

SEWAGE TREATMENT PLANT

IMO Resolution MEPC 159(55)



HAN YOUNG ENGINEERING CO.,Ltd has met the challenge of protecting the environment by developing a new advanced wastewater treatment process based on biological degradation and membrane separation. This process produces the highest quality discharge without requiring any addition or generation of chemicals that are hazardous to the environment or ship operation. Han young contracted industry–university cooperation in Korea Maritime University.

Efficiency of purification

The Han young system applies to ships and marine structures the process of biological waste water treatment in combination with submerged low–pressure micro–filtration membranes, which act as barriers to the activated sludge as well as to bacteria and viruses. Accordingly the Han young technology purifies water – without any final clarification or any additional disinfection –that meets the quality standards of as well IMO/MARPOL, HELCOM, German Federal Law Gazettes No. II, page 1378 and No. I, page 1221, USCG, US Federal Law Gazette No. 40, section 133, Australian ADNOC and Australian Federal Environmental agency as Alaska agreement.

Effluent Constituent	IMO Resolution MEPC.2(VI)	USCE 33CFR 159	Tertiary Treatment proposed by some local Australian Agencies	NATO proposal suggested as achievable by 2005	USA 22CFR 159 Alaskan waters cruise ships	Han young tested
BOD ₅	50mg/L	Not required	20mg/L	30mg/L	30mg/L	4.1mg/L
COD				300mg/L		6.5mg/L
Chlorine	As low as possible	Not required		Not permitted	10mg/L	0mg/L
Total Suspended Solids	50mg/L	150mg/L	30mg/L/100	0mg/L/30mg	/L	4.5mg/L
Total Nitrogen			4mg/L	40mg/L		4mg/L
Total Phosphorus			1mg/L	10mg/L		1mg/L
pH		Not required	6-8.5	6-9	6-9	7-8
Fecal Coliforms	250coli/100mL MPN	200coli/100mL	150c oli/100mL	2 CFU/mL (200coli/100mL)	20coli/100mL MPN	10coli/100mL

New market drivers

Regulatory requirements

- USCG/IMO Regulations for the quality of black water discharges.
- USCG/EPA indications that grey water discharges will be regulated and monitored.
- NATO navy strategy for environmentally sound warships.
- ndication that discharge consents for offshore platforms will be aligned with marine standards.

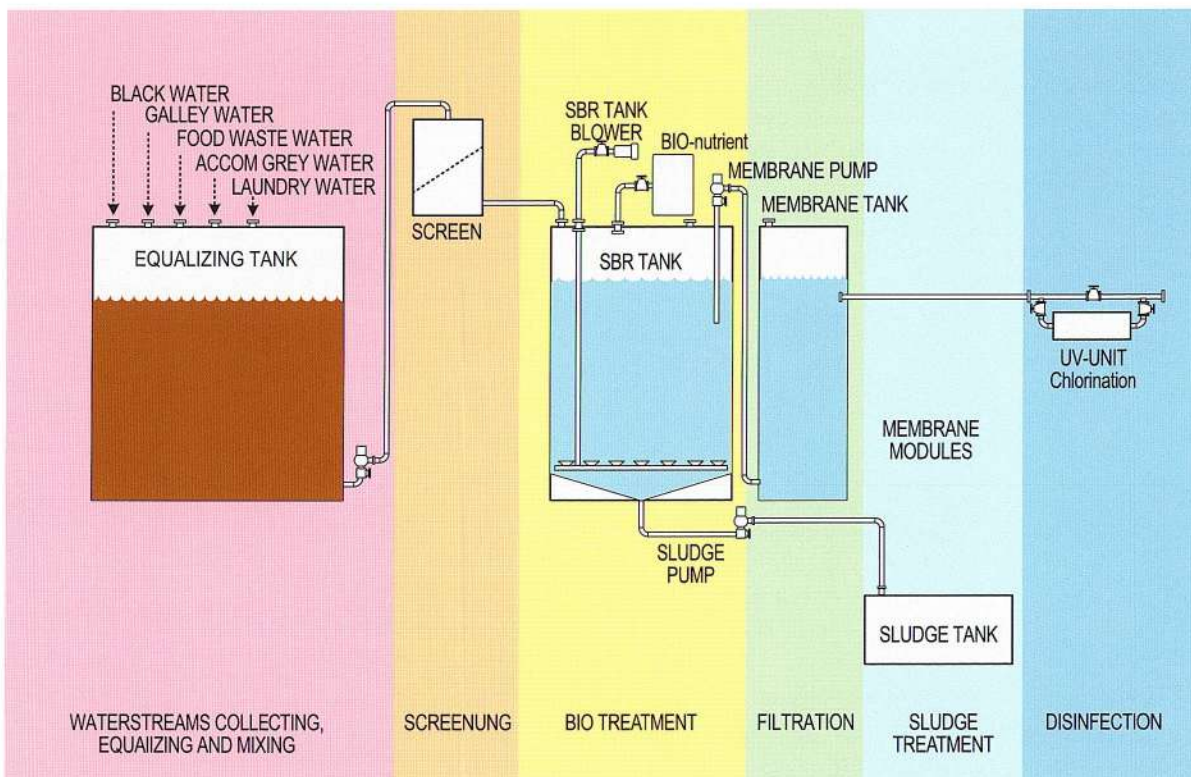
Customer requirements

- Meet the likely regulatory requirements for both new and existing installations.
- Maintain an acceptable public image.
- Minimisation of size and weight. Lowest possible total cost of ownership.
- Biosolids dewatering.
- Nutrient removal

OUR PRODUCT RANGE

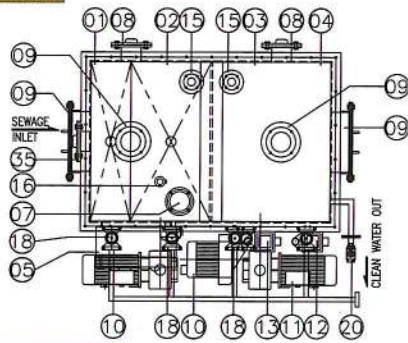
Principles of operation

Wastewater collected in the ship's Equalizing tanks (Black water, Galley water, Food waste water, Accom grey water, Laundry water) is pumped to an automatic screen press. Sanitary grey water is collected into buffer tanks and fed to the same automatic screen press. Each MBR includes SBR stages, contained within a single process tank unit. SBR stages are fitted with aerators fed from duty and standby blowers. Wastewater passes through the screen press into the first stage SBR where the active biomass degrades organic material. The active biomass is pumped through an interstage filter which returns particulate and fibrous material to the screen press. The filtered biomass is transferred by duty and standby pumps into the second micro-filtration units, free of any fibers which could cause blockages in the membrane modules. Clean permeate is taken from the membrane modules through flow control valves and flow meters, allowing individual monitoring of each membrane module. Permeate is collected from all membrane modules into a tank and pumped for discharge by duty and standby pumps. Isolating valves are provided throughout the system to enable maintenance of pumps, membrane modules and other components without shutdown of the plant. The system is automated.

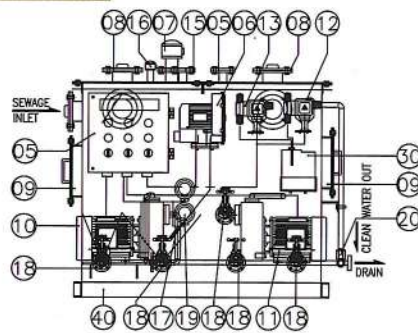


TECHNICAL INFORMATION(EXTERNAL STRUCTURE)

PLAN VIEW



ELEVATION VIEW



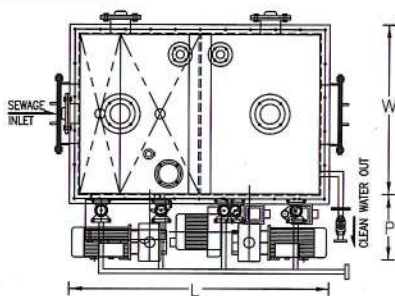
SYMBOL LIST

NO	DESCRIPTION	Q'TY
01	pre-treatment tank	1
02	bio-reactor chamber	1
03	filter out the impurities	1
04	chemical (disinfection) tank	1
05	control panel	1
06	aration blower	1
07	level sensor (high & low)	1
08	sight glass	1
09	manhole	2
10	sludge discharge pump	1
11	clean water discharge pump	1
12	chemical pump	1
13	bacillus inlet pump	1
15	air vent	2
16	high level sensor (emergency)	1
17	air nozzle	1
18	drain globe valve	1
19	return globe valve	1
20	discharge solenoid valve	1
30	chemical tank	1
35	inlet pipe	1
40	common bed	1

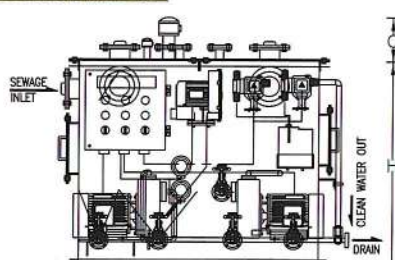
Sizing, design

The Han young system was developed as a modular system of four basic sizes for purification of waste water from 10, 35, 100 and 125 people. However we are ready to produce individual solutions for any other request. The bioreactor is produced from stainless steel AISI 316Ti as standard. The bioreactor from other materials is as well possible after a consultation. The Han young Marine units are equipped by electric components 400 W 460 volts, 50 or 60 Hz.

PLAN VIEW



ELEVATION VIEW



SPECIFICATIONS

MODEL	HYSTM-10	HYSTM-15	HYSTM-25	HYSTM-35	HYSTM-45	HYSTM-60	HYSTM-80	HYSTM-100	HYSTM-125
PERSONS	10	15	25	35	55	60	80	100	125
CAPACITY 1/DAY	1850	2775	4625	6475	10175	11100	14800	18500	23125
W (mm)	850	860	940	1050	1150	1360	1520	1680	1890
L (mm)	1500	1580	1680	1680	2150	2300	2300	2400	2680
H (mm)	1000	1125	1580	1650	1990	2000	2300	2300	2300
O (mm)	300	300	300	300	300	300	300	300	300
P (mm)	500	500	500	500	500	600	600	600	600
TOTAL WEIGHT(kg)	DRY 630	680	890	920	1180	1200	1400	1700	1950
	OPERATION 1010	1050	2876	4430	6030	7200	7800	8100	8750

DISCHARGE PUMP

MODEL	HYSTM-10	HYSTM-15	HYSTM-25	HYSTM-35	HYSTM-45	HYSTM-60	HYSTM-80	HYSTM-100	HYSTM-125
CAPACITY (m ³ /hr)	8	8	8	8	8	8	8	8	8
TOTAL HEAD (m)	20	20	20	20	30	30	30	30	30
MOTOR (KW)	1.0	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5
POWER SOURCE	AC220/380/440V, 3φ, 50/60Hz								

BLOWER

MODEL	HYSTM-10	HYSTM-15	HYSTM-25	HYSTM-35	HYSTM-45	HYSTM-60	HYSTM-80	HYSTM-100	HYSTM-125
CAPACITY (m ³ /hr)	90	90	90	90	90	180	180	180	180
PRESSURE (kgf/cm)	1.3	1.3	1.3	1.3	1.3	1.8	1.8	1.8	1.8
MOTOR (KW)	0.5	0.5	0.5	0.5	0.5	0.75	0.75	0.75	0.75
POWER SOURCE	AC220/380/440V, 3φ, 50/60Hz								

OUR PRODUCT RANGE



2/3 Pneumatic Cylinder valve
(PT 3/8" ~1")



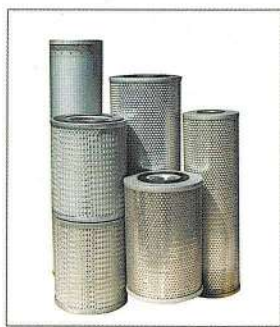
2/3 Cylinder valve
(5K(10K) -15A~65A)



Electric solenoid valve
(PT 3/8" ~2")



Safety & Relief valve
(PT 1/2" ~3")



Coalescer & NF filter for
15ppm Bilge Separator



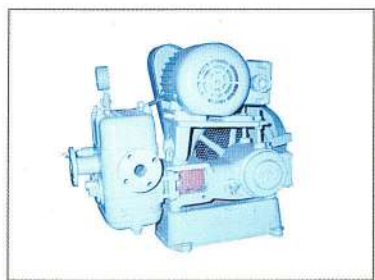
Electric Heater
Device



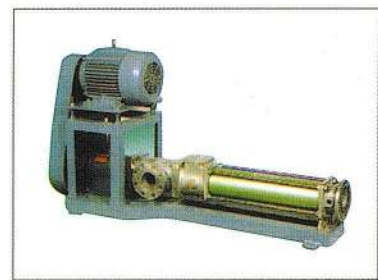
Level Sensor



Recirculating
Facilities Manual Valve
(5K-15A~65A)



Bilge Piston Pump
Capacity
(0.15~30 m³/h)



Sludge Mono Pump
Capacity
(1.0~30 m³/h)