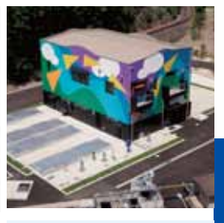


Water


Food





Kubota Continues Support for Global “Food, Water and Environment” Now and in the Future

Kubota’s more than 100 years of history has been one of facing up to social challenges. Our commitments–Creating a better social foundation and Supporting people’s day-to-day lives–have never changed from our establishment until today, more than 100 years later.

“For Earth, For Life”

Kubota will continue making every effort to support people’s smiles and rich day-to-day lives in the future by contributing globally to addressing common issues we all face:

“Food,” “Water,” and “Environment.”



Environment





Johkasou Business Unit, KUBOTA Corporation

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For Earth, For Life

Kubota

Kubota FRP Johkasou, Wastewater Treatment Plant

The Pinnacle of Water Treatment Technology

KZII-5

KM-SG-NP

Plant Package

Kubota's advanced water treatment technology now delivered in a package

To meet water treatment requirements, we, Kubota commit to offer the most optimal water treatment solutions by utilizing all our technologies and know how. That is our mission as one of Kubota, a leading player in the global and Japan water treatment markets. Kubota now unveils a package incorporating its advanced water treatment engineering expertise, which has been refined through many years of experience in building water treatment plants. Optimal water treatment solutions are available in locations and in sizes customers require. Kubota's "plant package" is sure to serve as the key concept of combined wastewater treatment tanks. Customers who are dedicated to building environmentally friendly communities and lifestyles befitting the 21st century choose Kubota tanks.

Environmental Technology | Water Treatment and Hydraulics | Craftsmanship

Kubota FRP Johkasou, Wastewater Treatment Plant

Small-size Johkasou

This wastewater treatment tank is designed for individual homes and vacation homes to small-scale stores and apartment buildings. It is a standard product.

KZII

Flow rate	Effluent water quality
1.0～2.0(m³/day)	BOD 20mg/L T-N 20mg/L

Moving bed contact aeration circulation method

HCZ

Flow rate	Effluent water quality
2.8～10.0(m³/day)	BOD 20mg/L T-N 20mg/L

Sedimentation-separation anaerobic filter moving bed process

Large-size Johkasou

This wastewater treatment tank can be adapted to various uses, including large-scale plants, public facilities and apartment buildings. It is custom-made according to the facility's demands.

Membrane Bioreactor Type

Kubota's wastewater treatment tanks are used to preserve the environment in areas where sewage systems are rarely installed. Specifically, this is Kubota's proprietary membrane bioreactor system,where a highly-concentrated activated sludge system is coupled with submerged fine-pore membranes to perform advanced water treatment. Treated water can be reused, without post-treatment, as flush water for toilet and spray water.

KM-SG-NP

Flow rate
5.1～(m³/day)

Effluent water quality
BOD 5mg/L, COD 10mg/L, T-N 10mg/L,T-P 1mg/L

Moving Bed Media Filter Type

This type of wastewater treatment tank constitutes a compact water treatment system. Since this type of tank adopts a moving bed media filter system and incorporates a flow volume control function, it is able to perform stable water treatment for condominiums, stores, plants, and other large-scale buildings.

K-HC-T

Flow rate	Effluent water quality
10.0～30.0(m³/day)	BOD 20mg/L

Peak-cut flow solid-liquid separation anaerobic filter moving bed media filter process

K-HC-R

Flow rate	Effluent water quality
20.0～(m³/day)	BOD 20mg/L

Flow equalization-type moving bed media filter process

Kubota's Refined Expertise Catapults Clean Technology to the Next Stage

■ **The pinnacle of water treatment technology, demonstrating highly advanced and stable water treatment performance**

Submerged Membrane

Submerged Membrane® is a patented technology that has been achieved through the combination of Kubota advanced water treatment technology and its unique membrane technology.

Membrane Bioreactor System

Applicable Products | Model KM-SG-NP

Removal of T-N, T-P

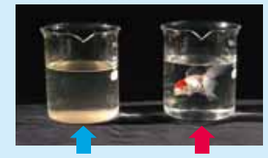
Since it processes high-concentration activated sludge, it is easily possible to remove not only organic pollution such as BOD, but also Nitrogen. Phosphorus can be removed through direct coagulant dosing into the nitrification tank.

Compact installation space

Since it processes high-concentration activated sludge, no sedimentation tank or sludge thickening tank is required. Installation space can be designed 30～60% smaller compared with conventional systems.

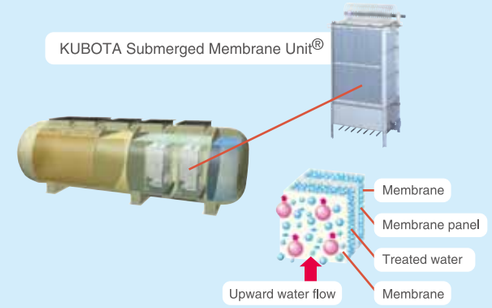
Reusable treated water

Since treated water is discharged through small membrane pores (0.2 μm), treated water is stable and with high quality effluent. Most microorganisms cannot pass through the membrane, so treated water can be reused without the high-treatment facilities.



KUBOTA Submerged Membrane Unit®

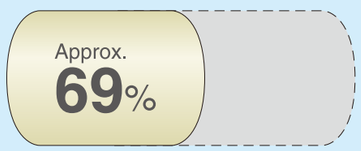
The KUBOTA Submerged Membrane Unit® incorporates microporous membranes made from polyolefin. Although fluids smaller than the membrane's micropores can permeate the membrane, contaminated ingredients cannot permeate it due to their larger size. Furthermore, contaminants are pulled to the membrane surface. Water flow created by aeration, and air bubbles contact the membrane's surface and move upward while vibrating the surface. This keeps the membrane surface always clean and prevents the micropores from clogging.



■ **Reducing tank size and stabilizing water treatment at the same time means lower construction costs**

Reduction of size

Achieving highly reduction of size by using sponge media and optimisation of design.

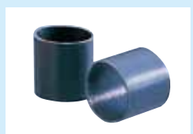


Example of size reduction

Media flow filter method

Achieving highly efficient treatment with moving bed media

The moving bed tank employs a sponge media that is highly capable of retaining microorganisms.



Filter media
Smooth-surfaced cylinder
(φ14-16 × 15 mm)

Sponge media
(20 × 20 × 20 mm)

Kubota FRP Johkasou, Wastewater Treatment Plant 【Small-Size Johkasou】

Moving bed contact aeration circulation method

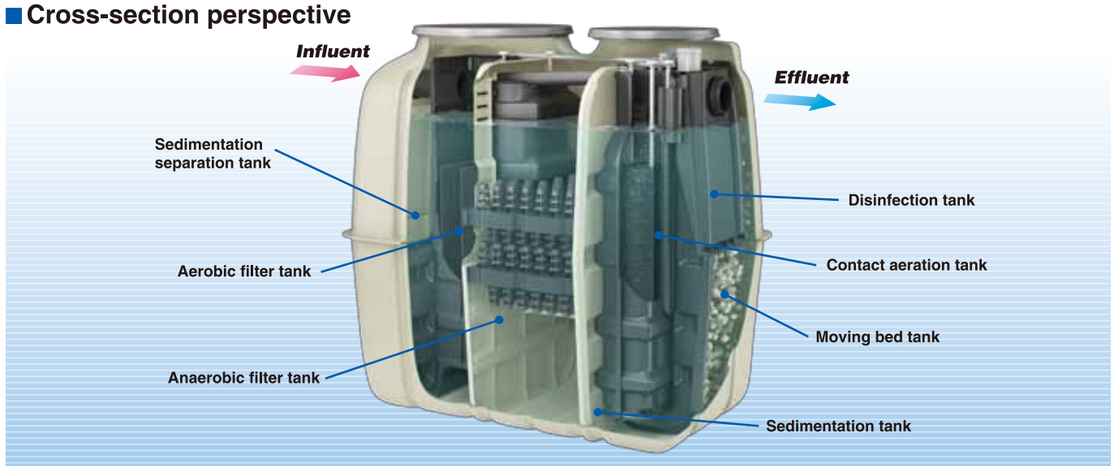
KZⅡ

Flow rate (m³/day) 1.0 ~ 2.0

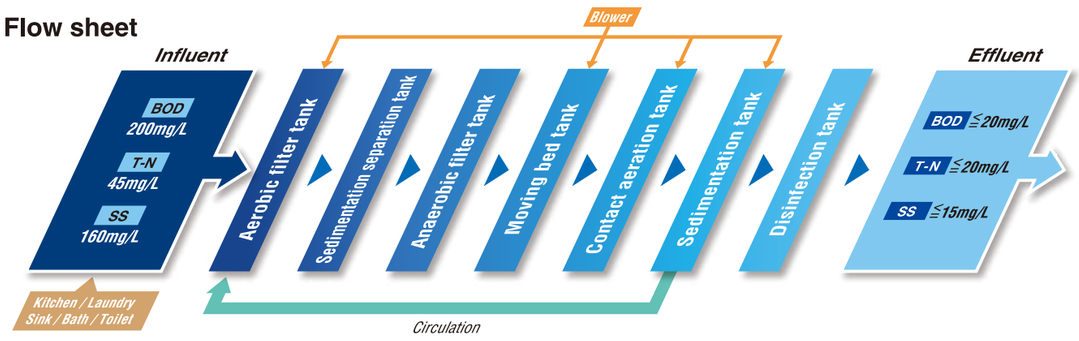
N removal

- One more step in space-saving installation
  The tank in itself is the smallest design in the world. It can be built without having to choose a place, and even with a small excavation space, it will be labour-saving and make construction quicker.
- All-in-one air-piping unit blower without timer

Cross-section perspective



Flow sheet

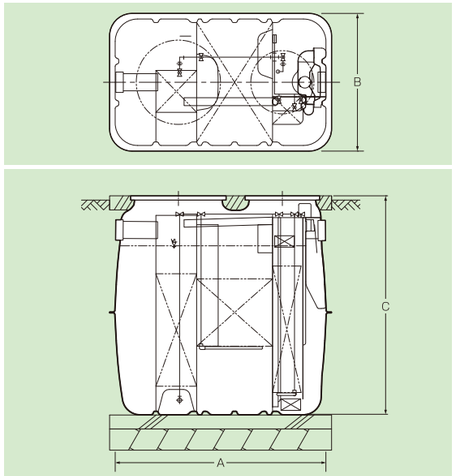


Specifications (inf. BOD 200 mg/L)

Model		KZⅡ-5	KZⅡ-7	KZⅡ-10
Flow rate (m³/day)		1.0	1.4	2.0
Dimensions (mm)	Length A	1,580	2,120	2,790
	Width B	980	980	1,200
	Height C	1,560	1,560	1,580
Manhole number	ϕ450	1	3	2
	ϕ600	1	–	1
Inf.eff.pipe dia. (mm)		ϕ100		
Air pipe dia. (mm)		ϕ13		
Capacity (m³)	Aerobic filter tank	0.105	0.146	0.208
	Sedimentation separation tank	0.432	0.605	0.850
	Anaerobic filter tank	0.528	0.738	1.053
	Moving bed tank	0.205	0.285	0.428
	Contact aeration tank	0.040	0.056	0.081
	Sedimentation tank	0.083	0.112	0.579
	Disinfection tank	0.015	0.015	0.023
	Total capacity	1.408	1.957	3.222
Blower air flow rate (L/min)		60	80	120

Drawing example

(mm)



Kubota FRP Johkasou, Wastewater Treatment Equipment 【Middle-Size Johkasou】

Sedimentation-separation anaerobic filter moving bed process

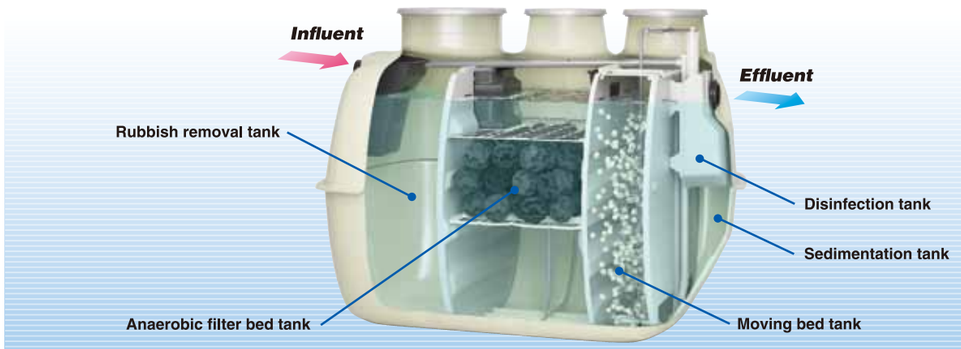
HCZ

Flow rate (m³/day) 2.8 ~ 10.0

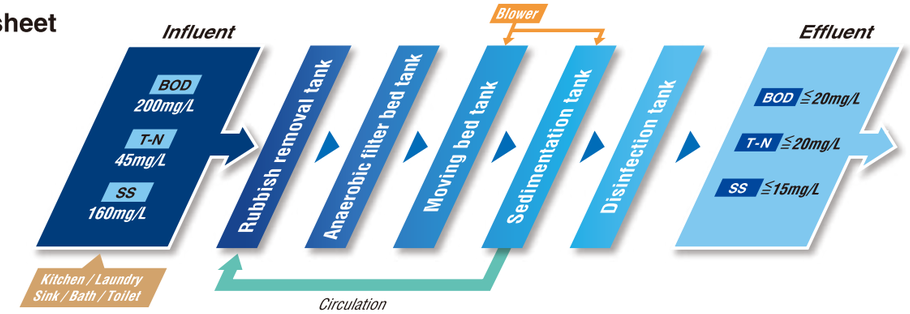
N removal

- Excavation and construction cost are reduce due to the compact design of FRP tank.
- It is easy to install the connection pipe from blower to FRP tank due to one line.
- It is easy to maintain due to the simple system & simple structure inside FRP tank.

Cross-section perspective



Flow sheet

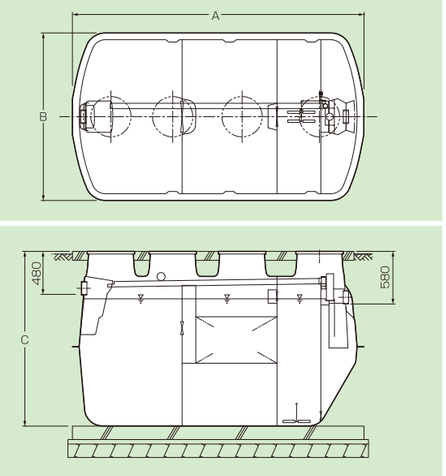


Specifications (inf. BOD 200 mg/L)

Model		HCZ-21	HCZ-30	HCZ-40	HCZ-50
Flow rate (m³/day)		4.2	6.0	8.0	10.0
Dimensions (mm)	Length A	3,255	3,685	4,780	5,760
	Width B	1,870	2,000	2,000	2,000
	Height C	1,950	2,180	2,180	2,180
Manhole number	ϕ450	4	1	2	2
	ϕ600	–	2	2	2
Inf.eff.pipe dia. (mm)		ϕ100			
Air pipe dia. (mm)		ϕ20			
Capacity (m³)	Removal for trash tank	2.366	3.395	4.503	5.626
	Anaerobic filter bed tank	2.372	3.380	4.509	5.626
	Moving bed tank	1.082	1.542	2.054	2.570
	Sedimentation tank	0.481	0.737	1.046	1.046
	Disinfection tank	0.044	0.078	0.105	0.105
	Total capacity	6.345	9.132	12.217	14.973
Blower air flow rate (L/min)		150	200	300	350

Drawing example

(mm)



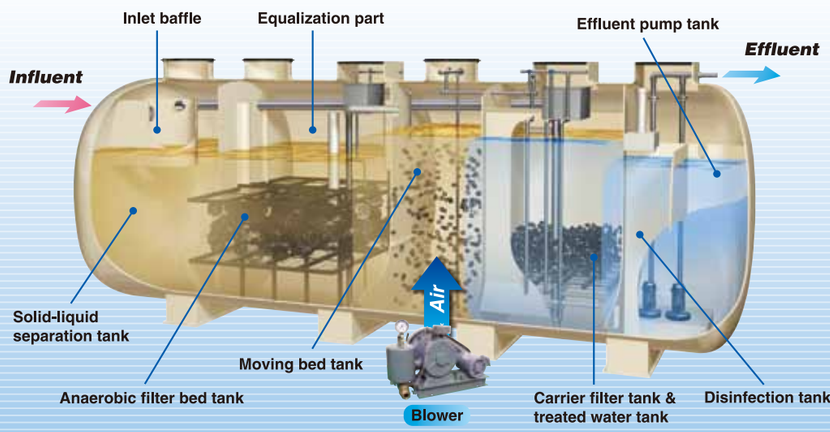
Peak-cut flow solid-liquid separation anaerobic filter moving bed media filter process

K-HC-T

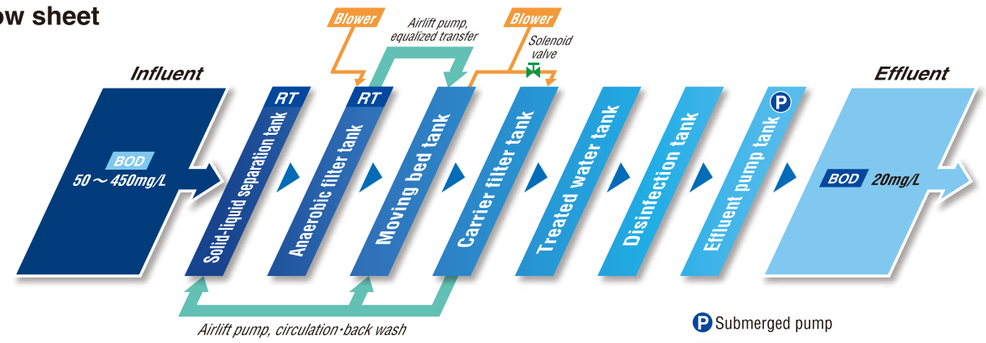
Flow rate (m^3/day)
10.0 ~ 30.0

- Capable of handling up to 148 persons (29.6 m^3/day) with one tank
- The capacity of the solid-liquid separation tank can be increased as a customization measure against high BOD load wastewater.

Cross-section perspective



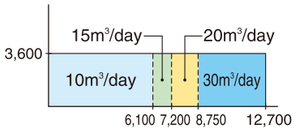
Flow sheet



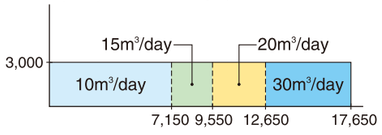
Specifications (inf. BOD 200 mg/L, influent 12 hrs/day)

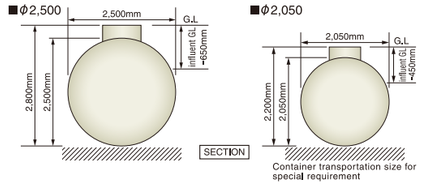
Flow rate	m^3/day	10	15	20	30
Tank size (ϕ2,500 x 2,800H)	L (mm)	5,500	6,600	8,150	7,650+3,950
Rated power (380V)	kW	1.20	1.20	1.55	1.55
Tank size (ϕ2,050 x 2,200H)	L (mm)	6,650	9,050	7,800+3,850	8,325+8,325
Rated power (380V)	kW	1.55	1.55	1.55	2.30

● Size (mm) : In case of ϕ2,500



● Size (mm) : In case of ϕ2,050





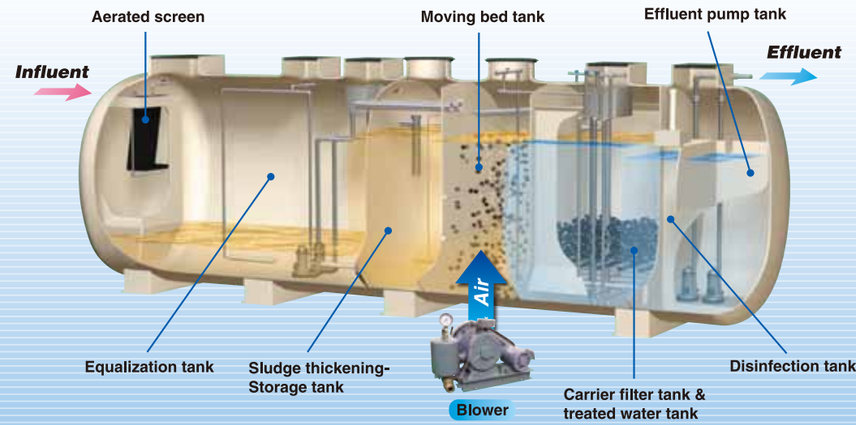
Flow equalization-type moving bed media filter process

K-HC-R

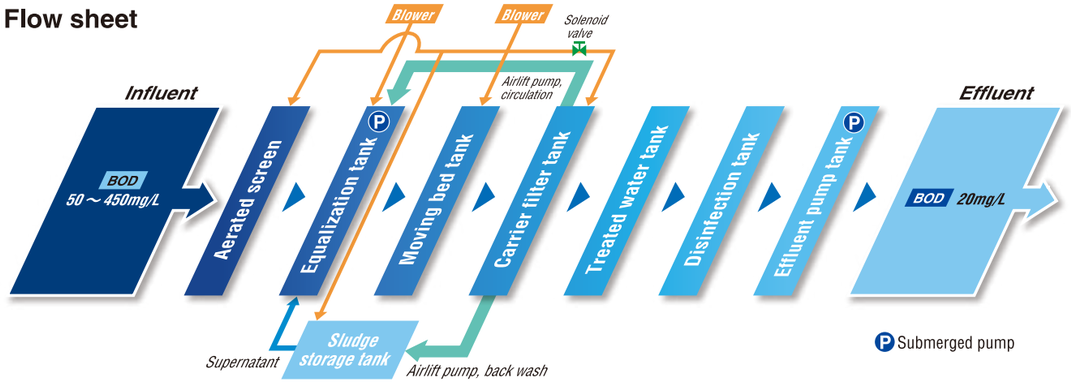
Flow rate (m^3/day)
20.0 ~

- Achieves stable treatment with the flow control function + moving bed carrier filter process
- Adaptable to various building applications by changing the flow control ratio

Cross-section perspective



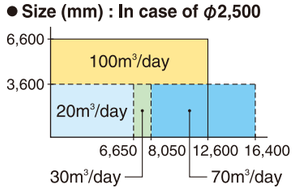
Flow sheet



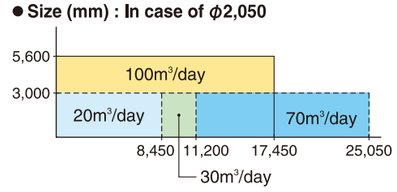
Specifications (inf. BOD 200 mg/L, influent 12 hrs/day)

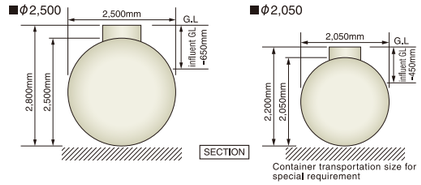
Flow rate	m^3/day	20	30	70	100
Tank size (ϕ2,500 x 2,800H)	L (mm)	6,050	7,450	7,250+8,050	10,000+6,100+5,400
Rated power (380V)	kW	2.55	2.55	3.40	3.50
Tank size (ϕ2,050 x 2,200H)	L (mm)	7,950	10,700	4,150+9,650+9,650	9,200+10,650 +5,850+ 7,250
Rated power (380V)	kW	2.55	2.55	4.55	4.55

● Size (mm) : In case of ϕ2,500



● Size (mm) : In case of ϕ2,050





Kubota FRP Johkasou, Wastewater Treatment Plant 【Large-Size Johkasou】

Membrane bioreactor (MBR) process

KM-SG-NP

Flow rate (m^3/day) 5.1~

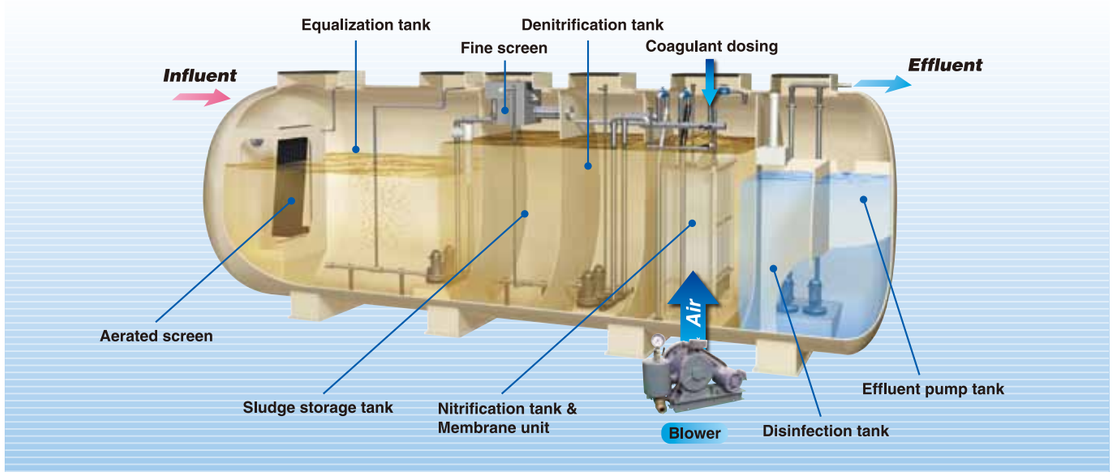
N/P removal

- Capable of removing nitrogen and phosphorus by means of membrane separation + recycling-type high concentration activated sludge method + coagulation dephosphorization method

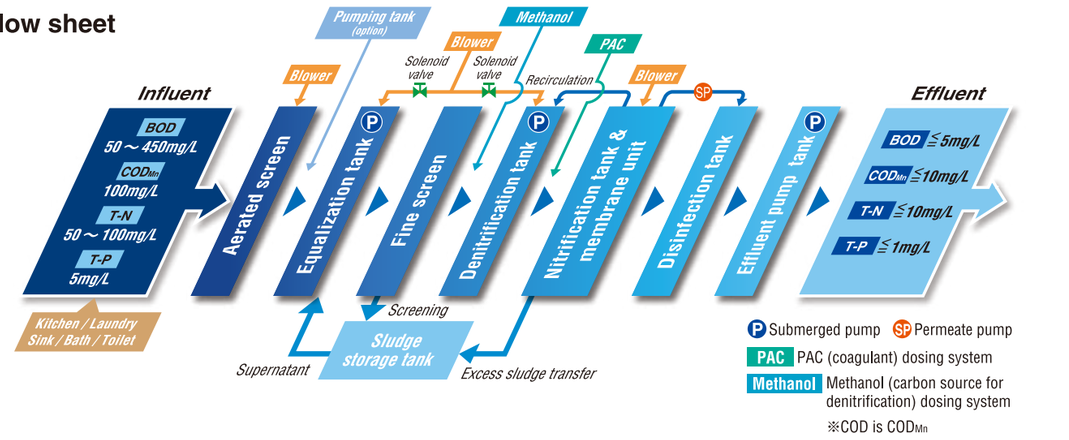
Submerged Membrane

Submerged Membrane® is a patented technology that has been achieved through the combination of Kubota advanced water treatment technology and its unique membrane technology.

Cross-section perspective



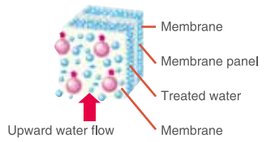
Flow sheet

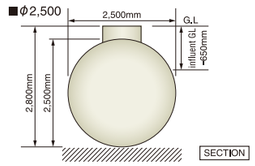


Specifications (inf. BOD 200 mg/L, influent 12 hrs/day)

Flow rate	m^3/day	20	40	100	200
Tank size (φ2,500 x 2,800H)	L (mm)	8,550	6,100＋7,950	7,350＋8,450 ＋7,350＋8,500	8,250＋8,250＋6,950＋7,700 ＋8,250＋8,300＋6,900＋7,700
Rated power (200V)	kW	4.0	4.7	8.8	14.9

KUBOTA Submerged Membrane Unit®

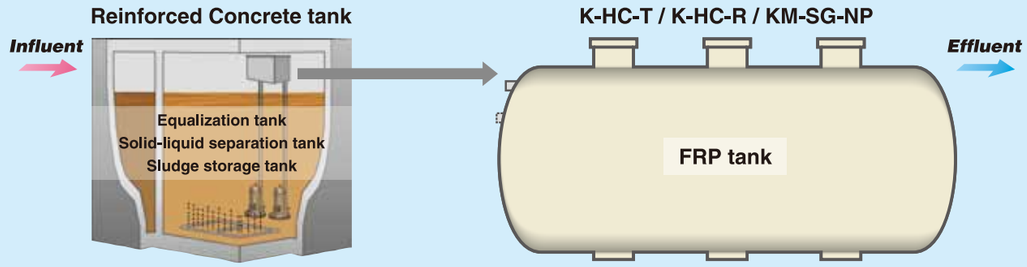




Hybrid system Reinforced Concrete tank + FRP tank

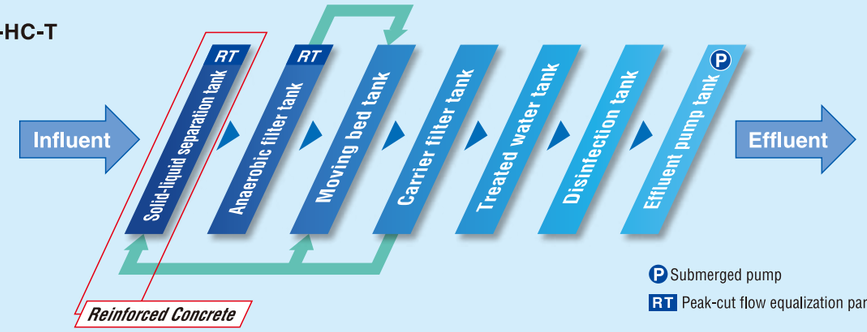
- Variation of tank configuration for narrow space.
- Former tanks without stuffing are replaced by RC.

Cross-section perspective

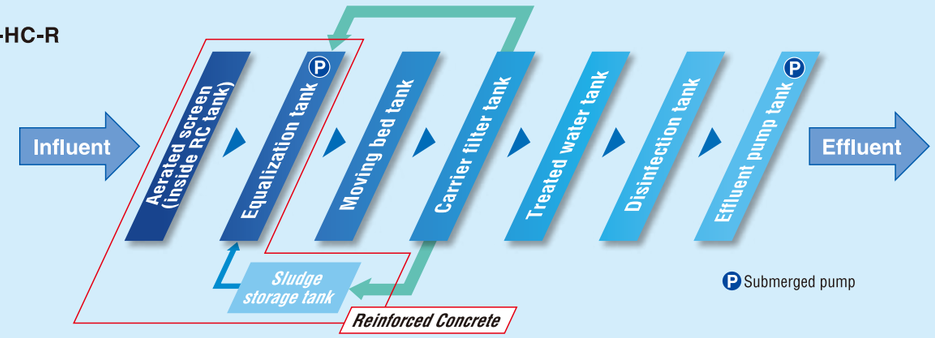


Flow sheet

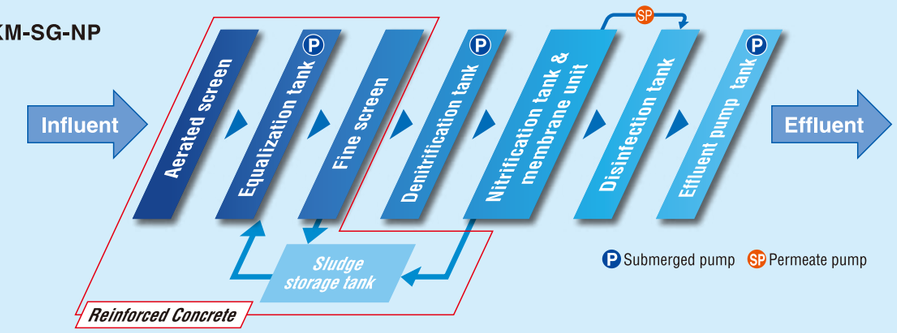
●K-HC-T



●K-HC-R

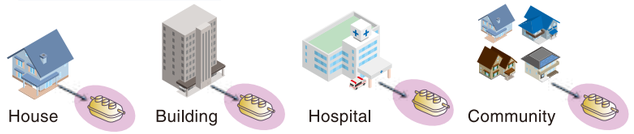


●KM-SG-NP

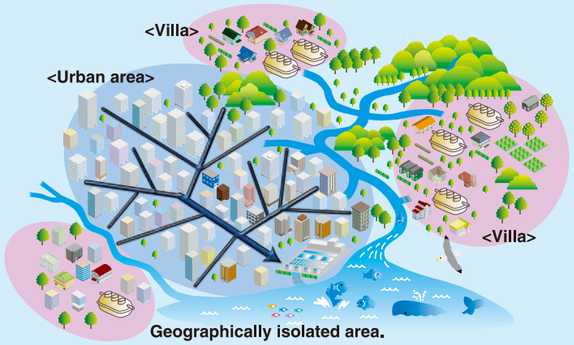


Application for Johkasou

On-site treatment

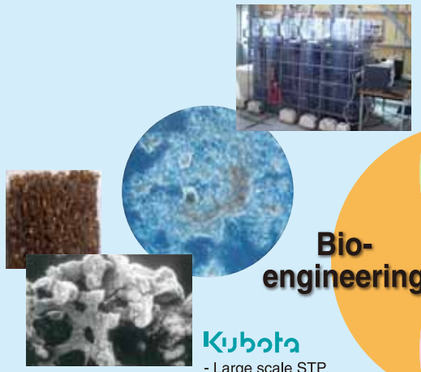


Off-site treatment



- Off-site treatment and On-site treatment can be complement with each other.
  - Off-site treatment: As Efficient system for city
  - On-site treatment: As quick installation/availability
- Planner can choose the optimal one with considering each advantages and features of area/site.

Feature of Kubota Johkasou



Kubota
- Small & Large size Pipe hydraulics and its network technology
- Large size pump hydraulics
- Large size valve hydraulics

$$\frac{\partial}{\partial t}\left(\frac{\partial v}{\partial x}-\frac{\partial u}{\partial y}\right)+u\frac{\partial}{\partial x}\left(\frac{\partial v}{\partial x}-\frac{\partial u}{\partial y}\right)+v\frac{\partial}{\partial y}\left(\frac{\partial v}{\partial x}-\frac{\partial u}{\partial y}\right)=\frac{\mu}{\rho}\left[\frac{\partial^2}{\partial x^2}\left(\frac{\partial v}{\partial x}-\frac{\partial u}{\partial y}\right)+\frac{\partial^2}{\partial y^2}\left(\frac{\partial v}{\partial x}-\frac{\partial u}{\partial y}\right)\right]$$

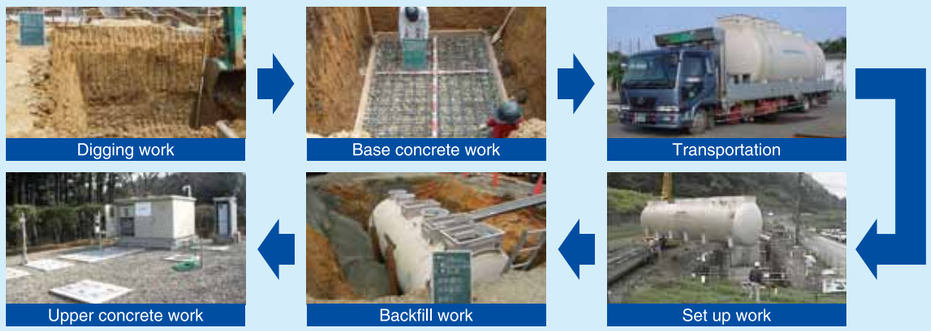
Kubota
- Large scale STP
- MBR process (pioneer)
- Advanced treatment
- Human excreta treatment

Kubota
- Tractor,
- Combine harvester
- Backhoe
- Engine
- Pipes
- Pumps
- Valves
- Membrane

etc.

Kubota
- Shiga Plant
- FRP Subcontract factory fully instructed by Shiga Plant

Installation work



Installation Example

Kubota's FRP Johkasou in use around the world

● Overseas transportation

Container type

● Saudi Arabia: Water recycling

Flow rate 530 m³/day

● Vietnam: for Factory sewage

Flow rate 80 m³/day

● Vietnam: for Factory sewage

Flow rate 12 m³/day

● Vietnam: for Hospital sewage

Flow rate 50 m³/day

● Vietnam: for Individual residence sewage

Flow rate 1.0 m³/day