

## "Model of New Water Supply"

~ Optimum for Small & Medium-scale Waterworks ~

13/Nov./2019 NIHON GENRYO CO., LTD.



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## **Company Profile**

**⊘** Company Name : NIHON GENRYO CO., LTD.

**⊘** President : Yasuhiro SAITO

**⊘** Establish : 1939 (80 years old)

**⊘** Capital / Employee : JPY 98M / 72 person

**⊘** Patent : Over 100 (as of 2018)

**⊘** Location : HQ/ Kawasaki

**Branch/Osaka** 

Sales Office/ Sapporo, Sendai, Takahagi,

Nagoya, Fukuoka

Factory/ Takahagi

**⊗** Business : 1. Filter Media Manufacturing

2. Filter rehabilitation work

3. Cutting Edge Water Treatment Devise

"SIPHON TANK & Mobile SIPHON TANK"





## 1. Filter Media

## **JWWA Certified Factory**



Our TAKAHAGI Plant is a certified factory, which is evaluated to conform to the evaluation standards of products and quality control system from the Japan Waterworks Association (JWWA) Quality Certification Center.

# We are a manufacturer of Filter Media established in 1939, our media is used more than 80% of WTP in Japan

More than 80% of drinking water in Japan passes through filter media of NIHON GENRYO. We manufacture and supply variety of filter media in conformity with Japan Water Works Association (JWWA) regulation. We use experience of 80 years and cutting-edge technology to manufacture our filter media.





Sand filter cross section



## Why performance of the filter media is getting worse?

## Mechanism of filter media covered by sludge

Daily maintenance

Backwashing, Surface washing, Air washing

Hard to remove whole sludge

Sludge accumulated on surface

Attached sludge growing harden firmly

Adhesive Sludge accumulated on surface

Filtration performance become worth by the bigger particle size



New sand



Sludge attached to surface



Sand covered by sludge



Attached sludge harden firmly and change to "Hard sludge" ⇒Accumulated sludge



Filter media change required every 7 to 10 years.



(New Sand)

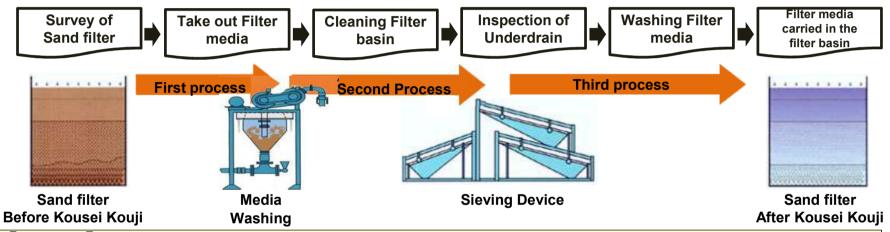


(Used Filter media)



## 2. Filter rehabilitation works

Regularly perform rehabilitation work instead of replace media to stabilize the normal filtration function



#### (Benefit)

- © Recover filtration function and enable to supply safe and sustainable water

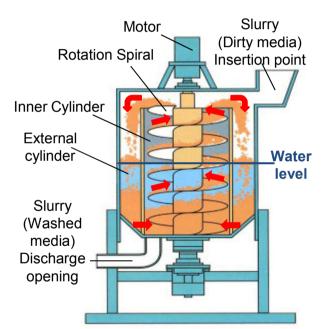
NIHON GENRYO started Filter rehabilitation works for resource protection since 60 years ago in Japan.





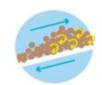
## **Develop Original Washing technology "SIPHON Washing"**

#### **Structure of SIPHON Washing machine**



Filter media is moved to arrow direction and washed by circulation

## Principle of Filter Washing



Vertical vortex is created in each sand grain by gravity and scooping up force



Horizontal vortices are created by centrifugal force and blocking by inner cylinder



3D vortex
The vertical and horizontal
vortexes make sand particles to
be kneaded each other in a three
dimensional washing action



Generation process of Singing Sand

Create Vertical vortex by gravity and scooping up force

#### Create Horizontal vortex

by centrifugal force and blocking by inner cylinder

Ш

**Create** 

3D vortex



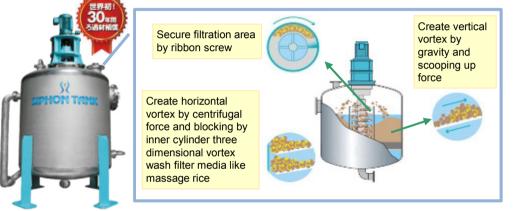
#### SY SIPHON TANK

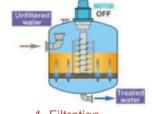
### 3. "SIPHON TANK"

Filtration device "SIPHON TANK" installed SIPHON washing technology with no filter

media change required.

 Ø Resilient to high turbidity raw water





#### 1. Filtration

As with conventional filtration systems, filtration is conducted by down flow with pressure.



#### 2. Backwashing

Backwashing is first conducted for a short period of time to fluidize filter media, and then SIPHON cleaning is conducted



#### 3. SIPHON washing

Filter media is washed by kneading with the upward force that pushes water and filter media up from the lower part to the upper part by the rotation of the screw and the downward force generated by gravity



#### 4. Backwashing

After SIPHON washing, backwashing is conducted to drain away washing water. Sludge is completely exfoliated from filter media to which SIPHON washing was applied, so sludge can be easily rinsed.



## **High Performance Filter Media**

#### o.olnterceptor

Filter sand depth 600mm
0.6mm×1000 grain
(Thousand stage filtration theory)

**⊘** Development Concept

Utilize the effective part of the filtration layer as maximum (60%⇒80%)

Significant increase in amount of suspended solid captured by stereo filtration layer

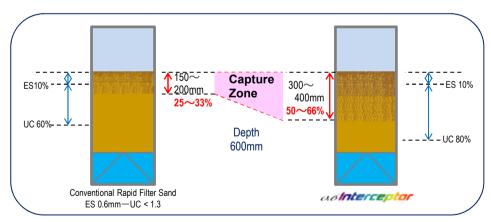
More than 2 times (Suspended solid capture amount max. 2.3 times)

**Surface filtration** 



**Depth filtration** 

■ Stratification of conventional filter sand Grain size going big from surface to down layer











Zebra Layer with Interceptor

Up to 2.7 times (SCA 3.5 times)

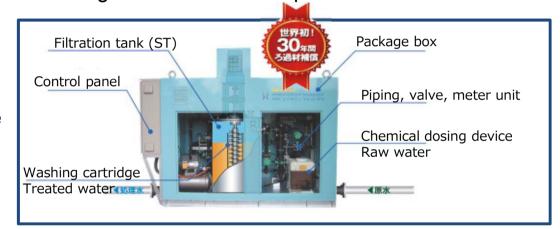


## Movable filtration device "Mobile SIPHON TANK"



Mobile SIPHON TANK is unitized movable water treatment device install filtration tank, piping unit, washing cartridge, chemical dosing device and control panel.

- **⊘** Disaster recovery
- Turbidity treatment at construction site
- Ø Around 3 days from install to water supply





Installed MST by disaster-relief and continuously using as WTP



Drinking water supply at disaster



Transportation by truck



Truck mounted type MST





# Our proposing model of New Water Supply

for Small & Medium scale Waterworks
With Mobile SIPHON TANK (MST)



Disaster Recovery 2018 in JAPAN and New Water Supply Model 

Millon GENRALDO

Millon GENRA







## Record of disaster recovery in LAOS 2013







**Tempest hit the south of Lao** People's Democratic Republic from September 18 to 24, 2013 and caused flooding damage to Saravahn Province. Truck mounted type water treatment unit "Mobile SIPHON TANK", deployed at Sekong Province, was sent to affected area for support water supply. Drinking water was supplied for 10,573 households (67579 people) there from September 22 to 29, 2013. Also Oudomxay Province, northen part was damaged by flood in August 2013. "Mobile SIPHON TANK" stationed at Luang Prabang Province was sent to affected area and supplied drinking water for 1,529 households (8,741 people) there.













## Record of disaster recovery in Philippines 2013





Huge typhoon "Yolanda" hit central Philippine on November 8<sup>th</sup>, 2013 and caused tremendous damage to Leyte island and its surroundings. Japan International Corporation Agency (JICA) requested NIHON GENRYO to support area affected by disaster. NIHON GENRYO dispatched 7 peoples to "Daanbantayan" from December 19 to 30, 2013 and supplied drinking water with water treatment device "Mobile SIPHON TANK" as requested by JICA. Drinking water was supplied for 4,000 households (20,000 people) there from December 28<sup>th</sup>, 2013, which is only 3 days after installation.









**Treated water** 



Only 3 days after starting installation

## Record of disaster recovery in Japan 2018







July,2018 torrential rain hit entire West Japan. It caused tremendous damaged to the lifeline. NIHON GENRYO WATER RESCUE team was sent to Uwajima-city as requested by government and the municipality. Seven units of Movable water treatment device, Mobile SIPHON TANK, were delivered there with Japanese self-defence forces support. These provided the water for total volume of 4,100 m3 per day and supplied it to 6,500 households, which means 15,000 people.









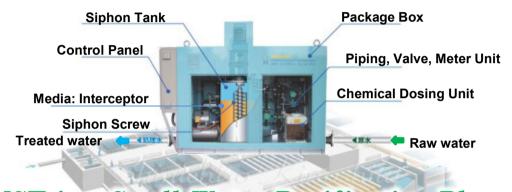


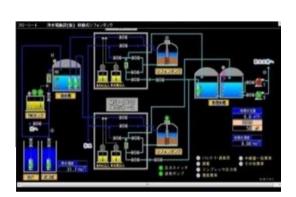
Start water supply 4,100 m3/day in just 15 days after installation



## We implement ideal of waterworks by MST









MST is a Small Water Purification Plant

Remote monitoring is option

- **ODISPERSION TYPE WATER SUPPLY WITH ADMINISTRATION OF SOURCE**No. 10 April 10 April
- **Solution** Respond to population trend due to integral unit combination >> Flex-response
- **Second Second S**
- **☑** Easy operation and maintenance >> No Filter Media Change & Save BW water
- **Enable to transport to disaster area >> Easy Set-up & Quick response**





# Thank you very much





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Challenge through Water, for future, for human life

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