



U. S. Department of Homeland Security United States Coast Guard Certificate of Approval

Coast Guard Approval Number: 159.015/10224/0

Expires: 24 April 2023

SEWAGE POLLUTION PREVENTION EQUIPMENT
CERTIFICATION OF COMPLIANCE WITH 33 CFR 159 - Type II Marine Sanitation Device

SHS TECH, LLC
POB 53241
Lafayette LA 70505-3241

Models SHS I-P-40 (160 GPD) and I-P-70 (200 GPD)

This is to certify that the models listed above, having a designed hydraulic loading of 0.61 and 0.76 m³/day, an organic loading of 0.45 and 1.09 kg/day biochemical oxygen demand, and of the design shown on drawing Nos. SHTS-M001 Rev. 3 dated February 14, 2018, and SHST-0004 Rev. A dated July 2017, have been examined and satisfactorily tested in accordance with IMO Resolution MEPC.227(64) to meet the operational requirements referred to in regulation 9 of Annex IV of the International Convention for the Prevention of Pollution from Ships (MARPOL).

The tests on the equipment were carried out ashore at TEi-Testing Services, LLC, and completed on November 6, 2017. The equipment was tested and produced an effluent which, did not exceed the geometric mean of 100 thermotolerant coliforms per 100 mL, total suspended solids of 35 mg/L, a geometric mean of 5-day biochemical oxygen demand (BOD) without nitrification of no more than 25 Qi/Qe mg/l, a geometric mean of chemical oxygen demand (COD) of no more than 125 Qi/Qe mg/l, and a pH between 6 and 8.5; a geometric mean of total nitrogen of no more than 20 Qi/Qe mg/l or at least 70 percent reduction, and a geometric mean of total phosphorus of no more than 1.0 Qi/Qe mg/l or at least 80 percent reduction.

For U.S. vessels, the models listed above have not been shown to meet 46 CFR 111.105 and may not be installed in hazardous locations as defined in National Fire Protection Association (NFPA), National Electric Code (NEC) 2002 (NFPA 70), and in International Electrotechnical Commission (IEC) 60079-0. The Administration is satisfied that the sewage treatment plant can operate at angles of inclination of 22.5 degrees in any plane from the normal operating position.

Details of tests and results obtained are shown on the appendix to this Certificate.

A copy of this certificate should be carried on board any ship equipped with the above described sewage treatment plant.

*** End ***

THIS IS TO CERTIFY THAT the above named manufacturer has submitted to the undersigned satisfactory evidence that the item specified herein complies with the applicable laws and regulations as outlined on the reverse side of this Certificate, and approval is hereby given. This approval shall be in effect until the expiration date hereon unless sooner canceled or suspended by proper authority.

GIVEN UNDER MY HAND THIS 24th DAY OF
APRIL 2018, AT WASHINGTON, D.C.

C. J. ROBUCK
Chief, Engineering Division
BY DIRECTION OF THE COMMANDANT



TERMS: The approval of the item described on the face of the Certificate has been based upon the submittal of satisfactory evidence that the item complies with the applicable provisions of the navigation and shipping laws and the applicable regulations in Title 33 and/or Title 46 of the Code of Federal Regulations. The approval is subject to any conditions noted on this Certificate and in the applicable laws and regulations governing the use of the item on vessels subject to Coast Guard inspection or on other vessels and boats.

Consideration will be given to an extension of this approval provided application is made 3 months prior to the expiration date of this Certificate.

The approval holder is responsible for making sure that the required inspections or tests of materials or devices covered by this approval are carried out during production as prescribed in the applicable regulations.

The approval of the item covered by this certificate is valid only so long as the item is manufactured in conformance with the details of the approved drawings, specifications, or other data referred to. No modification in the approved design, construction, or materials is to be adopted until the modification has been presented for consideration by the Commandant and confirmation received that the proposed alteration is acceptable.

NOTICE: Where a manufacturer of safety-at-sea equipment is offering for sale to the maritime industry, directly or indirectly, equipment represented to be approved, which fails to conform with either the design details or material specifications, or both, as approved by the Coast Guard, immediate action may be taken to invoke the various penalties and sanctions provided by law including prosecution under 46 U.S.C. 3318, which provides:

"A person that knowingly manufactures, sells, offers for sale, or possesses with intent to sell, any equipment subject to this part (*Part B. of Subtitle II of Title 46 U.S.C.*) and the equipment is so defective as to be insufficient to accomplish the purpose for which it is intended, shall be fined not more than \$10,000, imprisoned for not more than 5 years or both."

APPENDIX
U. S. Coast Guard Approval Number: 159.015/10224/0
Expires: April 24, 2023

TEST DATA AND RESULTS OF TESTS CONDUCTED ON SAMPLES FROM THE SEWAGE TREATMENT PLANT IN
ACCORDANCE WITH IMO RESOLUTION MEPC.227(64)

Sewage Treatment Plant, Type II Marine Sanitation Device

Manufactured by: SHS Tech, LLC

Organization conducting the test: TEi Testing Services/Models I-70 and I-1000, Report Number TS-P1701012 dated November 6, 2017

	<u>I-70</u>	<u>I-1000</u>
Designed hydraulic loading:	.76 m3/day	3.79 m3/day
Designed organic loading:	1.09 kg/day BOD	4.08 kg/day BOD
Number of effluent samples tested:	40	40
Number of influent samples tested:	40	40
Raw sewage (influent) quality:	612 mg/l Total Suspended Solids	612 mg/l Total Suspended Solids
Maximum hydraulic loading:	.38 m3/day	1.90 m3/day
Minimum hydraulic loading:	.076 m3/day	.379 m3/day
Average hydraulic loading:	.152 m3/day	.758 m3/day
Total Nitrogen influent quality:	16.6 mg/l	16.6 mg/l
Total Phosphorus influent quality:	9.7 mg/l	9.7 mg/l
Dilution Compensation Factor (Qi/Qe):	1.0	1.0
Geometric Mean of Total Suspended Solids:	4.0 mg/l	5.0 mg/l
Geometric Mean of the Thermotolerant Coliform Count:	4 tcu/100 ml	3 tcu/100 ml
Geometric Mean of BOD5:	6.1 mg/l	5.9 mg/l
Chemical Oxygen Demand (COD):	21 mg/l	19 mg/l
Geometric mean of total nitrogen:	0.96 mg/l or 94.2% reduction	1.03 mg/l or 93.8% reduction
Geometric mean of total phosphorus:	0.18 mg/l or 98.1% reduction	0.18 mg/l or 98.1% reduction
Maximum pH:	7.6	7.6
Minimum pH:	6.8	6.8
Type of disinfectant used: Chlorine		
If Chlorine – Residual Chlorine:		
Maximum:	0.6 mg/l	0.6 mg/l
Minimum:	0.1 mg/l	0.1 mg/l
Geometric Mean:	0.3 mg/l	0.3 mg/l
Was the sewage treatment plant tested with:		
Fresh Water flushing?	Yes	Yes
Salt Water flushing:	No	No
Fresh and Salt Water flushing:	No	No
Greywater added:	Yes	Yes
Proportion of Greywater:	20% Black to 80% Grey Water	20% Black to 80% Grey Water
Was the sewage treatment plant tested against the environmental conditions specified in section 5.0 paragraph 5.9 of resolution MEPC.227(64):		
Temperature:	Yes	Yes
Humidity:	Yes	Yes
Inclination:	Yes	Yes
Vibration:	Yes	Yes
Reliability of Electrical and Electronic Equipment:	Yes	Yes
Limitations and the conditions of operation are imposed:		
Salinity:	N/A	N/A
Temperature:	N/A	N/A
Humidity:	N/A	N/A
Inclination:	N/A	N/A
Vibration:	N/A	N/A

*** END ***