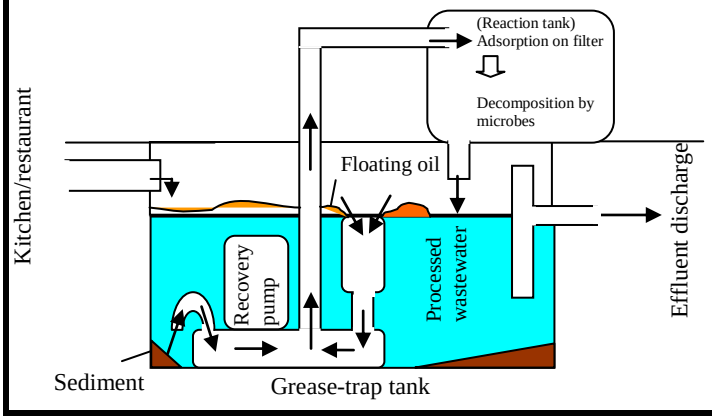
○ Overview

Target verification technology/environmental technology developer	Zerocompo (wastewater treatment apparatus for kitchens <<oil recovery>>) / Kowa Emtech Ltd.
Verification organization (Conducted by)	Hiroshima Prefecture (Hiroshima Prefectural Health and Environment Center, Hiroshima Environment & Health Association)
Verification-test period	Nov. 25, 2003 to Feb. 28, 2004
Object of technology	a. Automatic removal of floating oils and sediments from the grease trap b. Suppression of waste and foul odors

1. Summary of the target verification technology

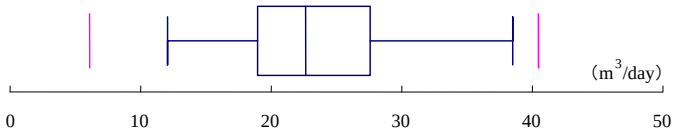


Principle

Floating oil and sediment in the grease trap are automatically fed together with part of the wastewater into the reaction tank by a pump, and the oils are adsorbed onto the filter. A microbial preparation is supplied periodically into the reaction tank, and the floating oil and sediment adsorbed onto the filter (made primarily of rice hulls) are decomposed by the microbes.

2. Summary of the verification test

○ Summary of the verification-test site

Type of business	Hotel (banquet, wedding banquet, dining, lodging, sport facility, meeting room, and others)
Business scale	Accommodation facility: 46 guest rooms; restaurant: 80 seats; 4 banquet halls: 470 guests at maximum; others (wedding hall and others)
Location	9-7, Midori-cho, Fukuyama City, Hiroshima Prefecture
Wastewater flow rate during the verification-test period	

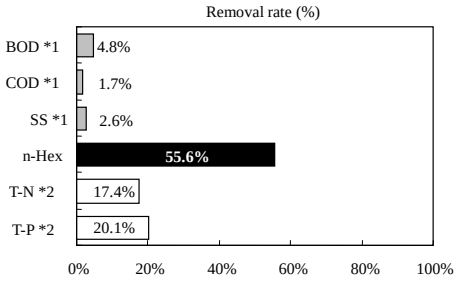
○ Specification and processing capacity of the target verification apparatus

Classification	Item	Specification and processing capacity
Summary of the facility	Type	Z-025
	Size and weight	(Apparatus) 415 mm (W) × 410 mm (D) × 520 mm (H); 35 kg (Pump unit) 231 mm (W) × 275 mm (D) × 241 mm (H); 5 kg
Design conditions	Target substance	n-Hex
	Processing capacity	Grease-trap capacity: Approximately 70 to 300 liters Number of meals served: Approximately 200/day

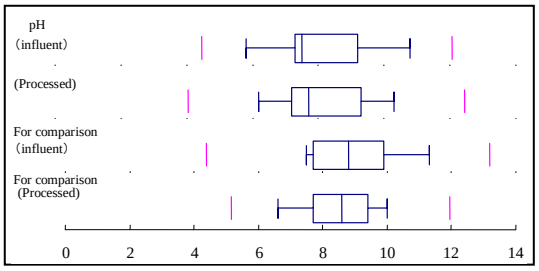
3. Verification-test results

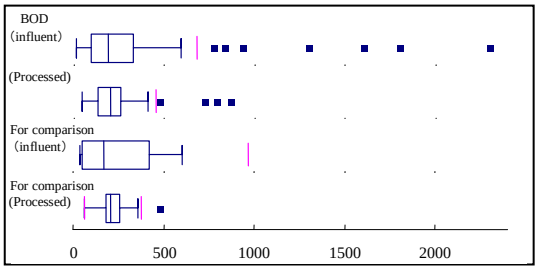
○ Verification items concerning water quality

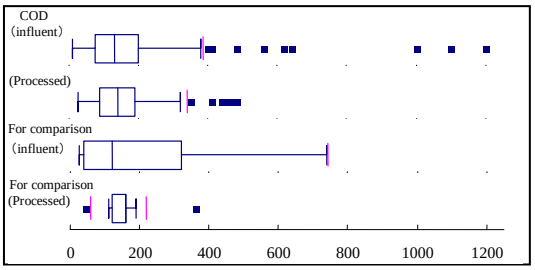
Item	Unit	Verification result (lower neighboring value to higher neighboring value, and median value)			
		Influent wastewater		Processed wastewater	
pH *1	-	5.8-11.3	7.7	6.2-10.3	7.7
BOD *1	mg/L	13-770	190	44-410	200
COD *1	mg/L	8.5-410	130	26-320	140
SS *1	mg/L	1-130	39.5	10-92	39
n-Hex	mg/L	1.5-110	25.5	1.7-48	14
T-N *2	mg/L	1.1-24	6.55	1.6-15	6.8
T-P *2	mg/L	0.23-3.1	0.825	0.21-1.5	0.78

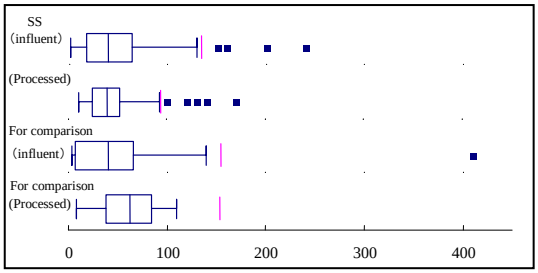


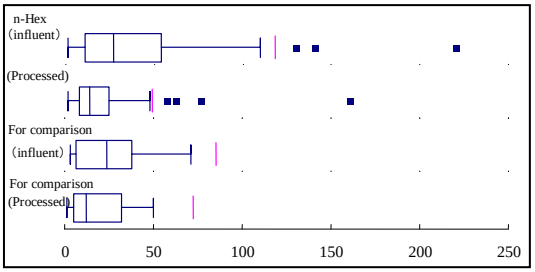
The qualities of the influent and processed wastewaters into and out of a grease trap when the verified apparatus is not in operation are also shown at the bottom of the respective graphs for comparison purposes.

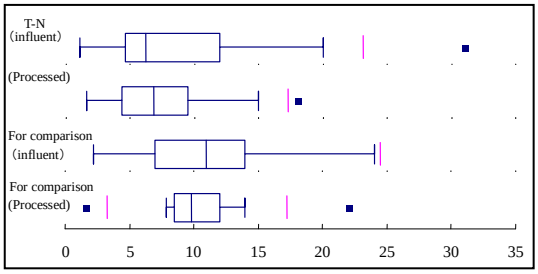


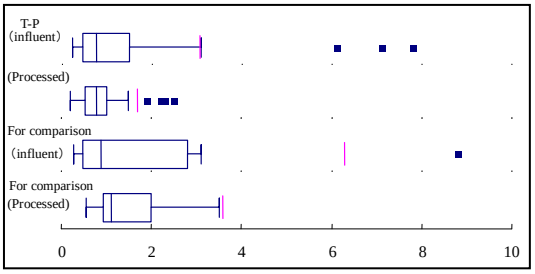












Note 1: Median value of removal rates determined daily: "(load in influent wastewater - load in processed wastewater) / load in influent wastewater"

Note 2: *1 indicates items the removal of which is not intended in the target verification apparatus; *2 is a reference item.

Note 3: Number of pieces of data: influent and processed wastewater (from pH to n-Hex): 77; influent and processed wastewater (T-N and T-P): 39; control (influent and processed wastewater): 9

○ Items concerning environmental impact

Item	Verification result
Amount of generated sludge	0.024 kg/day, dry
Amount of generated waste	0.36 kg/day, wet The rice-hull filter can be disposed of as general waste, depending on the municipality.
Noise	None (in four-stage evaluation: none, slightly noisy, noisy, and very noisy)
Odor	None (in four-stage evaluation: none, faint odor, odor, and strong odor)]

○ Items concerning used resources

Item	Verification result
Electricity consumption	2.4 kWh/day
Water consumption	1.1 m^3/day
Wastewater treatment chemicals and other consumption	Liquid microbial preparation (trade name: "Kabios"): 0.052 L/day
Other consumables	Filter (trade name: "Biocore"): 0.11 kg/day

○ Items concerning operation and maintenance performance

Control point	Time and frequency of maintenance and management	Number and technical skill of operators required for operation and maintenance
Daily inspection	5 minutes (once per day)	No specialized knowledge or technical skill is required for normal operation. One-man operation is possible.
Periodic inspection (confirmation of settings, refill of consumables, and simple cleaning)	15 to 30 minutes (twice per month)	
Maintenance (filter exchange, tank cleaning, and periodic inspection)	60 minutes (twice per month)	
Others (setting and adjustment)	Until confirmation of normal operation (set time)(Once during the verification-test period)	

○ Qualitative findings

Item	Findings
Water-quality findings	The influent wastewater and the effluent wastewater exhibited a faint fish and shellfish odor, were pale white, and had a transparency of approximately 13. Oil films and bubbles caused by the surfactant were occasionally observed.  2003/11/26 (Before operation)  2004/01/25 (60 days after operation)
Period required for startup	5 days [total working period: 330 minutes] * Including installation and trial run
Period required for removal	1 day [total working period: 135 minutes]
Reliability of the target verification apparatus	The apparatus operated consistently during the verification-test period.
Method of solving problems	Operate according to the operation and maintenance manual. Specialized knowledge will be required for adjustment of the operational conditions.
Evaluation of the operation and maintenance manual	No particular problems to be solved.
Others	a. The generation of floating oils and the like is suppressed with no deterioration in water quality. b. The generation of foul odor as well as noise is also suppressed. c. The amount of waste such as oils decreased compared to that obtained by processing in the existing grease trap before installation of the apparatus.

(Reference information)
All of the information given on this page 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 contents of this page.

○ Product data

Item		Description given by the environmental-technology developer
Name/type		Zerocompo / Z-025
Manufacturer (distributor) name		Kowa Emtech Ltd.
Contact address	TEL/FAX	TEL：084-943-7734　FAX：084-943-9934
	Website	http://www.kowa-m.co.jp
	e-mail	info@kowa-m.co.jp
Size and weight		415 mm (W) × 410 mm (D) × 510 mm (H); 35 kg
Necessity of pre- and post-treatment		A grease trap with a suitable capacity selected in accordance with the kitchen wastewater flow rate should be installed and managed as specified by the manufacturer.
Additional facility		Power supply: single phase, 100 V, 50/60 hz, 15 A; water supply: tap water; pressure: 2 kgf/cm^2 or more
Life of the target verification apparatus		7 years
Startup period		5 to 7 days (confirmation of the installation and operational conditions, no effects on the business of the establishment)

Approximate cost (yen)	Cost	Unit cost	Quantity	Total
	Initial cost			1,240,000
	Zerocompo (including transportation)	1,060,000	1 set	1,060,000
	Installation and adjustment	80,000	1 set	80,000
	Civil, electric, and water work	100,000	1 set	100,000
	Operating cost (month)			16,900
	Sludge disposal	-----	-----	-----
	Waste disposal	0*	1 set	0*
	Electricity	1,400	1 set	1,400
	Water	3,200	1 set	3,200
	Wastewater treatment chemicals			12,300
	Biocore (20 L)	5,000	1.5 L	7,500
	Biological preparation (1.5 L)	4,800	1 L	4,800
	Other consumables	-----	-----	-----
	Maintenance and management subcontracting	-----	-----	-----
	Per m^3 of processed wastewater (assumed amount of processed wastewater: 360 m^3/month)			46

○ Other information from the manufacturer

- The floating-oil suction device (Q Pot: patented) collects only floating oils efficiently. At the same time, the suction port at the bottom collects sediments, thereby continuously cleaning the interior of the grease trap.
- The removal of floating oils and others suppresses the generation of foul odors.
- A compact and simple apparatus that can be installed in existing grease traps
- Highly active degrading microbes decompose the recovered oil and sludge, thereby reducing the amount of waste.
- The pumps and reaction tank are automatically controlled, eliminating the need for adjustment after startup.

* The waste-disposal cost was shown in the table as 0, as the waste can be disposed as general waste, depending on the municipality.