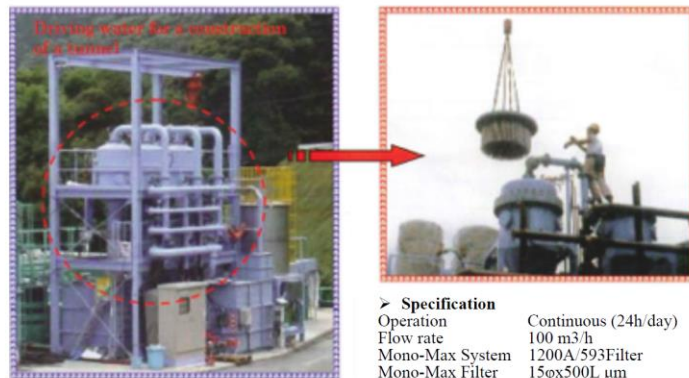
### Coil-Spring Filter MONO-MAX Spring Filter Filtration Method



### Coil-Spring Filter MONO-MAX Unit Specification



### Coil-Spring Filter MONO-MAX Job reference & Filtering performance of Mono-Max



Samples	Raw Water (Before Filtering)	Filtrated Water (After Filtering)	Before Filtering	After Filtering
Chromaticity (TCU)	16	1		
Turbidity (NTU)	6.5	< 0.1		
Bacilli (unit/ml)	7000	0		
Colon Bacilli	+	Impossible to detect		
Fe (mg/l)	3.94	0.03		
Mn (mg/l)	0.146	0.003		

### Particular characteristics

- Able to maintain as high characteristic as new product by backwashing.
- Easy handling in addition to being energy saving and man-power saving.
- compact, ultra-simple and durable precision filter for high-speed filtration of particles with a diameter of 0.1 to 0.5μm.
- Long life brings less initial and less running costs than other types.
- Application for high pressure and high temperature liquids.

### ※ Notice of before adopting a Mono-Max Filter

- Incapable of filtering solutes in solvents.
- In case of treating with emulsions and solvents, bridges formed on surface of filter do not work successfully.
- Applications for high viscous liquids or uneasy slurries to filter are not effective.
- Incapable of separating oil from water.

What is bioassay? How does it work?

Why is fish monitoring (bioassay) necessary ?

## What is bioassay? How does it work?

### What is bioassay ?

- Biological detection
- Biological poison test
- **Bioassay**  
bio=creature assay=assessment,

### Comparing to chemical analysis

- Creatures can respond to unknown toxics and complex
- Above all , it is inexpensive.
- It respond quickly and it is environment-friendly.

	Chemical analysis	Bioassay
analyzing tool	reagent	Biological material
Target of evaluation	Chemical reaction	Biological response

### Bioassay has been used since ancient times.

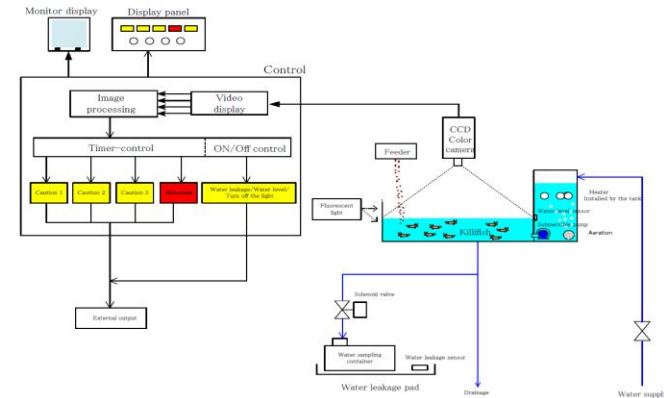
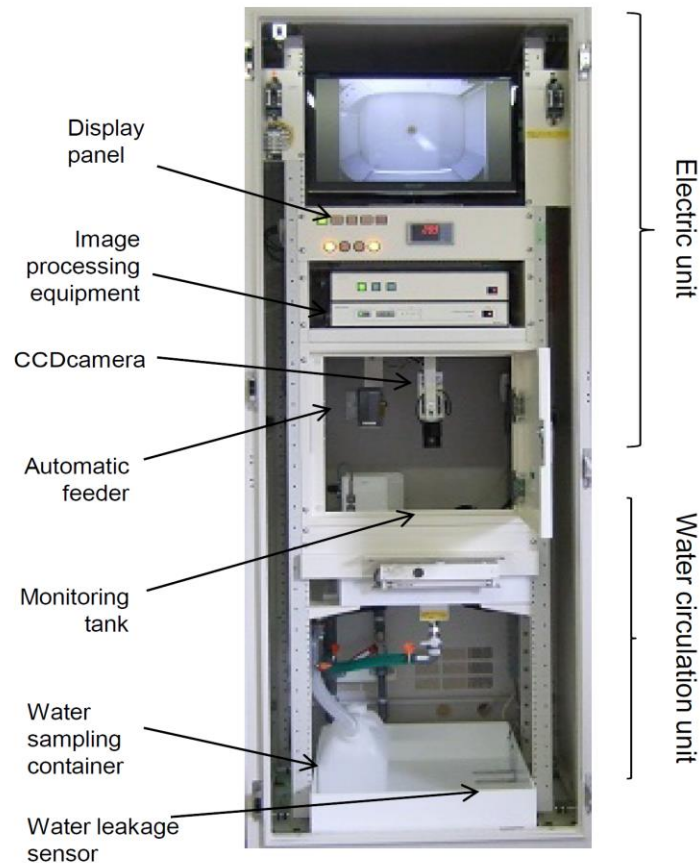
- It can be used with familiar creatures.
- Familiar creatures are easily available.

**Bioassay is very effective and inexpensive because fish responds to 97% of 970 acute toxic chemicals which is poisonous to human body.**



## Why is fish monitoring (bioassay) necessary?

The structure of this equipment is simple and it can automatically monitor the small fish in the tank for 24 hours. Remote monitoring are also possible.



**It is easy to deal with any problems because there are 3 steps of “Caution” before abnormality activation.**

Structure : Indoor stand-alone type (anti-seismic structure : anti-SG capability 600kg)  
 External dimension : W700 × H1800 × D700  
 Power supply voltage : AC100V  
 Electric capacity : 1280W (When using the heater)  
 Image output : 3 points (NTSC 1V<sub>p-p</sub>)  
 Alarm output : 9 points (No -voltage a-contact)  
 Communication output : 1 point (Ethernet)

## 「MINI SHIELD TUNNELING METHOD」

Small section shield tunneling (Diameter 1,000mm~2,000mm)

### ● Expected Effects

Long distance construction without open-cut from start point to finish point can reduce traffic disturbance and impact on the living environment

### Summary

- This method is a long distance non-open-cut tunneling method used in the routes including urban areas, narrow roads, river and railway crossings, and nature reserves.
- The constructed tunnel is suitable for use as a sewage pipe, or as a "sheath tube" for inserting water supply pipe, agricultural pipe, industrial water pipe and electric power pipe.

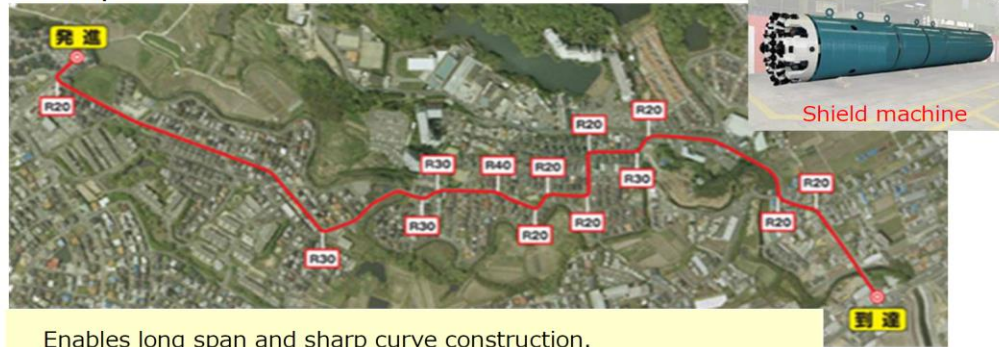
### Features

- Finished Inner Diameter 1000 mm ~ 2000 mm
- Long Distance (Maximum 2300mm by one span), Sharp Curve (R=10 m) and Steep Vertical Curve
- Stable shield segment structure with 3 hinge connections and durable reinforced concrete with epoxy coated steel bars
- Can adapt to a variety of soil conditions (Cutter bit can be replaced inside the machine.)

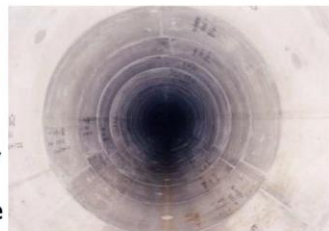
### Remarks

- Preliminary survey of the burial condition is required

Example of construction route



Enables long span and sharp curve construction.  
Eliminate many intermediate shaft  
(span length more than 2 km, minimum curvature radius R=10m)



[sewerage]  
Small Section Shield +  
Interior Lining



[Sheath pipe for water supply]  
Small Section Shield +  
Ductile iron pipe  
(earthquake-resistant pipe)



[Sheath tube of electrical cables]  
Small Section Shield +  
power cable tube

<Examples of various applications>

## 「MINI SHIELD TUNNELING METHOD」

Small section shield tunneling (Diameter 1,000mm~2,000mm)

Long distance construction without open-cut from start point to finish point can reduce traffic disturbance and impact on the living environment

### Features of the technology

- **LONG CONSTRUCTION SPAN**

- It enables long- distance construction, easily constructing over 1,000m per span. The MINI SHIELD TUNNELING METHOD sufficiently satisfies recent demand for long-distance construction, in consideration of environmental impact.

- **SHARP CURVE CONSTRUCTION**

- The longer an extension of construction becomes, the more curves must be constructed. The MINI SHIELD TUNNELING METHOD can meet sharp and steep curves with a radius of 10m.

- **STABLE AND STRENGTH SEGMENT**

- It achieves high stability and strength by constructing tunnel with segment divided into three equal parts.

- **LOWER COST**

- The method can omit a secondary concrete lining. Accordingly, it enables economical construction that can be completed in shorter time with lower cost, when compared with conventional shield methods.

### <Issues of pipeline development in urban areas>

Traffic congestion



Sharp curve road



Many underground utilities



Congestion of buried pipelines, narrow areas, traffic congestion, crossing rivers, etc.

- Difficult to develop pipelines by open-cut method
- A construction method that allows long span and sharp curve with less number of vertical shaft is required
- Expensive with conventional trenchless method (Large section shield method)

**<Solution> Pipe development by 「MINI SHIELD TUNNELING METHOD」**  
with 40 years of experience  
(Cumulative total of 570,000m construction in domestic market, as of Dec.2020)



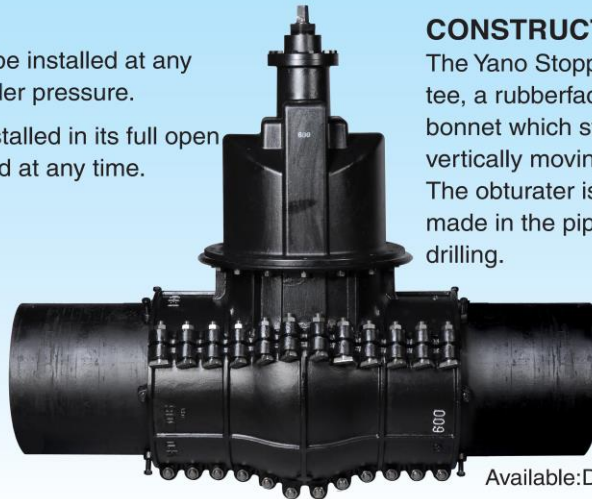
# YANO STOPPER

## WATER PIPELINE STOPPER Installed under pressure

### FEATURES

The Yano Stopper can be installed at any part on the pipeline under pressure.

The Yano Stopper is installed in its full open state, and can be closed at any time.



Available: DN75-600mm

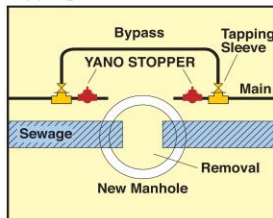
### CONSTRUCTION

The Yano Stopper consists of a split tee, a rubberfaced obturator and a bonnet which stores a spindle for vertically moving the obturator. The obturator is inserted into a cut hole made in the pipe by under pressure drilling.

### EXAMPLES OF PRACTICAL APPLICATION

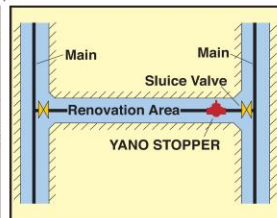
#### Installation for removal of the main

To remove the existing main in connection with sewage construction, together with tapping works.



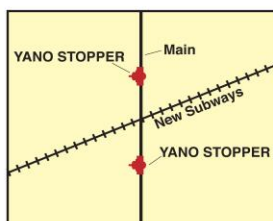
#### Installation into the pipe renovation area

When the sluice valves are out of order or if there is no valve.



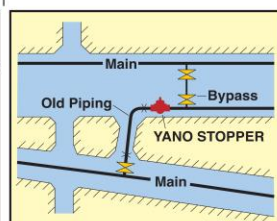
#### Installation for precautionary measure

As an urgent valve, in connection with underground construction.



#### Installation for removal of old piping

To remove the existing old piping, after bypass piping.



KEEP THE LIFE LINE,  
LINK THE NEXT

TAISEI KIKO CO., LTD.  
[www.taiseikiko.com](http://www.taiseikiko.com)



# TAI-FLEX

Ductile Cast Iron Ball-type Flexible Joint TF-80 series

Protects important "Life line" and applied widely  
for every possible position.



## TAI-FLEX(TF-80)

TAI-FLEX is a ductile iron flexible expansion joint which was developed for the purpose of protecting pipeline from pulling out of jointed parts and/or damage which are caused by ground subsidence in reclaimed land and soft ground.

Single Type DN75–600mm  
Double Type DN50–1800mm



Inspecting water tightness of the world largest TAI-FLEX DN 1800mm of subsiding

- \*Examine earthquake-proof with the world largest liquefaction testing machine.
- \*Achieved retaining force more than 3DkN for all size.
- \*Non bolt and nut, light weighted, compact.
- \*Sufficient bending angle and subsidence.
- \*Rubber sealing with excellent water tightness.
- \*Correspond simultaneously to elasticity, bending, torsion.

 **TAISEI KIKO CO.,LTD.**





# TABUCHI CORP.

## Company Profile

TABUCHI Corporation is a leading company of water supply equipment in Japan and focusing on the development, manufacture and sales of water supply products.

### Corporate Outline

- Foundation July 1941
- Capital Fund 353 million yen
- Sales Revenue 12 billion yen/year
- Employee 375

### Certification

- JIS B 2061, JIS K 6779, JIS K 6788  
JIS K 6793, JIS K 6770
- ISO 9001 ISO 14001
- JWWA (Japan Water Works Association)



Location in Japan



Head Office



Kagoshima Factory

TABUCHI CORP.





## Service Saddle with Corporation Stop

Improve water leakage ratio and Less leakage from pipe connection with TABUCHI products

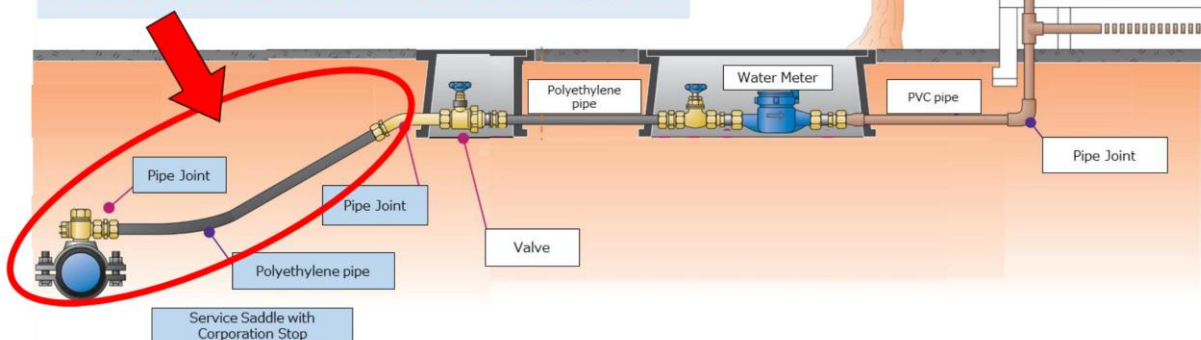
### features

- No water leakage from our products
- High cost performance system
- High durability products

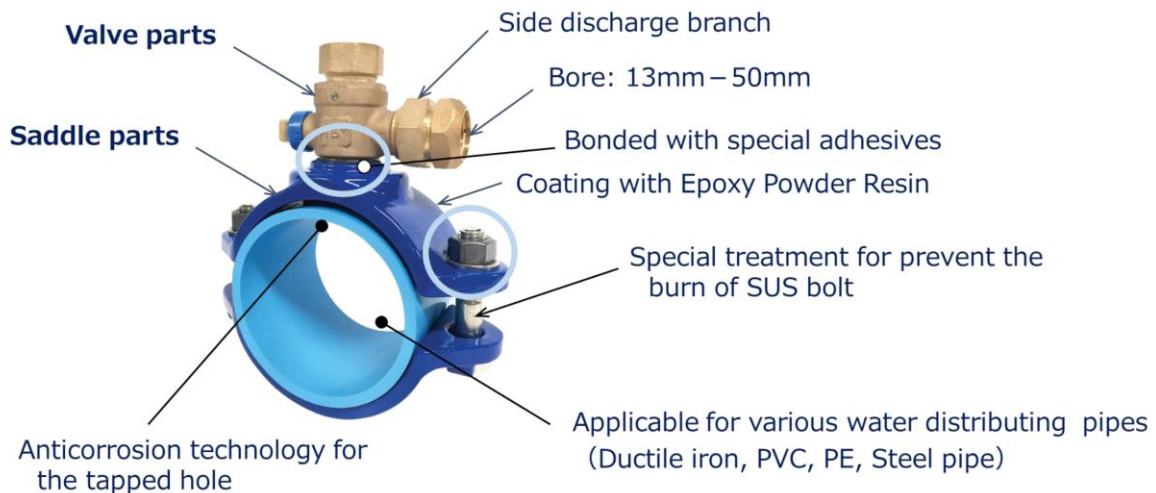
### Specification

- All products are certified by JWWA. (JWWA / Japan Water Works Association)
- used more than 10 million so far in Japan
- Our products have a 50 years service life

**Nearly 80% of water leakage are occurred at somewhere after branch of distribution pipe!!**



## Feature of the Service Saddle of TABUCHI Corp.



**STOP the Water Leakage with TABUCHI !**

TABUCHI CORP.

9 株式会社トーケミ

ANTHRACITE FILTER MEDIA IN THE WORLD



# TOHKEMY



*Trust and experience for 55 years*  
*Total coordinator of water treatment.*

**Anthracite Filter Media from Vietnam**

High quality with high carbon content, quick and direct delivery to your country, long and well experience.

**Filter Media, Chemical Pumps, Mixers, Polymer Dissolvers**

Japanese quality, variable use, long and well experience.

**Order-made**

Engineering the best solutions for water treatment project.



**Local manufacture and assembly**

Challenging to manufacture and assemble unit products locally in Asian countries.

**Local support**

Factory in Vietnam, local agents and distributors, other business partners.

## ANTHRACITE FILTER MEDIA IN THE WORLD



Chemical dosing pump  
(Aluminium, Chlorine, polymer)



Water Quality controller  
(pH, Cl, NTU)



## TOHKEMY CORPORATION

Address: 1-12-11, Tagawakita, Yodogawa-ku, Osaka 532-0021, JAPAN

Phone : +81-6-6301-6460, Fax : +81-6-6308-3022

E-mail : web-master@TOHKEMY.co.jp



## Water Treatment Plant (manufacturing in LAO)



Name: Ban Thong WTP  
 Area: PAXSAN district Bolikhamxay province  
 Resource: Nam Niap (River)  
 Capacity: 1,000t/day (Target: 6,600 people)  
 Start operation: October 2016  
 Remark:  
 High Turbidity water up to 5,000NTU could be treated to drinking water.  
 Supported by JICA verification survey (made in Japan)



Name: Houa Muen WTP  
 Area: Houa Muen village, Savannakhet province  
 Resource: Underground water  
 Capacity: 50m<sup>3</sup>/day (2.5m<sup>3</sup>/hr)  
 Target: 300 people  
 Start operation: March 2017  
 Method: Sand filtration (Iron and Manganese removal) (Φ400mm)  
 (made in LAO)



Werthard village WTP  
 Area: Werthard village, Bolikhamxay province  
 Resource: Underground water  
 Capacity: 240m<sup>3</sup>/day (10m<sup>3</sup>/hr)  
 Supply: 1,600 people 300 houses  
 Start operation: July 2018  
 Method: Gravity type of Sand filtration (backwash water reservoir type) Φ1200mm  
 (made in LAO)



Name: Nasommo village WTP  
 Area: Nasommo village, Bolikhamxay province  
 Resource: Underground water  
 Capacity: 240m<sup>3</sup>/day (10m<sup>3</sup>/hr)  
 Supply: 1,600 people 300 houses  
 Method: Gravity type of Sand filtration (backwash water reservoir type) Φ1200mm  
 Start operation: August 2019  
 Remark:  
 +Supported by Grant Assistance for Cultural Grassroots Projects of Japanese Embassy (made in LAO)



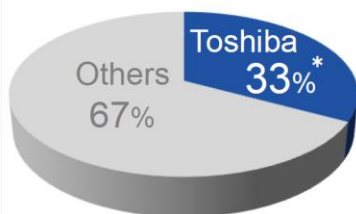
# Toshiba's ozone generator TGOGS™



## Overview

Toshiba first launched an ozone generator in 1976, and we have about 40 years' experience with water treatment systems. Based on this long-term experience, we have accumulated extensive knowhow regarding large-scale ozone generators. We have contributed to improving the drinking water quality in major metropolitan areas (e.g. Tokyo, Osaka, Fukuoka).

**Toshiba has the largest market share in the drinking water treatment field in Japan.**



**Market Share**



Drinking Water Treatment  
(31.0 kg-O<sub>3</sub>/h × 4 sets)



Waste Water Treatment  
(2.0 kg-O<sub>3</sub>/h)



Industrial Plant Treatment  
(1.0 kg-O<sub>3</sub>/h)

\*Based on period from 2000 to 2020, and daily designed water flow of more than 50,000m<sup>3</sup>/d.  
The above figure includes projects under construction.

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# Features of Toshiba's Ozone Generator



## High Reliability

Long life electrode realized by stainless steel film  
(Breakdown rate less than 3% in 10 years)

## High Flexibility and Efficiency

Wide range of capacity and ozone concentrations

### Oxygen Fed

Ozone production : ~120kg O<sub>3</sub>/h  
Concentrations : ~10wt% (Maximum 16wt%)  
Specific energy : 7~8\*kWh/kg O<sub>3</sub>

\*With cooling water inlet temperature of 15°C

### Air Fed

Ozone production : ~50kg O<sub>3</sub>/h  
Concentrations : ~3wt% (Maximum 4.5wt%)  
Specific energy : 14\*kWh/kg O<sub>3</sub>

\*With cooling water inlet temperature of 15°C



## SIPHON TANK Filtration Device Features Internationally Patented SIPHON WASHING SYSTEM

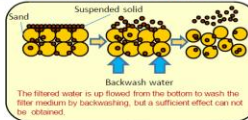


### ■ The basic filtration method Sand Filtration



Rains on the earth penetrates the stratum  
Impurities are trapped by sand and soil, then the water is gradually purified  
Primitive filtration method that has been practiced since ancient times  
**Safe and lasting water production method**  
**Over 80% of water treatment plants adopt sand filtration**

### ■ All filtration processes require filter replacement



The suspended solid trapped by the filter bed is retained in the bed, and when the amount of trapped matter reaches the limit, "backwashing" is performed, in which clean water is returned from the bottom to backwash. However, with water flow cleaning power, suspended solid remains in the bed, and the filter material becomes gradually soiled, and the filter material must be replaced.

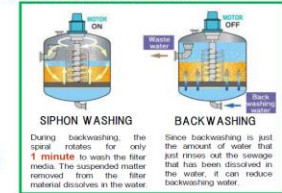
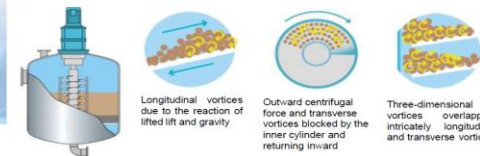
Develop New Water Treatment Device

### ◆ Water Filtration Device without filter media replacement



The "SIPHON TANK" with built-in patented "SIPHON WASHING" function, which has been developed through years of technology accumulation, maintains the filter media in the state of new sand, eliminating the need for filter media replacement for the first time in the world. Reduce backwash water volume and reduce power consumption. **We realized maintenance cost reduction and consideration to the environment.**

#### ◆ SIPHON Washing Principle



#### ◆ International Patent "SIPHON WASHING SYSTEM"

Developed a technology to wash filter media with only water and physical force. Applying the generation process of "Singing sand" that exists only on a beautiful sandy beach, which sounds like a squeak when you step on it, the filter materials are washed with each other on the spiral like the rice by the vertical and horizontal three-dimensional vortices. Because the sands are the same hardness, only the dirt is dropped and the sands are not crushed and damaged.

#### ◆ New age filtration device with built-in SIPHON WASHING

The SIPHON TANK **does not require filter replacement**. The filter media is always kept clean by using SIPHON WASHING together with backwashing every time. **Reduce backwash water volume**. Because the filter media is clean, the water quality is stable, and **the maintenance costs related to filter media replacement and water quality maintenance can be significantly reduced**, and CO<sub>2</sub> emissions can also be reduced.

## BENEFIT of SIPHON TANK

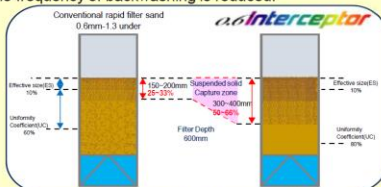


### SIPHON TANK BENEFIT 1

◆ The SIPHON TANK uses the **high performance filter media "Interceptor"** developed by NIHON GENRYO as a standard specification

#### Long filtration duration and low backwash frequency Treatment with high turbidity raw water

The filter (filter material) of the SIPHON TANK uses high performance filter material "Interceptor" developed by NIHON GENRYO. It is a high-quality, high-performance filter media that exceeds the filtration sand standard used in water treatment plants. It functions as a filtration zone up to about 80% of the filtration layer, and compared to the filtration sand used at each water purification plant in Japan (up to about 60% of the filtration layer functions as a filtration zone), turbidity per unit area, the amount of quality trapped is more than doubled, the duration of filtration is extended, and the frequency of backwashing is reduced.



The amount of suspended solid significantly increased by the stereo filtration layer ⇒ **Up to 2.0<sup>※</sup> times**  
The filtration duration can be extended since twice as much suspended matter can be captured in the same area



Suspended solid are spread and removal in deeper suspended solid capture zone of Zebra Layer

**Up to 3.6<sup>※</sup> times**  
※ According to our R&D data

### ◆ Reduce backwashing volume

The amount of suspended solid in the SIPHON TANK is **up to 3.6 times** that of conventional rapid filtration. In addition, since the SIPHON WASHING is used together, the backwashing time per SIPHON TANK is **only 7 minutes**. The backwash flow rate per unit area is reduced **by up to 93%** compared to conventional rapid filtration.

	Unit	SIPHON TANK	Conventional Rapid Sand Filter
		Interceptor w/ zebra layer	Filter sand w/ anthracite
Backwash frequency	Times/day	1	3.4
Backwash time	minutes	7	30
Backwash rate	m <sup>3</sup> /h	42	42
Backwash amount	m <sup>3</sup> /day	34	500
Ratio	%	6.9	100

※ Verification in the case of ST-3000 raw water turbidity 30 NTU/LV = 10 m  
※ The frequency of backwashing depends on the experimental results of our R & D

In the case of ST-3000  
[filtration area 7m<sup>2</sup>(75ft<sup>2</sup>), LV10m(33ft), Capacity1600m<sup>3</sup>/d(422Kgal)], for ST's backwashing flow rate per day is 34m<sup>3</sup>(9Kgal), for conventional filters' 500m<sup>3</sup>/d(132Kgal), which is a **reduction of 466m<sup>3</sup> (123Kgal)[93.1%]**  
It is a reduction 466m<sup>3</sup>(123Kgal) @ 404 JPY(USD3.7)/m<sup>3</sup> = **JPY188,264(USD1,724) /d**

### ◆ Reduce backwash wastewater facility cost and sewer cost

The reduced backwash volume enables **downsizing** of wastewater facilities and reduces operating costs. It also leads to a reduction in sewage rates.

### ◆ Realize direct filtration without pretreatment

The Interceptor and Zebra layer enable direct filtration without the need for pre-treatment flocculation, even with high turbidity raw water. It may **reduce construction cost** of pre-treatment.

※ To be confirmed raw water quality



# Highly Portable, Maintenance-Free Filtration Device Mobile SIPHON TANK ALL-IN-ONE Unit

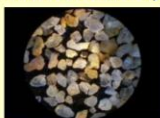


## SIPHON TANK BENEFIT 2

- ◆ Used in combination with SIPHON WASHING during backwashing  
**Filter media can keep it clean**

(No need to replace filter media, costs for replacement work can be reduced)

SIPHON TANK keeps the filter media in the same condition as new sand. No need to replace filter media. It can also reduce the cost of filter replacement work and the cost of industrial waste of filter media that is dirty. Because the filter media is clean, the treated water quality is stable, the time required for facility maintenance can be saved, and maintenance costs can be reduced.



## Maintenance costs can be significantly reduced

No need to replace the filter media and the stainless steel main body significantly reduced the maintenance cost of the main body.  
30 years maintenance cost

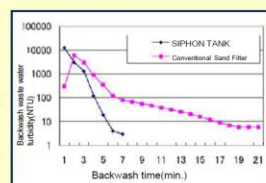
MST-2200	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Capex initial cost (USD)	420,000																														
Capex Maintenance (USD)	0	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	
OPEX (USD)	0	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000	
Total (USD)	420,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	
Cumulative total (USD)	420,000	470,000	520,000	570,000	620,000	670,000	720,000	770,000	820,000	870,000	920,000	970,000	1,020,000	1,070,000	1,120,000	1,170,000	1,220,000	1,270,000	1,320,000	1,370,000	1,420,000	1,470,000	1,520,000	1,570,000	1,620,000	1,670,000	1,720,000	1,770,000	1,820,000	1,870,000	1,920,000
Cumulative difference against MST-SS+Paint	111,000	59,000	7,000	-45,000	-97,000	-149,000	-201,000	-253,000	-305,000	-357,000	-409,000	-461,000	-513,000	-565,000	-617,000	-669,000	-721,000	-773,000	-825,000	-877,000	-929,000	-981,000	-1,033,000	-1,085,000	-1,137,000	-1,189,000	-1,241,000	-1,293,000	-1,345,000	-1,397,000	
0.3000 SS+Paint		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Capex initial cost (USD)	309,000																														
OPEX (USD)	0	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	
Total (USD)	309,000	24,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	78,000	
Cumulative total (USD)	309,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000
0.3000 SS+Paint		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Capex initial cost (USD)	309,000																														
OPEX (USD)	0	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	
Total (USD)	309,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000	102,000
Cumulative total (USD)	309,000	411,000	513,000	615,000	717,000	819,000	921,000	1,023,000	1,125,000	1,227,000	1,329,000	1,431,000	1,533,000	1,635,000	1,737,000	1,839,000	1,941,000	2,043,000	2,145,000	2,247,000	2,349,000	2,451,000	2,553,000	2,655,000	2,757,000	2,859,000	2,961,000	3,063,000	3,165,000	3,267,000	3,369,000

## SIPHON TANK BENEFIT 3

- ◆ Short backwash time with SIPHON WASHING  
**Eco-Friendly Equipment**

Reduce backwashing volume and reduce power consumption

Conventional filtration devices require a large amount of backwash water. However, SIPHON TANK dissolves the dirt of filter media in water beforehand with its own washing and washing, and the backwash water is used to rinse out the sewage in the filter tank. In a short time, the washing wastewater turbidity (dirt degree) decreases, the time for backwashing process can be shortened, and the water volume can also be reduced. Furthermore, this process, which uses a large-capacity pump, is shortened and contributes to the reduction of power consumption and the reduction of CO<sub>2</sub> emissions.



## Greenhouse gas emissions during backwashing Save Power consumption

We will reduce CO<sub>2</sub> emissions from water and sewage to reduce water and sewage usage. It also reduces the operating time of the backwash pump, which consumes the most electricity in the water treatment system, and reduces the CO<sub>2</sub> emissions from electricity. SIPHON TANK is an environmentally friendly filtration device.

CO<sub>2</sub> emissions per day are reduced by 53.1kg-19.6kg = 33.5kg. Annual reduction of 10,050 kg 10 t-CO<sub>2</sub>

CO <sub>2</sub> emissions per day at reduced water pumping (ongoing)				Siphon Annual reduction	
	CO <sub>2</sub> emission factor	CO <sub>2</sub> emissions		SIPHON TANK	Conventional
		SIPHON TANK	Conventional		
Portable water	200(g-CO <sub>2</sub> /m <sup>3</sup> )	26m <sup>3</sup>	5,200g	70m <sup>3</sup>	14,000g
Sewerage water	437(g-CO <sub>2</sub> /m <sup>3</sup> )	26m <sup>3</sup>	11,362g	70m <sup>3</sup>	30,590g
Backwash pump		22kWx7min	1,260g	22kWx20min	3,600g
Drainage pump	491(g-CO <sub>2</sub> /m <sup>3</sup> )	11kWx19min	1,710g	11kWx55min	4,950g
SIPHON motor		11kWx1min	90g	-	0g
Sum			19.6kg		53.1kg

※ Quoted Tokyo Olympic ST-3000 project materials

※ Verification in the case of ST-2200, raw water turbidity 30 NTU LV = 10 m

By increasing the amount of suspended solid collected and reducing the frequency of backwashing, the amount of electricity and chemicals used per unit water can be reduced by up to 40% and 34%.

## SIPHON TANK BENEFIT 4

- ◆ Movable filtration device Mobile SIPHON TANK

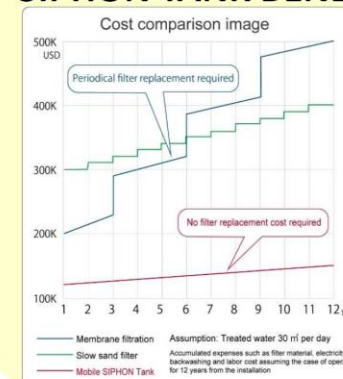
Mobile SIPHON TANK applies to sustainable drinking water supply and waste water treatment. This unit is designed compact size and unified with SIPHON TANK, piping, valves, chemical dosing unit and control panel. So that it is easy to transport, assemble onsite and operate simply. Since this is a movable unit, it provides drinking water anywhere and anytime **incase emergency like disaster relief**. It is needed and set as a temporary type or permanent type as well. Moreover, as SIPHON WASHING system is installed inside of the tank, filter is always clean, and therefore, it is achieved quality water supply and maintenance-free. **MST can be flexibly adapted as a water treatment plant for small to medium-sized water supply.**



## SIPHON TANK BENEFIT 5

- Excellent economic efficiency for installation and maintenance

It is assumed that the throughput per day is 30m<sup>3</sup>. Assuming 12 years of operation from the introduction, we compared filter media (or membrane filter), electricity, backwashing, chemicals, labor costs, etc. in the case of membrane filtration, slow filtration, and Mobile SIPHON TANK. Membrane filtration requires regular filter replacement, consumes a large amount of electricity, and is susceptible to high turbidity, iron and manganese removal. Mobile SIPHON TANK is highly resistant to turbidity, iron and manganese removal, does not require replacement of filter media, consumes less electricity, and can reduce maintenance costs.



Nihon Genryo Co., Ltd. is a specialized manufacturer of filter media, founded in 1939. 80% of water purification plants in Japan use our filter materials. Today, we are actively implementing filter media recycling at water purification plants in order to leave raw filter materials for our next generation.

## 12-1 フジテコム株式会社 FUJI TECOM.INC

### FUJI TECOM.INC

We, Fuji Tecom Inc., are contributing to development of the instruments for water network in the world as a pioneer of water leak detection technology for 60 years. We are a leading manufacturers and exporters for the instruments of the water facility management, and its technology. At present, we have 38 distributors in the world, and they are introducing and sell Fuji products by our support. Also, we provide a study and training of our instruments to engineers at Fuji Technical Development & Training Center. Furthermore, we are working in order to support the countermeasures to Reduction of Non-Revenue Water (NRW) for waterworks network, and we are also involving in JICA projects over the world for reduction of NRW.

Under the circumstances, through dedicated effort to seek ongoing improvements in the technologies and quality of its products and services, we are committed to achieving higher levels

of the customer satisfaction with customer services and innovation instruments.

We are contributing towards improvement of living standards of water worldwide.

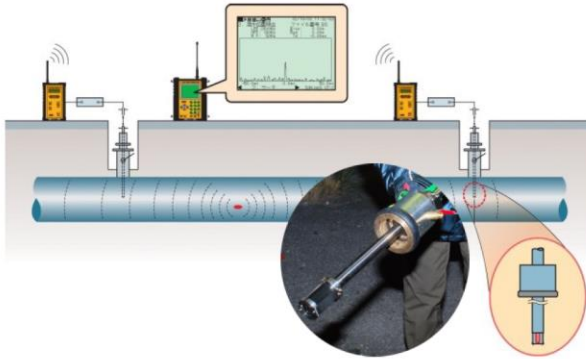
### Leak Noise Logger System LNL-1



The number of domestic waterworks bureau in use of LNL-1 exceeds 100 bureaus, and it is installed at more than 20,000 places annually. In Kawasaki city, we are undertaking the surveillance type water leakage survey as outsourcing for monitoring continuous water leakage, and contribute to efficient pipeline maintenance.



## Water Leakage Survey Method for Large Diameter Pipe



We developed high sensitivity insertion type submersible microphone sensor, and we have a track record in domestic and overseas by large diameter pipe water leakage survey method. In addition to drastically reducing external noise, it can also suppress the attenuation of leakage noise, and the sensitivity has improved about 10 times compared with the conventional pipe-wall type sensors.

## Training course for maintenance of water facilities

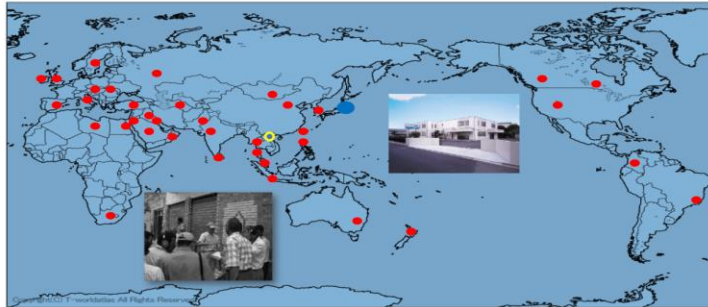


Fuji Technical Development & Training Center with underground water pipeline facilities has become one of excellent training site not only in Japan but also in the world. Most of engineers not only from Japan, but also Europe, Middle-East, Africa, South America and Asia have been receiving training at our Training Center.



## 12-2 フジテコム株式会社

Fuji has been supporting the industry for over 50 years



We are contributing to development of instruments using at water facility as a pioneer of water leak detection technology for 60 years.

We are a leading manufacturer of the equipment for Non-Revenue Water Reduction, and its technology.

We have 40 distributors all over the world and are also involving in JICA projects for reduction of N.R.W.



*Fuji has been supporting the industry for over 50 years*



**DNR-18:**  
**Digital Water Leak Detector**



**LDR-20:**  
**Water Leak Detector**



**HG-10AII:**  
**Water Leak Detector**



**NPL-100: Non-metal Pipe Locator**



**PL-G: Pipeline and Cable Locator**



**F-90M: Metal Locator**



**FSB-8D: Digital Sound Detector  
&  
Listening Stick**



**LNL-1:**  
**Leak Noise Logger System**



**Lapon Company Limited**  
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Vientiane Capital, Lao P.D.R  
Tel : (+856) 21 - 261095  
Mobie:(+856)020-5437-5462  
Mail:thongkham@hotmail.co.jp

### 13 メタウォーター株式会社

#### Mobile Ceramic Membrane Filtration Equipment



Item	Content
<b>Technology</b>	Water treatment membrane
<b>Entity Name</b>	METAWATER Co.,Ltd.
<b>Technologies</b>	Mobile Ceramic Membrane Filtration Equipment
<b>Summary</b>	Mobile water purification system using ceramic membrane loaded onto a truck. It enables filtration of high turbidity raw water available in the event of disaster. No chemical to prevent deterioration in quality is required while storing ceramic membranes in a long period of time. Operation has no problem at places where there is no power source available, because a generator stands by in a truck.
<b>Diagram(s)</b>	
<b>Details</b>	<p><b>【Application】</b> Filtration of raw water and supply of potable water to rural areas where there is no water purification plant as well as to areas suffering so much inconveniences due to a disaster such as flood, etc.</p> <p><b>【Characteristics】</b> The characteristics of the system are as follows.</p> <p>(1) Ceramic membrane which has a longer life span over 15 years, can filtrate high turbidity raw water to remove protozoa such as cryptosporidium and bacteria such as E coli.</p>

	<p>(2) No chemical is required while storing ceramic membranes in a long period of time.</p> <p>(3) No sedimentation basin is required, therefore, configuration of the system becomes simple. The O&amp;M is also simple because replacement of membrane does not happen for such a longer period of time.</p> <p><b>【Effect】</b> The system can filtrate high turbidity raw water to supply the following volume of drinking water according to the number of membrane elements used.</p> <p>(1) One element system : (Ground water : 1~4 m<sup>3</sup>/hr., Surface water : 1~2.5 m<sup>3</sup>/hr.)</p> <p>(2) Two elements system : (Ground water : 2~8 m<sup>3</sup>/hr., Surface water : 2~5 m<sup>3</sup>/hr.)</p> <p>(3) Four elements system : (Ground water : 4~16 m<sup>3</sup>/hr., Surface water : 4~10 m<sup>3</sup>/hr.)</p>
<b>Accomplish-ments</b>	<p>3 units to Malawi (delivered in January 2013)</p> <p>2 units to Kenya (delivered in May 2013)</p> <p>3 units to Togo (delivered in April 2014)</p> <p>4 units to Lesotho (delivered in June 2014)</p> <p>1 unit to Cote d'Ivoire (delivered in January 2015)</p> <p>1 unit to Cambodia (delivered in April 2014)</p> <p>10 units to Myanmar (delivered in November 2017)</p> <p>1 unit to Madagascar (delivered in February 2020)</p>
<b>URL</b>	<a href="https://www.metawater.co.jp/eng/news/2019/03/post-254.html">https://www.metawater.co.jp/eng/news/2019/03/post-254.html</a>
<b>Contact Information</b>	<p>Company Name: METAWATER Co.,Ltd.</p> <p>Department: International Sales &amp; Marketing Department, International Business Division</p> <p>Person in charge : Taku ASANO</p> <p>E-mail Address : asano-taku@metawater.co.jp</p>



## YOKOGAWA contribute Sustainable Water Management

In the future, water demand is expected to increase along with further population growth and economic development around the world. In order to make efficient and effective use of the limited water resources that are indispensable for sustaining life, we would like to introduce solutions for sustainable water supply management, looking further ahead to 2030, the target of the SDGs.



### ■ What does YOKOGAWA think is necessary for sustainable water management?



Water supply is an important infrastructure that supports the lives and social activities of citizens. Therefore, water supply facilities are required to operate stably for a long period of time.



In emerging and developing countries, Non-Revenue Water (NRW) is an issue in water supply management; reducing NRW and improving revenues will improve water supply management.



Transferring technology and fostering the human resources who will be responsible for the water supply infrastructure are important elements of sustainable water management.

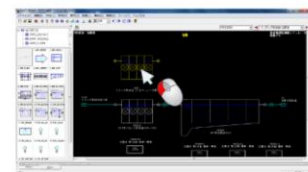
**-DCS (Distributed Control System)  
with 99.99999% uptime  
-Reliable and robust Sensors**



**-WLMS (Water Loss  
Management System)  
-High accuracy sensors**



**-Operation Training Simulator**



### The foundation for sustainable water supply operations is a global service network.

Yokogawa has a Global Response Center that is available 24 hours a day and a Regional Response Center that can respond to local languages to support customers' safe and secure operations. The company also has permanent training centers in various locations where customers can receive training in operations and engineering.

## YOKOGAWA contribute Sustainable Water Management

### Reliable Monitoring and Control system and Instruments



Yokogawa's DCS "CENTUM VP" has the world's highest level of reliability, and its systems are in operation all over the world. We have DCS that are suitable for controlling water treatment plants and for monitoring water distribution network, as well as highly robust flow meters and pressure sensors. Our unstoppable and unbreakable products ensure sustainable operations.



### Water Loss Management System for Non Revenue Water Reduction



If NRW is high or it is difficult to be reduced even after repair of leakage pipe, IWA methodologies are useful and effective. Yokogawa supplies WLMS using IWA methodologies,

our WLMS provided the following functions for NRW reduction.

- Water Balance: Analysis of water supply and NRW
- Night Flow Analysis: Detection of new water leakage
- Pressure Management: Calculation of optimal water pressure

Our WLMS can analyze measurement data

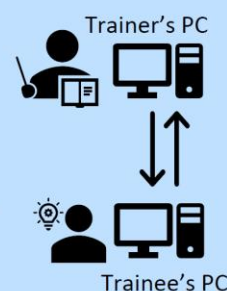
and help your water management to be more efficient.



### Supporting Efficient Operator's Training using Dynamic Simulator



OTS (Operator Training Simulator) using a dynamic simulator, provides training not only for normal operations, but also for emergency situations such as high turbidity raw water inflow due to guerrilla rains or power outages through simulations. The characteristics of each water facility can be reflected in OTS, so the training can be closer to practical use. This makes it possible to train operators and pass on skills.



### Who is YOKOGAWA?

Yokogawa is a Japanese company with over 100 years of history, with strengths in control, measurement and information. It supports a wide range of industries, including not only water and sewage, but also petroleum, chemical, and food industries. The company has 230 service bases in 80 countries around the world and contributes to the optimal operation .