

Overview

Technology intended for verification /verification applicants	Scumsavenet & Oilcatch System NH-F Series / Sannyu Co., LTD.
Demonstration institution	Saitama-ken Environmental Analysis & Research Association
Period of the experiment for verification	December 17, 2013
Purpose of this technology	By using this technology, the food and soup residues contained in the wastewater discharged during cooking and washing are caught by the scumsave net in the grease trap and the oil is collected by the oil absorbent to improve the performance of the grease trap.

1. Outline of the technology intended for verification

Flow diagram, Principle

Wastewater surface

Wastewater Net holder Separation plate Traps

Side ditch Scumsave net

A B C D

Current of wastewater in grease trap is quiet because wastewater does not suddenly flow in grease trap

Oil absorbent

This equipment is installed at the inlet within the grease trap as shown in the left figure. The scumsave net catches the food residues to prevent them from flowing out of the system. The food residues themselves that are caught and accumulate in the scumsave net also filter the wastewater and catch smaller food residues. At the same time, the wastewater flows from the top of the scumsave net into the grease trap to separate the oil. The food residues caught by the net are dewatered and disposed of when the grease trap is cleaned. The oil absorbents, which are made from waste cardboard, are fed during cleaning to absorb the oil floating in the grease trap, and then they are scooped up with a net and disposed of as shown above.

2. Outline of the verification experiment

2.1 Outline of the location for performing the verification experiment

Project type	School cafeteria
Project scale	Number of seats:180, Operating hours: 10:00~14:00, Number of meal: 130~140
Address	3430 Ishihara-machi, Takasaki, Gunma
Influent quantity into the equipment intended for verification ⁽²⁾ (Box plot ⁽³⁾)	<p>Influent quantity (m³/h)</p> <p>1.984m³/day</p> <p>(2): For influent quantity, see Section 6.1 “Results of Monitoring Items” of the detailed version (Page 16 of main part).</p> <p>(3) : For the box plot, see “How to Read the Box Plot” (for Reference) (Page 17 of the main section in the detailed part).</p>

2.2 Specification and performance of the equipment used for verification

Category	Item	Specifications and water treatment capacity
Outline of the facility	Model	Scumsavenet & Oilcatch System NH-F Series
	Size and weight	W200mm × D223mm ~ 266mm × H170mm 1.1kg ~ 2.5kg
Design conditions	Object	n-hexane extract content (n-Hex) Suspended solids (SS)
	performance	This depends on the quantity of food residues and oil contained in the wastewater, not on the wastewater volume.
	Treatment object	90% or more of n-Hex is removed when the raw-water concentration is 250 mg/L or more. 85% or more of SS is removed when the raw-water concentration is 380 mg/L or more.

3. Results of the verification experiment

3.1 Use of existing data

It was already confirmed that this equipment removes 98.91% of food residues based on performance tests conducted according to the HASS-217 requirements specified by the Society of Heating, Air-Conditioning and Sanitary Engineers of Japan, a public-interest incorporated association. In addition, the equipment was installed in the grease traps in various facilities to check its effect on water quality, and we confirmed that the oil concentration was reduced by about 90%. Accordingly, the existing data can be used to shorten the period of the verification test. However, to compare the treated water before and after installing the equipment, the difference in time and quality when the wastewater is discharged must be considered. Therefore, it is necessary to sample the influent to the grease trap and the treated wastewater at the same time and to conduct a verification test through daily investigation.

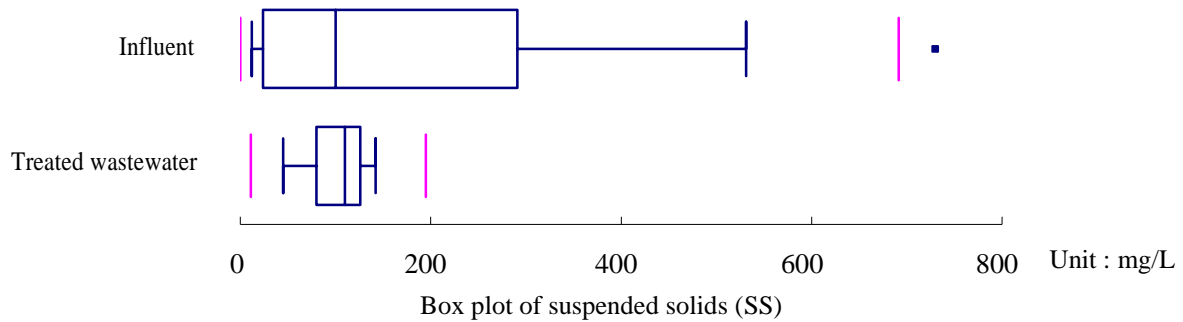
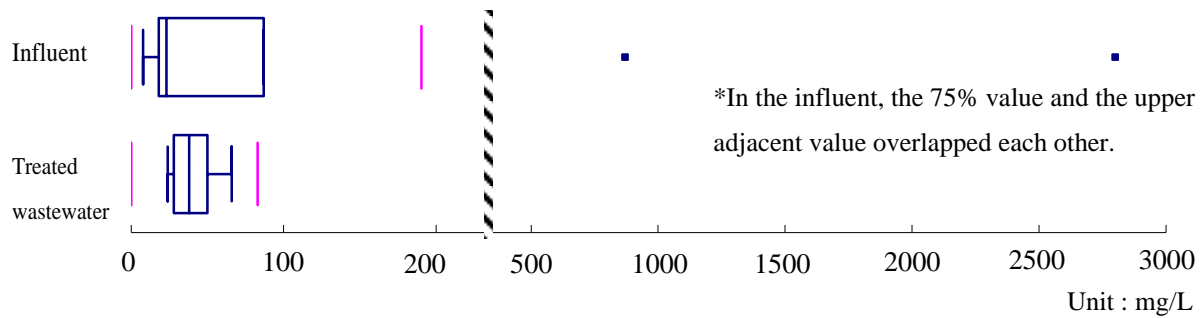
3.2 Water quality verification experiment

The content of n-hexane extract (n-Hex) was 7.8–2,800 mg/L in the influent and 24–66 mg/L in the treated wastewater. The average concentration of this substance in the treated wastewater was 40 mg/L. The removal ratio was 93%, achieving the target of 90% or more. The removal ratio was 98% when the raw-water concentration was 250 mg/L or more.

The content of suspended solids (SS) was 12–730 mg/L in the influent and the average concentration was 98 mg/L in the treated water, giving a removal ratio of 62%. However, the removal ratio was 88% when the raw-water concentration was 380 mg/L or more.

Table Verification examination results of water quality item

Item / Unit		n-Hex		SS	
		Influent	Treated wastewater	Influent	Treated wastewater
water quality concentration (mg/L)	Minimum to maximum value	7.8~2,800	24~66	12~730	45~140
	Average	490	40	240	98
Pollution load	g/30 minutes	1.8~770	5.5~23	2.8~210	15~42
	g/day	1,200	79	500	190
Removal ratio	%	93		62	



The biological oxygen demand (BOD), a reference item, was 500 mg/L in the influent and 240 mg/L in the treated water. The removal ratio calculated from the pollution load was 55%.

3.3 Operation and maintenance item

(1) Environmental impact item

Item	Verification result
Amount of sludge	No sludge is generated in the treatment process by the verification equipment.
Amount of wastes	Workers must dispose of the food residues caught by the scumsave net and the used oil absorbents.
Noise	No noise is generated by the verification equipment.
Odor	The verification equipment did not produce abnormal odor while it was operating or stopped compared with other odors in the kitchen.
Recovery of oil	The recovered oil quantity during the verification experiment was 12 g/day


(2) Used resources index

Item	Verification result
Oil absorbent	50 g of the material was used for one cleaning in the verification test.
Scumsave net	The net was replaced once every day.

(3) Operation and maintenance performance item

Maintenance item	Maintenance time per operation and maintenance frequency	Number of people and skill required for maintenance
Before use	Setup of Scumsave net (Once two minutes)	One person without any special skills is required.
Collection of caught residues	Exchange of Scumsave net (Once two minutes)	One person without any special skills is required.
Recovery of oil	Recovered oil by oil absorbent (Once three minutes)	One person without any special skills is required.

(4) Qualitative remark

Item	Remark
Remark on water quality	<p>Although the oil concentration in the influent fluctuated substantially, it was removed effectively in the treated water. Comparing the oil concentration between the influent and the treated water, the average concentration was 490 mg/L in the influent and 40 mg/L in the treated water. When the concentration in the influent was the maximum of 2,800 mg/L, it was reduced to 46 mg/L in the treated water, indicating that the equipment removed the oil at high concentrations very effectively. (See Section 6.2 “Water Quality Verification Items on Page 19 of the Main Paper”.) By comparing the influent and the treated wastewater, which looks slightly whitish, in appearance, it was confirmed that the highly concentrated influent was effectively treated.</p> 
Operations required for initiation	The scumsave net must be mounted on the equipment.
Operations required for shutdown	The scumsave net must be dismounted from the equipment.
Reliability of the equipment intended for verification	No trouble occurred in the verification equipment during the experiment.
How to solve the problems	<p>If the scumsave net becomes clogged, the chief worker must remove the residue from it. If the equipment becomes abnormal, contact the manufacturer (verification applicant).</p>
Evaluation of the instruction manual of operation and maintenance	The instruction manual for operation and maintenance was easy to understand. The operator could sufficiently understand the equipment and perform proper maintenance.
Others	This equipment effectively treats wastewater containing a large amount of food residues and oil and efficiently improves the performance of the grease trap. In addition, the treatment principle is simple, the scumsave net is easy to mount and dismount, and the oil can be collected easily. The used oil absorbents can either be disposed of or used as a combustion improver.

4. Reference information

The information shown in this chapter is provided by the applicant for verification at its responsibility for publication of the technical data and not the subject of the verification experiment. The Ministry of the Environment and the organization conducting the verification experiment are not responsible for the information in this chapter.

4.1 Product data

Items	Column to be filled in by the applicant for verification			
Name / type	Scumsavenet & Oilcatch System NH-F Series			
Manufacturer (distributor)	Sannyu Co., LTD.			
Contact address	TEL / FAX	TEL (03)3877-1315 / FAX (03)3877-1316		
	Web address	http://www.sannyu.com		
	E-mail	t.tanaka@sannyu.com		
Size and weight	Size: W200mm × D223mm ~ 266mm × H170mm Various net holders are available according to the position and shape of the influent inlet of the grease trap. Weight: 1.1kg ~ 2.5kg (Depending on the types of net holder)			
Necessity for pre-treatment and post-treatment	Pretreatment: None After treatment : Disposal of collected food residues and oil			
Supplementary facility	None			
Life of the equipment	Usable semi permanently (However, if damaged, the holder must be replaced.)			
Time for initiation	The equipment can be used immediately after installation.			
Approximate cost (Maintenance is to be performed by the user)	Expense item	Unit price	Quantity	Total
	Initial cost			Total 39,850 yen
	Net holder	28,000yen	1 machine	28,000 yen
	Scoop net	3,850 yen	Stick of scoop net	3,850 yen
	Cost for dispatching our instructor for installation (in the Tokyo area and surroundings)	8,000 yen	1 place	8,000 yen
	Running cost (monthly)			Total 6,160 yen / month
	Scumsave net ¹⁾	280 yen/1piece	12 pieces	3,360 yen
	Oil absorbent (2kg) ²⁾	5,600 yen/1box	1/2 box	2,800 yen
	1): When the net is replaced once every three days 2): When the absorbent is used 200g once every three days			
	Per 1 m ³ of treated wastewater			205 yen /day
Note) The cost depends not on the water volume but on the quantity of food residues and oil. The cost does not include the expenses for disposing of food residues and oil.				

4.2 Other information from the manufacturer

1. Delivery record

The equipment is used by more than 13,000 facilities including public offices, supermarkets, shopping centers, hotels and restaurants.

2. Innovative spirit of technology

1999: Obtained utility model registration (Registration No. 3063807).

Registered as Tokyo Business Activity for Development of Creative Technology.

2000: Approved as Tokyo Promotion Activity for Development of Creative Technology.

We conducted tests on removal efficiency based on HASS217 (Standards for "Grease Trap" by the Society of Heating, Air-Conditioning and Sanitary Engineers of Japan).

2005: Obtained patent (Patent No. 3668894).

2012: The scumsave net was delivered to over 13,000 facilities.

3. Strong point of the product

●Collection of residues

The scumsave net can catch smaller food residues. (The net has a finer mesh than the conventional ones.) A net holder needs to be mounted on the grease trap to use the scumsave net. NH-F series net holders are suited for mounting on grease traps which have a one-way PVC pipe inlet and can also be mounted on deep grease traps installed outdoors or outside the kitchen. Compared with the difficult conventional cleaning method of pulling up large stainless-steel cages from deep grease traps to collect the food residues, this product enables workers to collect the food residues easily.

●Recovery of floating oil

The oil absorbent used during cleaning has good water repellency and so can collect oil floating on the water surface very easily. In the conventional oil collection method, in which oil is scooped up with a ladle or dipper, it is very difficult to collect only the oil floating on the water surface, and so workers tend to abandon the cleaning and discharge a large amount of oil from their facilities.