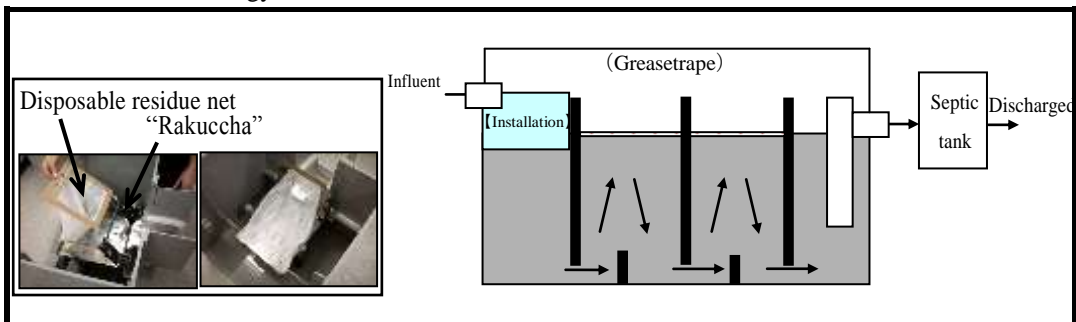


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○ Overview

Technology intended for verification /environmental technology developer	Simplified food residue collection system, “Rakuccha” / KOMATSU Ltd.
Demonstration institution (Conducted by)	Environmental Pollution Control Center, Osaka Prefecture (Environmental Management and Technology Center in Kansai)
Period of the experiment for verification	November 20, 2006 to January 19, 2007
Comparative testing period (this equipment is not operated)	January 22, 2007 to February 16, 2007
Purpose of this technology	This system is attached to the existing grease trap to improve its performance for separating fats and water.

1. Outline of the technology intended for verification



Principle

The food residue collection system “Rakuccha” is mounted on the existing grease trap to improve its ability to separate fats and water. The disposable residue net is mounted on the inflow section base and collects the food residue flowing into the grease trap, thus effectively removing the source of putrefaction. The double net, which consists of polypropylene to which fats adhere easily, is mounted on the inflow section to effectively collect high viscosity fats and perishable scum. This substantially improves the performance of the grease trap, preventing putrefaction in the grease trap and discharging wastewater containing only small amounts of fats. In addition, the interior of the grease trap can be cleaned easily, safely and in a sanitary manner.

2. Outline of the verification experiment

○ Outline of the location for performing the verification experiment

Project type	Japanese restaurant
Project scale	122 seats 10,000~15,000 man / month
Address	1-23, Utani-cho, Neyagawa-shi, Osaka
Influent volume during the verification test period	

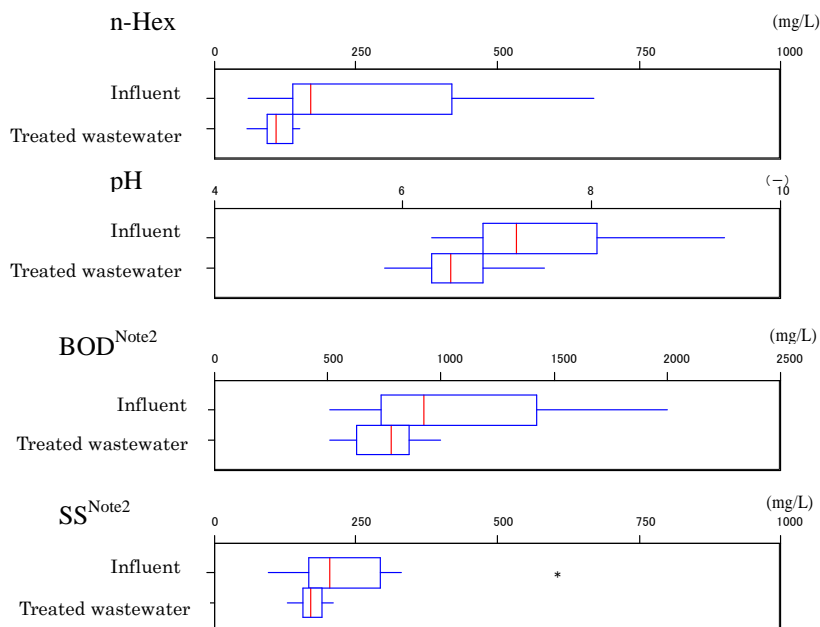
○ Specification and performance of the equipment used for verification

Category	Item	Specifications and water treatment capacity
Outline of the facility	Model	“Rakuccha” Z3
	Size and weight	W300mm×L280mm×H420mm, About 1.2kg
Design conditions	Object and Treatment object Item	n-Hex: The quantity of the substance is reduced to one third of that contained in the effluent before this system is installed. pH: 6 or more (Reference item BOD, SS)
	Model	Replacement net L-L3(3mm) : 10m <sup>3</sup> /day Replacement net L-L4(5mm) : 15m <sup>3</sup> /day

3. Results of the verification experiment

○ Water quality verification experiment

Item	Unit	n number	Results of the verification experiment (central value (lower adjacent value – upper adjacent value))		
			Influent	Treated wastewater	Removal ratio(%) <sup>Note1</sup>
pH	—	39	7.2 (4.9~9.4)	6.5 (5.8~7.5)	—
n-Hex	mg/L	13	170 (60~670)	110 (58~150)	53.5 (-83.3~85.9)
BOD <sup>Note2</sup>	mg/L	12	930 (510~2000)	780 (510~1000)	14.9 (-20.6~63.0)
SS <sup>Note2</sup>	mg/L	12	210 (95~610)	170 (130~210)	21.8 (-70.0~72.1)



Note 1) This was calculated by the formula based on the Verification Test Procedures (Third Version)

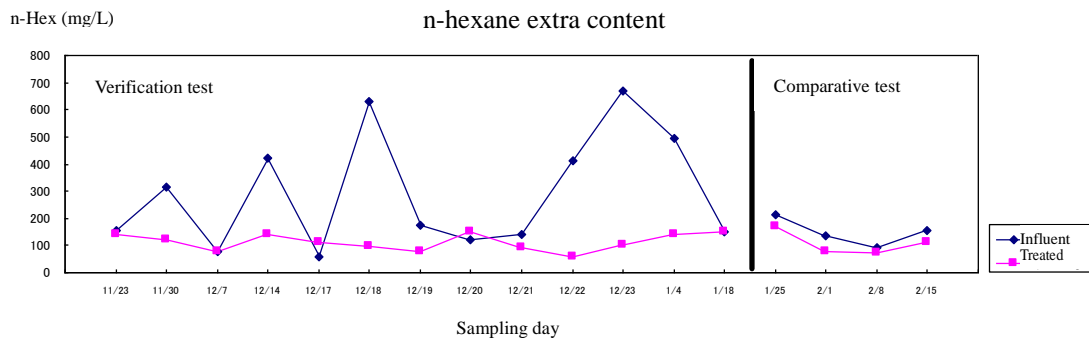
Note 2) Reference item

The quantity of n-hexane extract in the wastewater treated during the verification test period (average: 110 mg/L; central value: 110 mg/L) was almost the same as that in the wastewater treated during the comparison testing period (average: 110 mg/L; central value: 93 mg/L). This was because the influent during the verification test period contained a higher quantity of n-hexane extract (average: 290 mg/L; central value: 170 mg/L) than the quantity of the substance contained in the influent during the comparison testing period (average: 150 mg/L; central value: 140 mg/L). The treatment target is that the quantity of this substance contained in the wastewater treated during the verification test period must be reduced to one third of that contained in the wastewater treated before this equipment is installed (= during the comparison testing period).

When the quantities of n-hexane extract on the respective investigation dates were checked, the quantity of the substance in the influent fluctuated substantially between 100 and 700 mg/L, but that in treated wastewater was stable between 100 and 150 mg/L (see the following graph). Accordingly, this equipment improves the performance of the grease trap.

Although the pH was below 6 several times during the verification test period, the treatment target of pH 6 or over was generally achieved.

[Water quality test results during the verification test]



○ Environmental impact item

Item	Verification result
Amount of wastes	The total weight of the food residue collected during the verification period of 2 months (including the weight of the nets) was 83.2 kg (wet), and the daily average was 1.4 kg (wet) (3 mm mesh: 1.7 kg and 5 mm mesh: 1.0 kg)
Odor	The treated wastewater was odorless or had a slight odor of kitchen wastes (including fats, detergent and bleach).


○ Used resources index

Item	Verification result
Amount of electric energy used	None
Amount of chemical used for waste water treatment	None

○ Operation and maintenance performance item

Maintenance item	Maintenance time per operation and maintenance frequency	Number of people and skill required for maintenance
Period inspection ・ Check the equipment (make sure that it operates normally). ・ Check the tank interior. (Check whether any unpleasant odor is emitted, check the volume of floating fats and remove them, and check the quantity of accumulated sludge.)	15~30 minutes (Average 20 minutes) Once a month	One person is required for one inspection. The person must have experience and knowledge of operating the entire facility.

○ Qualitative remark

Item	Remark
Remark on water quality	 <p style="text-align: center;">Influent      Treated wastewater</p>
Operations required for initiation	Installation: One day (15 minutes) Days required for acquiring the skill for replacing the net: 7 days (5 minutes a day)
Operations required for shutdown	1 day (15 minutes)
Reliability of the equipment intended for verification	Generally the equipment operated stably during the verification test period. However, clogging of the inflow piping was observed, and the disposable net was partially detached.
How to solve the problems	The mesh of the replacement net was changed from 3 mm to 5 mm to prevent clogging of the net.
Evaluation of the instruction manual of operation and maintenance	The manual does not require any corrections.
Others	Although the existing grease trap used to be cleaned once a month, it was not cleaned for two months during the verification test period but the treated wastewater quality was stable.

(Reference information)

All information in this chapter is provided by the environmental-technology developer on its own authority; the Ministry of the Environment and the verification organization are in no way responsible for the content of this chapter.

○ Product data

Items		Column to be filled in by the environmental technology developer			
Name / type		"Rakuccha" Z3			
Manufacturer (distributor)		KOMATSU Ltd.			
Contact address	TEL / FAX	TEL : 044-322-6231 / FAX : 044-322-6068			
	Web address	-			
	E-mail	tjdp552@ybb.ne.jp			
Size and weight		W300mm×L280mm×H420mm, About 1.2kg			
Necessity for pre-treatment and post-treatment		None			
Supplementary facility		None			
Time for initiation		Installation: One day (15 minutes) Days required for a user to acquire the skill: about 7 days			
Approximate cost (yen)	Expense item		Unit price	Quantity	Total
	Initial cost				100,000 yen
	"Rakuccha"		60,000 yen	1set	60,000 yen
	Cleaning before installation		20,000 yen	1set	20,000 yen
	Installation work cost		20,000 yen	1set	20,000 yen
	Others				
	Running cost(monthly)				6,000 yen
	Food-residue collection cost		200 yen	30pieces	6,000 yen
	Cleaning cost (once a month → once every two months) (It is assumed that ¥10,000 is spent per month.)				-5,000 yen
	Per 1 m <sup>3</sup> of treated wastewater(Assuming that 450 m <sup>3</sup> of wastewater is treated a month)				2.2 yen

○ Other information from the manufacturer

- This system was developed to help users clean grease traps easily.
- To make it easy to install the food-residue collection net, the base was mounted on the existing grease trap and users need only insert the net into the guides. Therefore, this equipment is economical and very unlikely to fail.
- The residue collection net removes the food residue, which causes putrefaction, and thus reduces the quantity of sludge generated in the grease trap. Therefore, the grease traps do not need to be cleaned as often as before by the user, reducing the cost.
- Even if the pollution load of wastewater flowing into the grease trap fluctuates significantly, wastewater becomes stable through the residue collection net and the pollution load of treated wastewater is reduced when it is discharged.
- Since food residue, which causes clogging of the drain pipe, is not contained in treated wastewater discharged from the grease trap, the drain pipe is not clogged.