EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate no.:
MEDB00008Y5

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as “Forskrift om Skipsutstyr” by the Norwegian Maritime Authority. This Certificate is issued by DNV AS under the authority of the Government of Norway.

This is to certify:

that the Sewage systems

with type designation(s)
STD series sewage treatment models: STD-1, STD-2, STD-3, STD-4, STD-5, STD-6, STD-8, STD-10, STD-15, STD-20

issued to
CSSC Nanjing Luzhou Machine Co.,Ltd
Nanjing, Jiangsu, China

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2023/1667,**
item No. MED/2.6b Marpol 73/78 as amended, Annex IV Regulation 9, IMO Res. MEPC.227(64) excluding section 4.2.

Manufacturers authorised representative
TeamTec AS
Tvedestrand, Norway

Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2029-09-01**.

Issued at **Høvik** on **2024-09-02**

DNV local unit:
Nanjing NB & CMC

Approval Engineer:
Anna Piotrowska

Notified Body
No.: **0575**

for **DNV AS**

Christine Mydlak-Röder
Head of Notified Body

NORWEGIAN ACCREDITATION PROD 019

The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer’s Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.
This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV AS of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.
Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.

Product description

The STD Series provide a biological and chemical disinfection to treat the wastewater produced by the ship. In principle, the incoming sanitary sewage is led to the aeration compartment, where it is digested by aerobic bacteria and microorganisms, promoted by the addition of atmospheric oxygen. The air is supplied to the aeration diffusers by air compressor.
The second stage of the treatment is a settling compartment, where the produced fluid is led to the next chamber, a chlorine contact compartment. The effluent is discharged using the discharge pump. At the suction of the discharge pump, the de-chlorination chemical is dosed to remove residual chlorine content in the treated effluent prior to discharge overboard or to shore connections.

Application/Limitation

Application:

MBR Model	Designed hydraulic loading (m^3/day)	Designed organic loading BOD_5 (kg/day)
STD-1	1.05	0.53
STD-2	2.10	1.05
STD-3	3.15	1.58
STD-4	4.20	2.10
STD-5	5.25	2.63
STD-6	6.30	3.15
STD-8	8.40	4.20
STD-10	10.50	5.25
STD-15	15.75	7.88
STD-20	21.00	10.5

Limitation:

Ambient temperature (°C)	0 – 55 °C
Relative humidity	≤ 95%
Inclination range	0 - 22.5°
Power supply	380 – 440 V, 50/60 Hz
Salinity	≤ 35000 mg/l
Sewage water temperature	2 – 32 °C

The STD series of sewage treatment plant is for use by all type of ships or offshore units for the treatment of sewage in accordance with resolution MEPC.227(64), excluding for the use by passenger ships when operating in special areas as defined by the MARPOL Annex IV.

Chlorination and de-chlorination shall be in accordance with the procedures described in the ‘‘Instruction MANUAL for STD Series Sewage Treatment Plants’’.

The equipment is not permitted to be installed in spaces subject to explosion hazards.

The ship should have on board at all times a copy of the Operation and Maintenance Manual listed in ‘Type Examination documentation’.

Type Examination documentation

Mechanical and Assembly Drawings:

Drawing Title	Drawing Number	Revision (date)
Assembly drawing STD-1 marine sewage treatment plant (*)	W3112(X)-00	0 (2024-03-05)
Assembly drawing STD-2 marine sewage treatment plant (*)	W3113(X)-00	0 (2024-03-05)
Assembly drawing STD-3 marine sewage treatment plant (*)	W3114(X)-00	0 (2024-03-05)
Assembly drawing STD-4 marine sewage treatment plant (*)	W3115(X)-00	0 (2024-03-05)
Assembly drawing STD-5 marine sewage treatment plant (*)	W3116(X)-00	0 (2024-03-05)
Assembly drawing STD-6 marine sewage treatment plant (*)	W3117(X)-00	0 (2024-03-05)
Assembly drawing STD-8 marine sewage treatment plant (*)	W3118(X)-00	0 (2024-03-05)
Assembly drawing STD-10 marine sewage treatment plant (*)	W3119(X)-00	0 (2024-03-05)
Assembly drawing STD-15/20 sewage treatment plant (*)	W3120(X)~W3121(X)-00	0 (2024-03-05)
Assembly drawing STD-1~STD10 marine sewage treatment plant (**)	W3112~W3119-00	0(2024-03-05)
Assembly drawing STD-15~20 marine sewage treatment plant (**)	W3120~W3121-00	0(2024-03-05)
Assembly STD type electrical control box	Q1327B-00	0 (2024-03-27)

* with a vortex air compressor
** with a sliding vane air pump

Piping and Instrumentation Drawings:

Drawing Title	Drawing Number	Revision (date)
System flow diagram STD-1~20 marine sewage treatment plant	W3112-W3121-00LC	0 (2024-03-05)

Electrical and Instrumentation Drawings:

Drawing Title	Drawing Number	Revision (date)
Electrical schematic diagram STD type electrical control box	Q1327B-00YL	0 (2024-03-27)

Operation and Maintenance Manuals:

Drawing Title	Drawing Number	Revision (date)
Instruction MANUAL for STD Series Sewage Treatment Plants	W3112~W312100SM	0 (2024-03-05)
Instruction Manual Electrical Control Box for STD series	Q1327B 00SM	0

Tests carried out

Performance Tests:

- Test Location: CSSC Nanjing Luzhou Machine Co., Ltd; Nanjing, China
  Test report: SHE13-00575 dated 2013-07-19
  Issued by SGS-CSTC Standards Technical Services (Shanghai) Co. Ltd Testing Center
  Date of testing: 2013-05-08 - 2013-05-21
  Testing witnessed by China Classification Society (CCS)

Environmental Tests:

- Test Location: China Shipbuilding Industry Environment and Reliability Test Centre for Electric and Electronic Equipment
  Test Report: ER 2013-039 dated 2013-07-28
  Issued by China Shipbuilding Industry Environment and Reliability Test Centre for Electric and Electronic Equipment
  Date of testing: 2013-07-10 - 2013-07-15

Marking of product

For traceability to this EC Type-Examination, each unit to be marked with:

- Manufacturer's name or trademark
- Type designation
- Serial number
- Designed Hydraulic Loading, and any other operational or installation limits considered necessary by the manufacturer or the Administration
- Mark of Conformity

A copy of this Certificate should always be carried aboard a vessel, when fitted with this sewage treatment plant.

Revision history

Revision	Date of issuance	Description
0	2024-09-02	Initial certificate

APPENDIX A – Summary of test results for STD-2

Test results and details of tests conducted on samples from the sewage treatment plant in accordance with IMO Resolution MEPC.227(64), excluding section 4.2 for Passenger Ships in Special Areas:

Sewage treatment plant type:	**STD-2**
Manufactured by:	**CSSC Nanjing Luzhou Machine Co., Ltd;**
Organization conducting the test:	**China Shipbuilding Industry Environment and Reliability Test Centre for Electric and Electronic Equipment,**
Organization handling the samples:	**SGS-CSTC Standards Technical Services (Shanghai) Co. Ltd Testing Center**
Test Location:	**CSSC Nanjing Luzhou Machine Co., Ltd, Xinjian, Zhonghuamenwai, Nanjing, China;** **China Shipbuilding Industry Environment and Reliability Test Centre for Electric and Electronic Equipment, NO. 166 Linjiang Road. Yangzhou, Jiangsu Province, China**
Designed hydraulic loading:	**2.10 m^3/day**
Designed organic loading:	**1.05 kg/day BOD_5**
No. of effluent samples tested:	**44**
No. of influent samples tested:	**11**
Total suspended solids influent quality:	**827 mg/l**
Total nitrogen influent quality: - Geometric mean: - Maximum - Minimum	 **N/A** **N/A** **N/A**
Total phosphorus influent quality: - - Geometric Mean: - - Maximum: - - Minimum:	 **N/A** **N/A** **N/A**
BOD_5 without nitrification influent quality:	**702 mg/l**
Maximum hydraulic loading:	**2.165 m^3/day**
Minimum hydraulic loading:	**2.09 m^3/day**
Average hydraulic loading (Qi):	**2.13 m^3/day**
Effluent flow (Qe):	**2.13 m^3/day**
Dilution compensation factor (Qi/Qe):	**1**
Geometric mean of total suspended solids:	**5.95 mg/l**
Geometric mean of the thermotolerant coliform count:	**1 coliforms/100 ml**
Geometric mean of BOD_5 without nitrification:	**2 mg/l**
Geometric mean of COD:	**28 mg/l**

Geometric mean of total nitrogen:	
Percentage reduction of total nitrogen:	**N/A**
Geometric mean of total phosphorus:	
Percentage reduction of total phosphorus:	**N/A**
Maximum pH:	**7.5**
Minimum pH:	**7.1**
Type of disinfectant used:	**Sodium hypochlorite (NaClO)**
If Chlorine - residual Chlorine:	
Maximum:	**0.13 mg/l**
Minimum:	**0.02 mg/l**
Geometric mean:	**0.03 mg/l**

Was the sewage treatment plant tested with:

Fresh water flushing?	**Yes**
Salt water flushing?	**Yes**
Fresh and salt water flushing?	**Yes**
Grey water added?	**No**

Was the sewage treatment plant tested against the environmental conditions specified in section 5.9 of Resolution MEPC.227(64):

Temperature:	**Yes**
Humidity:	**Yes**
Inclination:	**Yes**
Vibration:	**Yes**
Reliability of Electrical and Electronic Equipment:	**Yes**

Limitations and the conditions of operation are imposed:

Salinity:	**≤ 35000 mg/l**
Temperature:	**0 – 55 °C**
Humidity:	**≤ 95 %**
Inclination:	**0 - 22.5 °**
Vibration:	**As test criteria specified by Test Report: ER 2013-039**

Results of other parameters tested: **N/A**