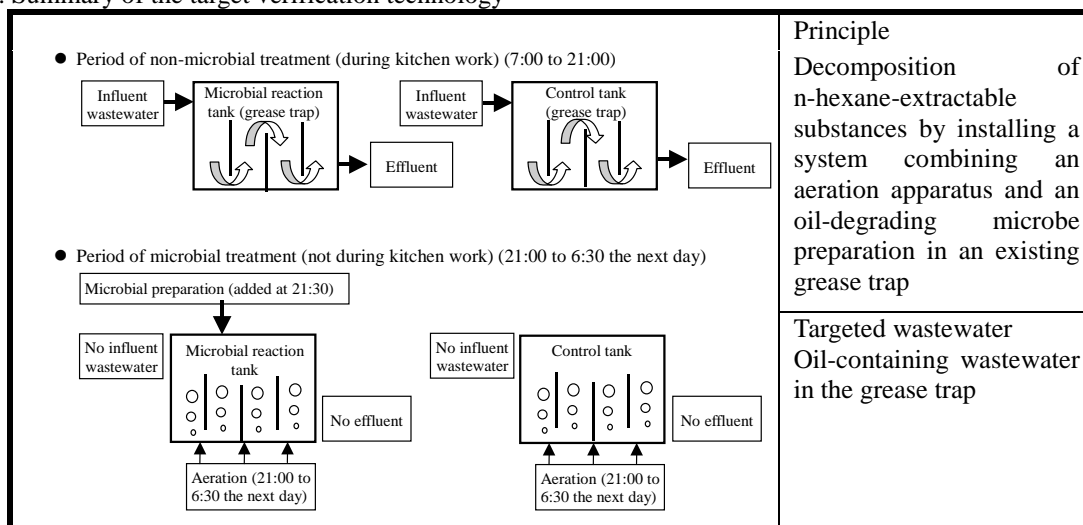


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○ Overview

Target verification technology/environmental technology developer	Oil-containing-wastewater treatment technology using an oil-degrading microbe preparation / Gate Co., Ltd.
Verification organization (conducted by)	Ishikawa Prefecture (Ishikawa Prefectural Health Environment Center, and Research Center of Environment & Pollution Co., Ltd.)
Verification-test period	Dec. 4, 2003 to Feb. 26 (27), 2004
Object of technology	Decomposition of the oils collected in an existing grease trap

1. Summary of the target verification technology



2. Summary of the verification test

○ Summary of the verification-test site

Type of business	University restaurant (restaurant and tea house)
Business scale	Restaurant: 200 seats; teahouse: 32 seats
Location	1-1, Asahidai, Tatsunokuchi-cho, Nomi-gun, Ishikawa Prefecture
Wastewater flow rate during the verification-test period	<p>The box plot shows the distribution of wastewater flow rate. The x-axis is labeled (m^3/day) and ranges from 0 to 25. The plot shows a median around 15, with a box from approximately 13 to 18, whiskers extending from 10 to 20, and outliers at approximately 4 and 5.</p>

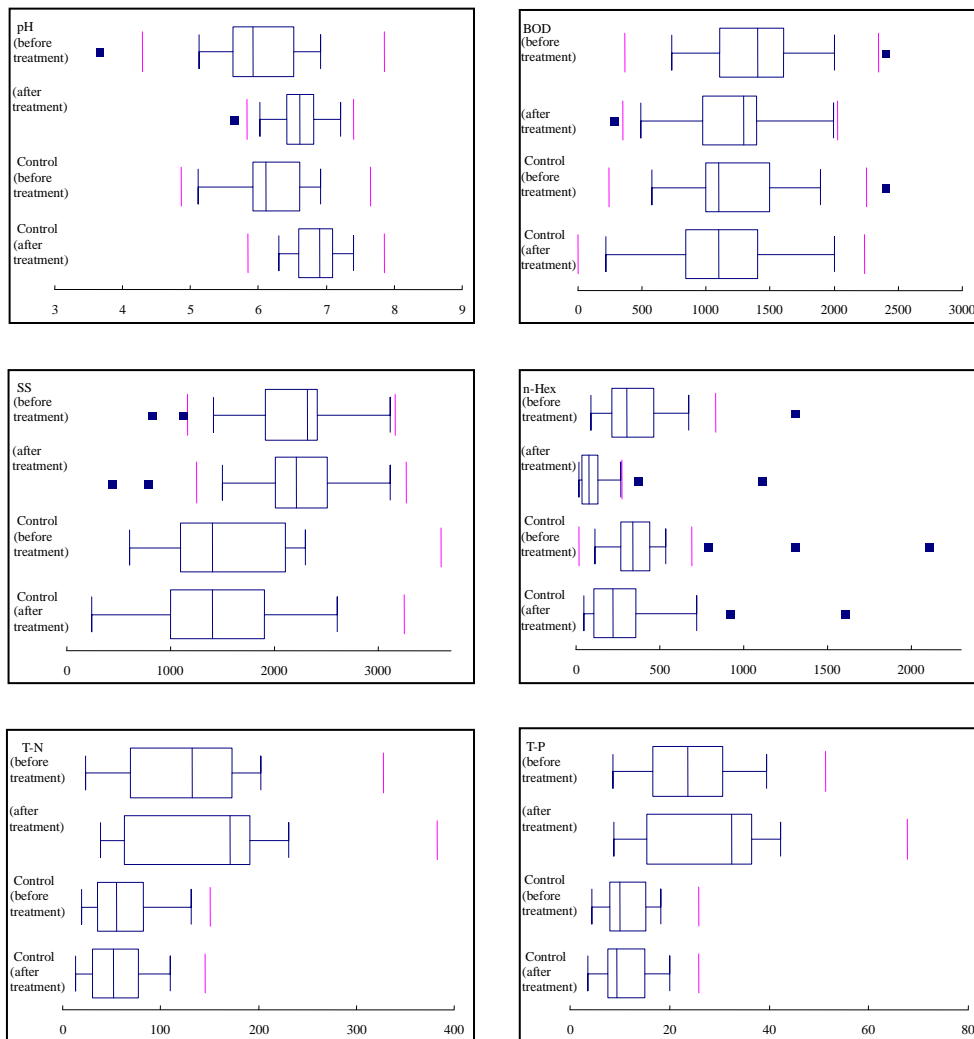
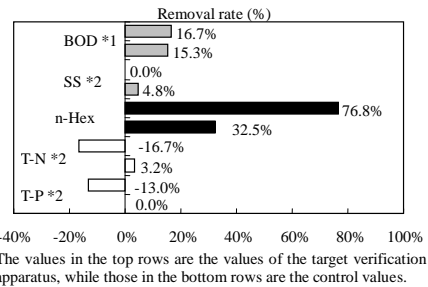
○ Specification and processing capacity of the target verification apparatus

Classification	Item	Specification and processing capacity
Summary of facility	Name/type	Oil-containing-wastewater processing technology, using an oil-degrading microbe preparation
Design conditions	Target substance	n-Hex
	Momentary maximum inflow rate	Momentary maximum inflow rate into grease trap: 133 L/min
	Processing capacity	Size of grease trap: 1,180 mm (W) × 380 mm (D) × 900 mm (H)

3. Verification-test results



○ Verification items concerning water quality

Item	Unit	Verification results (lower neighboring value to higher neighboring value, and median value)			
		Water quality before microbial treatment		Water quality after microbial treatment *3	
pH *1	-	5.1-6.9	5.9	6-7.2	6.6
BOD *1	mg/L	720-2,000	1,400	490-2,000	1,300
SS *2	mg/L	1,400-3,100	2,300	1,500-3,100	2,200
n-Hex	mg/L	70-660	290	8-260	65
T-N *2	mg/L	20-200	130	38-230	170
T-P *2	mg/L	7.8-39	23	8.2-42	32



Note 1: Median value of the removal rates determined daily: "(load in influent wastewater - load in processed wastewater) / load in influent wastewater"
 Note 2: *1 indicates an item the removal of which is not intended in the target verification apparatus; *2 indicates a reference item; *3 indicates the value of the effluent in the tank before discharge, which differs from the actual value of the effluent discharged.
 Note 3: Total number of pieces of data: 17

○ Items concerning environmental impact

Item		Microbial reaction tank	Control tank
Amount of residue generated	On the tank wall above the water	12 g/day; oil content: 30%	13 g/day; oil content: 53%
	On the tank wall under the water	0.3 g/day; oil content: 7.4%	0.5 g/day; oil content: 18%
	Sediment	55 g/day; oil content: 8.4%	31 g/day; oil content: 29%
Pipe clogging		Fine granular residues observed 	Translucent icicle-like oil mass (1 cm) observed 
Odor		Foul odor above the tank when the microbes are activated and the cover is removed	Faint kitchen smell and faint oil smell


○ Items concerning used resources

Item	Verification result
Electricity consumption	1.13 kWh/day
Wastewater treatment chemicals and other consumption	Microbial preparation (trade name: "GS-1"): 40 g/day Microbe nutritional activator: 120 g/day

○ Items concerning operation and maintenance performance

Control point	Time and frequency of maintenance and management	Number and technical skill of the operators needed for operation and maintenance
Addition of microbial preparation	3 minutes (once per day)	No specialized knowledge or technical skill needed
Addition of microbe nutritional activator	3 minutes (once per day)	No specialized knowledge or technical skill needed
Adjustment of aeration balance	5 minutes (once per week)	No specialized knowledge or technical skill needed
Blower inspection (periodic inspection)	10 minutes (once per month)	No specialized knowledge or technical skill needed

○ Other qualitative findings

Item	Findings
Water-quality findings	Not during microbial treatment: Both the influent and effluent wastewaters (in the microbial-reaction and control tanks) are milky white. During microbial treatment: Brownish milky-white to yellowish-brown precipitates are generated in both the microbial-reaction and control tanks. 
Period required for startup	
Period required for shutdown	Not verified, as the facility exists and is in operation
Reliability of target verification apparatus	The apparatus operated constantly during the verification-test period.
Method of resolving problems	Contact the manufacturer or a dealer if there is a problem.
Evaluation of the operation and maintenance manual	No particular problems to be solved
Others	-----

(Reference information)

All information 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	Oil-containing-wastewater processing technology, using an oil-degrading microbe preparation (GS-I)			
Manufacturer (distributor) name	Gate Co., Ltd.			
Contact address	Tel/Fax	TEL : 076-294-0008 FAX : 076-294-0006		
	Website	http://www.bio-gate.jp/		
	E-mail	infor@bio-gate.jp		
Size (mm) and weight	Blower (HP-120): 256 mm (W) × 200 mm (D) × 222 mm (H), 7 kg Blower (HP-80): 235 mm (W) × 180 mm (D) × 196 mm (H), 5 kg Aeration pipe: 300 mm (L) × 8 pieces, 1 kg Preparation: Dry white powder; volume density: approximately 0.6			
Necessity of pre- and post-treatment	Food residues are to be removed as part of pretreatment.			
Additional facility	A suitable grease trap is required.			
Life of target verification apparatus	Approximately 30 years Microbial preparation (GS-I): 2 years			
Approximate cost (yen)	Item	Unit cost	Quantity	Total
	Initial cost			252,016
	Aeration system	-----	1 set	250,000
	Operating cost (month)			42,676
	Sludge disposal	-----	-----	-----
	Waste disposal	-----	-----	-----
	Electricity	12 yen/kWh	28.3kWh	340
	Water	-----	-----	-----
	Wastewater treatment chemicals			42,336
	Microbial preparation GS-I	45 yen/g	840g	37,800
	Microbe nutritional activator	1.8 yen/g	2,520g	4,536
	Other consumables	-----	-----	-----
	Maintenance and management subcontracting	-----	-----	-----
Per m ³ of processed wastewater (assumed amount of processed wastewater: 188 m ³ /month)				

○ Other information from manufacturer

- Gate microbes are microbes isolated from natural environments in Japan. The species and properties of the microbes were characterized by DNA analysis and the biochemical identification method.
- Gate microbial preparations contain no surfactant (neutralizer) or enzyme.
- Gate microbial preparations were commercialized in collaboration with universities and public test organizations.